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Symposium

Science and Theology: New Challenges and Perspectives

The Eleventh Ecumenical Theological Symposium

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Science and Theology: New Challenges and Perspectives

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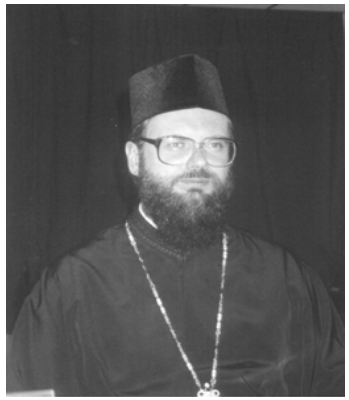

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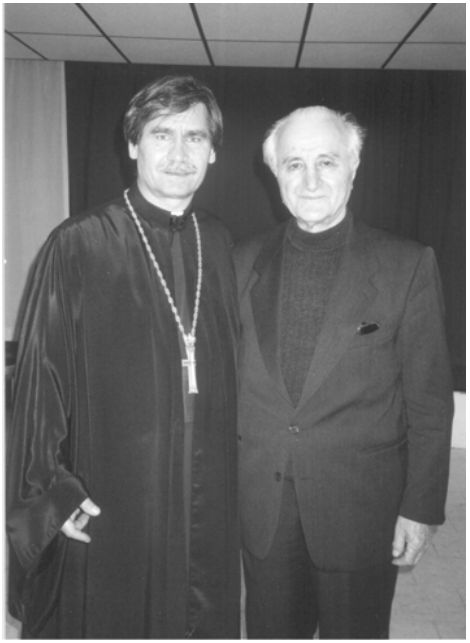

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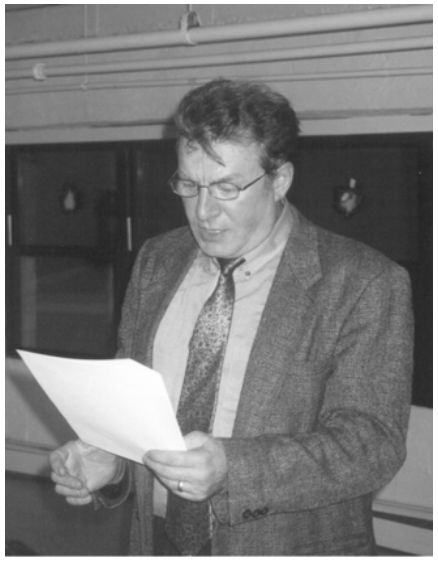


Prof. Mircea Săndulescu

Fr. Dr. Paul E.C. Hamilton

GEORGE ALEXE

The 11th Ecumenical Theological Symposium Introductory Remarks

Your Eminence Archbishop Nicolae,
V. Rev. Father President, Dr. Theodor Damian,
Very Reverend Clergy and Fathers,
Distinguished Speakers and Guests,
Ladies and Gentlemen,

Last year we celebrated the 10th anniversary of our Ecumenical Theological Symposium, under the patronage of the Romanian Institute of Orthodox Theology and Spirituality in New York. It was a symbolic event commemorating its spiritual and cultural achievements. I assume that our experience over the past ten years might be much more than a matter of introduction to our 11th Ecumenical Theological Symposium. Certainly, to continue such a noble activity with the same determination, as we did in the first decade, will be, for all of us, a distinctive matter of honor and a moral duty.

When it comes to the topic we have this year, in order to adequately understand science and religion in our changing world, new spiritual means must be found. In a sense, the Ecumenical Theological Symposium, will deeply explore many new theological, philosophical and scientific aspects of the dialogues between science and religion, in order to become one more voice that calls for the salvation of the culture and civilization of our western world from its inner dissolution and disintegration. In this somber context, we consider the theandric way as being a valid way of salvation. Because in our opinion, only this way is theologically capable of contemplating, confronting and harmonizing the new challenges and perspectives, which certain sciences and theologies of our times are trying to legitimize by themselves: their ill-founded, postmodern existence.

Of course, the general topic of the 11th Ecumenical Theological Symposium is justified by itself. Never in their histories have science and theology played such an important role as in our contemporary life. In fact, we are facing new scientific and theological challenges and perspectives, which strongly dominate the postmodern era. Already, in the middle of the last century, William F. Buckley Jr. emphasized the encroachments of secular perspectives on learning. He stressed the importance of conventional Christianity by denouncing "... a physical war against Christian civilization, and an intellectual war against the foundations of our spiritual faith."[1] Since then, especially since the apparition of the New Age Movement, the traditional relationship between theology, science and philosophy has been changed. The alarming admixture of religious, scientific and philosophical factors suggests a spiritual precipitation which is taking place in our time, rather than a postmodern syncretistic coalition. We do not yet know what the result of this spiritual precipitation will be. Waiting for that result, we may underscore some of the new and promising expectations. As Martin Palmer affirms, "Whereas in the recent past, religious thought had to keep adapting in order to absorb new scientific ideas, now science is beginning to look into the metaphysics of religion for suitable or complementary models or images."[2] As Martin Palmer put it, (these) "new ways of thinking combined with a certain humility is what is making the contemporary engagement between religion and science so fascinating."[3] Without anticipating a conclusion, it is useful to hear what Paul Tillich had to say about this topic: "Science can conflict only with science, and faith only with faith; science which remains science cannot conflict with faith which remains faith. This is true also of other spheres of scientific research, such as biology and psychology."[4]

To our surprise, in the first quarter of the 20th century, physicists found a better model for the physical world based on the theory of relativity and the quantum theory. Briefly, according to their new discoveries, there is a closer connection between science and mysticism than with materialism. It may seem

bizarre, but in the opinion of Paul Davies "science offers a surer path to God than religion."[5] So, we have to acknowledge the very fact that there are many theological and scientific temptations and challenges, which need to be taken into consideration, commented upon and answered by the postmodern scientists, theologians and philosophers.

Naturally, our Symposium is greatly committed to making a contribution to this noble task. The papers presented this afternoon by our distinguished speakers will emphasize the main aspects of the general topic "Theology and Science: New Challenges and Perspectives."

I would like to particularly acknowledge our guests and speakers, who come from the Romanian Archdiocesan Center in Chicago, from the Metropolitan College of New York, Hunters College of CUNY, University of Bucharest, and the Romanian Institute of Orthodox Theology and Spirituality. Each of them are contributing to the success of the 11th edition of the Ecumenical Theological Symposium. Their papers discuss various and thoughtful topics, such as:

Postmodern Science and Theology: New Scientific Temptations and Challenges versus Ecumenical and Theological Perspectives,
Science and Religion: The Role of Consciousness in the Universe,
Science and Religion: Antagonism or Complementarity,
Religion and Contemporary Science as Quest,
The Great Flood: Myth or Reality,
Science and Religion:The Transcendent Ground of Order, and
Linguistic Contributions to the Understanding of the Early Christian Lexicon of the Romanian Language.

Very Rev. Prof. Dr. Paul E.C. Hamilton, of the Episcopal Church of the USA, will be our Guest of Honor, and Prof. Mircea Săndulescu will moderate the presentation of the papers of our distinguished speakers.

Following the presentation of the papers, we will take a break during which you are kindly invited to a delicious dinner prepared and served by the Ladies Committee of "SS. Peter and Paul" Church which together with St. Paul's Episcopal Church is the host of our event. After the break we will reconvene for discussion.

Before closing my introductory remarks, it is my privilege to acknowledge the messages of hierarchical blessings, best wishes and success of the 11th Ecumenical Theological Symposium, sent to us by His Beatitude Teoctist, the Patriarh of the Romanian Orthodox Church, and of other bishops and friends of our Institute.

Finally I would like to acknowledge the Founder and President of the Romanian Institute of Orthodox Theology and Spirituality, the Rev. Prof. Dr. Theodor Damian, Mrs. Preoteasa Claudia Damian and all their devoted co-workers and supporters, and to extend to them our best wishes for future accomplishments, by using the old Latin words of our ancestors: *Vivat, Crescat, Floreat!* Thank you and welcome.

NOTES:

1. William F. Buckley Jr., See: "The Trojan Horse of American Education? A Bacalaureate Address at St. Joseph's College;" Collegeville, Ind. June 8, 1952; in his book: *Let Us Talk of Many Things*, The Collected Speeches, Forum An Imprint of Prima Publishing, Roseville, CA 2000, p. 12.

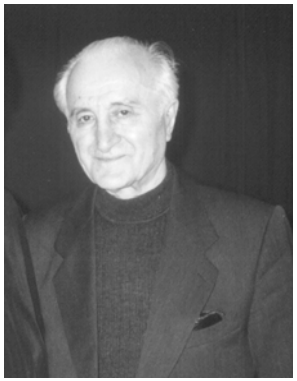
2. Martin Palmer, *Coming of Age. An Exploration of Christianity and the New Age*, Aquarian/Thorsons, An Imprint of Harper Collins Publishers, Hammersmith, London, 1993, p. 161.

3. *Ibidem.*

4. Paul Tillich, *Dynamics of Faith*, First Harper Torchbook edition, New York, 1958, pp. 82-83.

5. Paul Davies, *GOD and the New Physics*, Simon and Schuster, New York, 1983, pp. VII and IX.

GEORGE ALEXE



Postmodern Science and Theology: New Scientific Temptations and Challenges Versus Ecumenical and Theological Perspectives

As a theologian concerned with the Divine truth in Eastern Orthodox Theology, I would like to emphasize in what follows, a possible correlation between the various forms of truth in the so called post-modern religion, philosophy and science. Certainly, the unity of the divine truth on which the spiritual order of the world is transcendentally grounded, has to be understood as the ultimate concern proclaimed by the actual plurality of religions and multitude of philosophical and scientific conceptions.

Regrettably, this ontological unity of the world appears to be now, more than ever, broken and fragmented. Instead of being reduced by theological, philosophical and scientific means, this fragmentation seems to be increasing ad infinitum.

Urgent questions arise: What must be done to stop the proliferation of this fragmentation of the divine truth and the spiritual order of the world? What is the better way to approach these new scientific challenges versus the ecumenical and theological perspectives?

One answer may be found in the paternal message addressed to our Symposium by His Beatitude Theoctist, Patriarch of Romania. According to His Beatitude, the dialogue between science and religion is more necessary now, because the alienation from God, excessive rationalism and the astonishing progress of scientific knowledge tend to place mankind on the throne reserved only to God the Pantocrator, by ignoring the truth revealed to us by the psalmist: “The heavens declare the glory of God; the skies proclaim the work of his hands” (Psalm 19:1).

A dialogue between religion and science must be philosophically, theologically or scientifically moderated, based on the profound knowledge of the divine truth, in its ontological unity with the physical and spiritual order of the world, as it was recognized in the biblical times and equally proclaimed by Holy Scripture. It is well known that during past ages, all the relations between faith and reason, so to speak, between religion and science were friendly or unfriendly depending on the influence of the dominating spirit of that respective period of time. For example, the Middle-Ages (VIII-XVI centuries) were dominated by faith and reason, characterized by the intellectual efforts to create permanent accords in order to harmonize reason with faith, and science and philosophy with religion, naturally in the predominant spirit of medieval Renaissance and humanism.

Therefore, the Modern Age (XVI-XX centuries) has been philosophically dominated by materialism, rationalism and illuminism and then theologically by western scholasticism, modernism, liberalism, deism and atheism, especially by the anthropocentrism and theocentrism, in the spirit of the French Revolution, that temporarily enthroned the cult of the Supreme Reason. And finally, as a tragic culmination not to be forgotten, has been the modern predominance of the evil spirit of the racist and totalitarian ideologies of fascism and communism that gravely affected both the Western and Eastern European culture and civilization. Under the anthropocentric influence and inspiration of this modern spirit along with its unprecedented totalitarian consequences, the traditional relations between religion, philosophy and science were almost totally deteriorated and pushed to the edge of condemning each other without any mercy.

Which is the predominant spirit of the postmodern age? We have to admit that in the actual circumstances it is very difficult to find a satisfactory definition. As you undoubtedly know, our topic is dealing with a lot of postmodern problems to be solved and many questions to be answered. Among them, the most important are the new relations created between science, religion, and philosophy. We consider that the new scientific temptations

and challenges versus the ecumenical and theological perspectives, originate from here, being anthropocentrically dominated by the yet unknown spirit of the postmodern age.

The old medieval controversies between faith and reason, theology and philosophy, or all together between science, philosophy and theology have erupted again, and this time more aggressively, in the renewed anthropocentric spirit of the postmodern age. There appears to be, more or less civilized, a real *Lucifer match* for supremacy, led by the post modern anthropocentric science and philosophy against religion and God.

In spite of their biblical spirit and roots, science and philosophy, once considered as being the *ancilla theologiae*, in present, both of them are apparently associated in searching for legitimizing their anthropocentric truth against the divine truth of theology. In fact, they are against the unity and spiritual order of the whole world. Certainly, we are aware of the Christian limitations marking the boundaries of postmodern anthropocentric science and philosophy. Further, we are making a clear distinction between the postmodern scientists and philosophers and the Christian scientists and philosophers who are promoting the genuine spirituality of true science and philosophy, based on the truth of the divine revelation.

It has been said that science and faith based on reason are the two eyes through which man looks at ephemeras and eternity, and this is true. According to the fundamental theology of the Eastern Orthodox Church, a conflict between true faith and reason or between true religion and science, is not possible from any point of view. As Paul Tillich has demonstrated, science can conflict only with science, and faith only with faith; science which remains science cannot conflict with faith which remains faith. This is true also of other spheres of scientific research, such as biology and psychology.[1]

The conflicts between religion and science usually take place among the false representatives of science and religion, or between the pseudo-scientists and pseudo-believers. Without ignoring these conflicts, what we have to bear in mind is the truth

that science may eventually change the relation between man and nature, but can never change the relationship between man and God. In this respect, Karl Jaspers has clearly pointed out the limits of scientific knowledge. According to him: “La connaissance scientifique des choses n’est pas une connaissance de l’être…La connaissance scientifique ne saurait donner à l’homme le but de son existence… La science ne peut répondre à la question de sa propre signification…” [2]

Clearly, one may support or contest the existence of the following autonomous disciplines: philosophical science, philosophical theology, scientific theology, scientific philosophy, theological science, and theological philosophy. However, all these specific denotations, conflicting or competing among themselves, cannot transcend the limits of their scientific knowledge.

We may emphasize the interdisciplinary relationship between philosophy, science and religion, as it was creatively analyzed by Nicholas Berdyaev. He rightly said that both religion and science may enrich philosophical knowledge from within, but they must not dominate it from without. Philosophy has been expected to conform either to theology or to science and even to mathematical physics. But philosophy, emancipating itself from the crushing power of theology, fell into a worse type of slavery: to autocratic and despotic science. Philosophy cannot be reduced to science or religion. It is a special domain of spiritual culture, different from, but standing in complex and intimate relations with science and religion.[3]

Nevertheless, in order to better understand the western postmodern scientific temptations versus ecumenical and theological perspectives, it is also necessary to underline the relations between theology, science, and philosophy from the standpoint of the Eastern Orthodox Church. Not having any modern or postmodern philosophic or scientific preference, the Orthodox Church is always free to approach philosophy and science with more freedom by apologetically using them. The Church will never defend their relative and changing philosophic

and scientific truths, as it will always be defending the unchanged divine truth of her dogmas. That is why the old and modern cosmological teachings will never affect in any way the fundamental truth of the created cosmos revealed to the Church.[4]

True science is based on the rationality of the world created by God. Scientists and philosophers are discovering this rationality of the created world by their own methods, while theologians know this Divine rationality through the natural and supernatural revelation. This kind of rationality does not belong to science or philosophy, and was not created by science and philosophy or even by theology. It was created by God. That is why in the Eastern Orthodox Church, philosophy and science are apologetically appreciated, while their relative and changeable truths will never be dogmatized or condemned. This Orthodox theological equilibrium between religion and science, natural and supernatural, or between God and man, is based on the theandric communion of God with man in the person of our Lord Jesus Christ, and has ironically avoided any direct or major conflict between religion, science and philosophy.

But this can only happen up to a point. As William F. Buckley Jr. has said, "we are living in a turbulent and confusing and perverse world situation, because so many have forgotten the lessons of Christ and because so many men have turned their back on Him, seriously threatens the international ascendancy of evil: a physical war against Christian civilization, and an intellectual war against the foundations of our spiritual faith".[5]

Since it has been denounced by William F. Buckley Jr. in June of 1952, this American situation has been enduring the entire modern age. Now, in the so called postmodern age, the situation is totally different. Christianity is enduring the offensive of the new postmodern science and philosophy, especially under the umbrella of the New Age Movement and the new world order of the economical and political globalization.

Already, the Roman Catholic Church and its theology are infiltrated by the New Age Movement, particularly in the USA. The Catholic involvement in the New Age Movement is critically

analyzed by Prof. Mitch Pacwa S.J., by strongly denouncing the contradictions perpetrated by this strange movement and its scientific, philosophical and theological errors.[6]

Also, the Protestant world has been invaded by the New Age Movement. David K. Clark and Norman L. Geisler, Evangelical apologists, have clearly demonstrated the religious danger of pantheism for Christians and for the American culture, because the philosophy, theology, and science are now pantheistically interpreted in the light of the dominant spirit of the New Age Movement, the Space Age and the Globalization.[7]

Taking into consideration the new postmodern circumstances created by the New Age Movement, Space Age and Globalization, we have to concede that they are insinuatingly constituting the new scientific temptations and challenges to be included or accepted in our religion and Christian life, without any other alternatives. That is why we consider that now is the proper time to seriously debate them, in order to accept or eliminate them from our Christian life. Certainly, until is not too late.

Lastly, Paul Davies, the author of *Other Words* and *The Edge of Infinity,* in his interesting book *God and the New Physics* (Simon and Schuster, New York, 1983) is looking at some of the very latest discoveries in fundamental science to explore their implications for religion. He criticizes the world's major religions that are founded on received wisdom and dogma, being rooted in the past and not easily coping with the changing times. The decline of religion is not because science has finally won its age-old battle with religion, he said, but because science has so radically reoriented our society that the biblical perspective of the world now seems largely irrelevant. Western Christianity is now confronted, and some times humiliated, by postmodern science and its scientific philosophy and especially by its new "scientific religions".

Unfortunately, Paul Davies has no idea of Eastern Orthodox Christianity and its patristic roots about the traditional relations created during the ages between religion, science and philosophy. According to the Eastern Orthodox Tradition, there

are no internal contradictions in the Holy Scripture or between the religious truth and that of all sciences and philosophies, in spite of so many scientific, philosophical and theological realities and various interpretations of our time. However, there are many phenomenal complexities associated with emotional disturbances that are complicated by unreasonable prejudices and misinterpretations of the normal equilibrium between theology, philosophy and science. It is enough to mention here the profound analysis made by Nicolas Berdyaev on truth and falsehood in religion, science and philosophy.[8]

It seems to be strange, but in reality it is true. What was unbelievable yesterday is morally accepted as believable today. In the words of Berdyaev: "The religious life of mankind, and perhaps of Christendom in particular, is permeated with falsity. Falsity has received an almost dogmatic significance." [9] Certainly, he is not referring here to the external falsity which is obvious and easily condemned, but to the inner, hidden falsity, falsity to oneself and to God which eludes detection and comes to be regarded as a virtue. And Berdyaev concludes: "There is a kind of falsity which is considered a moral and religious duty, and those who reject it are said to be rebels. There exist social accumulations of falsity which have become part of the established order of things."[10] More than that, "Falsity is pragmatically justified, while truth is often regarded as dangerous and harmful." [11]

In this social framework of a "conventional falsity", where should our focus be related to the new scientific temptations and challenges of postmodern science and theology, considering their ecumenical and theological perspectives? Inside or outside of this almost dogmatized falsity? I suppose that the correct answer has to be: neither inside nor outside of this double falsity.

Obviously, if we are going to effectively establish a sincere dialogue between science, philosophy and theology, then we have to eliminate and eradicate all these conventional lies from our spiritual and social lives, by replacing them with the divine truth. In the first place, we have to denounce the falsehood which

is, according to Berdyaev, morally sanctioned as good. But denouncing all the conventional lies is the most impossible mission in our time, because the "father of lies," the devil (John, 8:44), has created a climate favorable to all kind of conventional lies. Therefore, to find the path of the divine truth and to escape from the devil's falsification of our lives means to return ourselves to God. This also means a net separation from the devil's lies.

Unfortunately, the tragedy of the truth and falsehood in our religious and social life, as it was detected by Nicolas Berdyaev, is still in progress, by monstrously enslaving the postmodern world which we live in.

Far from their biblical sources of being, the secular theology, philosophy and science are blindly trying to find an escape from this postmodern labyrinth of all kinds of conventional lies. They need a new Ariadne to give them the thread of the divine truth to find their way out of this postmodern labyrinth. Without any doubt, the postmodern science, philosophy and theology are infected by conventional lies. Consequently, the new scientific temptations and challenges versus ecumenical and theological perspectives are also gravely affected by these conventional lies. There seems to be no exaggeration if we are going to consider the religious and social falsehood of our lives, depicted by Berdyaev, as being the predominant spirit of the modern and postmodern era. In this consensus of opinion, the sentence of Karl Jaspers: "L'apparition de la science moderne est aussi l'apparition d'une catastrophe,"[12] better be remembered.

Certainly, the struggle against this falsehood never had ceased. For example, Berdyaev has significantly illustrated, among others, the struggle of science for freedom and its consequences. His main paragraph about this struggle, reads:

"Science tries to free itself from conventional lies and preconceived ideas whether they are religious, philosophical, social or national; it seeks for pure, unadorned truth, however bitter truth might be. Such is the great task of science. But what an amount of falsity accumulates round science! A new denomination of Scientism has been created and the greatest

values are sacrificed to the new idol. Men of science struggling against faith, against Christianity, against God, imagine that in doing so they serve truth and justice. The freedom of scientific thought degenerates into freethinking, into a new kind of dogmatism. And this new dogmatism makes use of conventional lies for its own purposes. Academicians, professors, scientists are certainly not the type of men free from preconceived ideas and conventional falsity which is widely used by socially organized science. Scientists stand in superstitious awe of science and frequently prove to be its slaves not its masters. Their judgments do not spring from a free and clear source. There is a conventional public opinion in the world of science, very tyrannical and destructive of the freedom of judgment. The conventional falsity of judgments passed by people of one nationality upon those of another or by members of one class upon those of a different class is known only too well. That falsity has been accumulating in the national and class consciousness for centuries and has come to be regarded as good and true".[13]

Evidently, the struggle of science to anthropocentrically escape from its falsity has been a total failure. Instead of freeing itself from its conventional lies and preconceived ideas, science has finally regarded this conventional falsity as good and true. But this is only a delusion.

A similar false belief persistently considered as being true, has been clearly denounced by Anthony Standen, in his essay "The Limitations of Science." He is firmly stating: "The idea that science is infallible and beyond criticism, is a delusion, and even a dangerous one. The teaching of science only perpetuates this delusion, for it is always taught by scientists, who are busy keeping up with science that they can never look at it from the outside…"[14]

To conclude, I sincerely believe that all these new postmodern scientific and philosophical temptations should be seen as the real challenges for all the theological, philosophical and scientific efforts that normally and logically have to be reoriented to their real ecumenical perspectives, by theandrically

rediscovering their original identity and their divine sources of existence.

However, there is a somber spectrum of postmodern sciences, philosophies and theologies contending each other in contesting or fragmenting the unity of the divine truth. This panoramic view may offer to us a comprehensive understanding of the new postmodern relations between theology, science and philosophy. But these new postmodern relations require also, in the first place, new interrelations and new interpretations, grounded on their original identities and final limitations, that have to be acknowledged by their scientific, philosophical and theological fulfillment, certainly for further spiritual achievements.

It is to be hoped that, as His Beatitude Patriarch Theoctist has clearly mentioned in his message addressed to our Symposium: "If there has to be a Christian dialogue between religion, science and philosophy, to be ecumenically, theologically and scientifically accepted by all, then there has to be a dialog between science and religion in the light of the Holy Fathers, in order to answer all challenges that science in the whole of its complexity is confronting the entirety of Christianity today."

Notes:

1. Paul Tillich, *Dynamics of Faith.* Harper & Row Publishers New York, 14th Printing, 1965, p. 82.

2. See: Karl Jaspers, *Essais Philosophique. Philosophie et Problèmes de Nôtre Temps*. Paris, Payot, 1970, p. 77.

3. Nicolas Berdyaev, *The Destiny of Man*. New York and Evanston, First Harper Torchbook edition published 1960, pp. 3-5.

4. See: Vladimir Lossky, *Essai sur la Théologie Mystique de l'Église d'Orient.* Aubier, Éditions Montaigne, 1944.

5. William F. Buckley Jr. *The Trojan Horse of American Education, A Baccalaureate Address at St. Joseph Catholic College*, Collegeville, Ind. June 8, 1952, published in his book: *Let Us Talk of Many Things – The Collected Speeches.* Forum, An Imprint of Prima Publishing, Roseville, California, 2000, pp. 12-13.

6. See: Prof. Mitch Pacwa, S.J., *Catholics and the New Age.* Servant Publications, Ann Arbor, Michigan, 1992.

7. See: David K. Clark and Norman L. Geisler, *Apologetics in the New Age. A Christian Critique of Pantheism.* Baker Book House, Grand Rapids, Michigan, Second Printing, 1991.

8. Nicolas Berdyaev, *op. cit.*, Chapter Four: *Concrete Problems of Ethics*, pp. 154-248.

9. *Ibid., op. cit.*, p. 161.

10. *Ibid.*, p. 163.

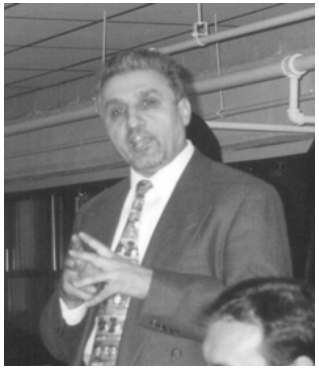
11. *Ibid.*

12. Karl Jaspers, *op. cit.*, p. 75.

13. Nicolas Berdyaev, *op. cit.*, pp. 162-163.

14. See: Anthony Standen, *The Limitations of Science.*, an essay reprinted by Joseph Satin in his book: *Ideas in Context*, The Riverside Press, Cambridge, Massachusetts, 1958, p. 258.

Daniela Anghel (left), Claudia Damian, and Ruxandra Alexe

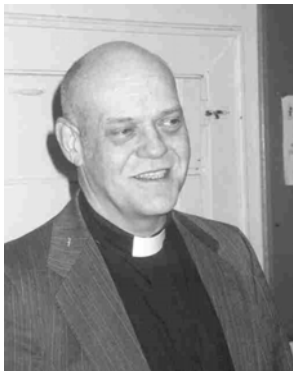


Paul Murariu

Fr. Ioan Cassian Tunaru (front)

Dr. Alexandru Marandici

Rev. Dr. Pavel Niculescu



BERT BREINER, PH.D.

Consciousness, God, and the New Physics

In classroom discussions (and in discussions here at the symposium), I have occasionally alluded to the role consciousness plays in the currently fruitful dialogue between physics and theology. In the manner of a caricature, I would speak of a science which exams the universe with intentional consciousness and suddenly realizes that what is missing from its equations is precisely any recognition of intentional consciousness. Like most caricatures, that is a lopsided presentation of an element of the truth. And yet, it does reflect an element of the rich encounter between contemporary physics and Christian theology.

For some writers, like Paul Davies in his book *God and the New Physics* [1983] and even more so in his later book *The Cosmic Blueprint* [1988], the universe coming to self-conscious is indeed the central focus of meaningful talk about God within the context of contemporary physics. Of course, that is not the only approach made by physicists to the question of God. What is remarkable is the extent to which contemporary physics has generated such a discussion. In some cases, most notably perhaps in the work of writers like the Anglican physicist-priest John Polkinghorn or the Episcopal physicist-priest William Pollard, one may discern elements of a contemporary apologetics for Christian faith, and a fairly traditional and orthodox (with a small 'o') version of the faith at that. In others, like Paul Davies, however, it is clear that this is not the case. In fact, Paul Davies says that he believes that “science offers a surer path to God than religion” (1984 [1983], ix). Here, there is not a hint of an apologist for Christian (or indeed any other type of religious) faith. And yet, the God-question arises for a growing number of physicists.

Part of the reason for this, I believe, lies in the fact that contemporary physics has discovered a world which is no longer fully compatible with the traditional understanding of the mechanics of the world and of the universe. Werner Heisenberg, the founder of the Heisenberg Uncertainty Principle in modern physics, describes what happened to him in the wake of the early discoveries leading to what is now known as quantum physics.

During the months following these discussions an intensive study of all questions concerning the interpretation of quantum theory in Copenhagen finally led to a complete and, as many physicists believe, satisfactory clarification of the situation. But it was not a solution which one could easily accept. I remember discussions with Bohr which went through many hours till very late at night and ended almost in despair; and when at the end of the discussion I went alone for a walk in the neighboring park I repeated to myself again and again the question: Can nature possibly be as absurd as it seemed to us in these atomic experiments? (1962 [1958] p.42)

That question which Heisenberg pondered walking in the park is, of course, a deeply philosophical question. It raises direct and immediate questions about ontology and epistemology. Heisenberg himself was clearly aware of this and addresses it directly in his book *Physics and Philosophy* (1962 [1958]). In his discussion of 'Quantum theory and the roots of atomic science,' he goes back to the pre-Socratics of classical Greece and is able to say that

> We may remark at this point that modern physics is in some way extremely near to the doctrines of Heraclitus. If we replace the word 'fire' by the word 'energy' we can almost repeat his statements word for word from our modern point of view. Energy is in fact the substance from which all elementary particles, all atoms and therefore all things are made, and energy is that which moves. Energy is substance, since its total amount does not change, and the elementary particles can actually be made from this substance as is seen in many

> experiments on the creation elementary particles. Energy can be changed into motion, into heat, into light and into tension. Energy may be called the fundamental cause for all change in the world. (ibid. p. 63)

In a later chapter he addresses some of the epistemological concerns in a discussion of Descartes and Kant. Of Kant, for example, he says

> If one reinterprets the Kantian 'a priori' in this way [as 'practical' rather than 'metaphysical'], there is no reason to consider the perceptions rather than the things as given. Just as in classical physics, we can speak about those events that are not observed in the same manner as about those that are observed. Therefore, practical realism is a natural part of the reinterpretation. Considering the Kantian 'thing-in-itself' Kant had pointed that we cannot conclude anything from the perception about the 'thing-in-itself.' This statement has, a Weizsäcker has noticed, its formal analogy in the fact that in spite of the use of classical concepts in all the experiments a non-classical behavior of the atomic objects is possible. The 'thing-in-itself' is for the atomic physicist, if he uses this concept at all, finally a mathematical structure; but this structure is – contrary to Kant – indirectly deduced from experience. (ibid. p. 91)

The point Heisenberg is making here is fundamental to much of the comtemporary discussion of science and religion. Heisenberg, Davies and Polkinghorne all view the epistemological viewpoint expressed here as essential to the scientific worldview. Heisenberg and Davies call this particular epistemology 'practical realism' and Polkinghorne calls it 'critical realism.' All are agreed, however, that what we derive from scientific inquiry is real knowledge about the way the universe actually is. Of course, all of them accept that this knowledge may (indeed almost certainly

will) need to be revised. This is due in part to the fact that our knowledge is based on observation, on our experience of the universe. Over time, we collect more and more data and also improve our powers of observation with better and more sophisticated tools of observation and measurement. This willingness to accept our scientific knowledge of the world as subject to revision is what the authors in question mean by calling the epistemology of contemporary science "practical" or "critical" realism.

The point is that most contemporary physicists do not believe that quarks or gluons, for example, exist only as mental constructs which allow us to impose a reasonable and workable comprehensibility on the world of our experience. Rather, our authors believe that such concepts enable us both to understand and manipulate our world precisely because they reveal to us something about the ontological reality of the world they describe. Clearly, contemporary physicists are engaged in exploring epistemological and metaphysical questions which contemporary philosophy (and even some contemporary theology) has mostly abandoned.

F. C. Northrop, then the Sterling Professor of Philosophy and Law at Yale University, wrote in his introduction to Heisenberg's book:

> Quantum mechanics, especially in its Heisenberg principle of indeterminacy, has been notable for the change it has brought in the physicist's epistemological theory of the relation of the experimenter to the object of his scientific knowledge. Perhaps the most novel and important thesis of this book is its author's contention that quantum mechanics has brought the concept of potentiality back into physical science. This makes quantum theory as important for ontology as for epistemology. (1962 [1958] p. 4)

Heisenberg himself is even more explicit and states that his uncertainty principle has returned to contemporary physics the

Aristotelian concept of 'potentiality.' We can recall the quote from Heisenberg where he discusses the philosophy of Heraclitus and notice how impressed he clearly is to find contemporary physics echo so many of the concepts of the earliest philosophical thinkers of our tradition.

I have quoted extensively from Heisenberg to show how one of the founders of modern physics was drawn into the realm of metaphysics. Heisenberg notes that this is not true only of himself. He discusses, for example, the metaphysics which Bohm derived from his particular understanding of quantum mechanics. On the other hand, there are thinkers who speak more directly to the concerns of a Symposium held under the auspices of the Romanian Institute of Orthodox Theology and Spirituality. Principal among them is perhaps John Polkinghorne. Polkinghorne is an Anglican priest and a nuclear physicist who was actively involved in the experiments leading to the discovery of quarks and gluons. In one sense, he can be seen as a Christian apologist in the world of modern science. There are, of course, others and Polkinghorne himself makes frequent reference to the thought of Barbour and Peacocke in particular. What sets him apart, however, is his concern with the traditional orthodoxy of the Christian faith. The Christian orthodoxy which most fully informs his thought is, not surprisingly, that of the Western Church, but there are intimations of Eastern thought which develop in part through his dialogue with modern science.

Although there certainly is this dimension to Polkinghorne's thought, there is I believe a deeper level to what he is attempting. He himself is much taken with the analogy between the scientific method and the theological method. In fact, the focus of one his chapters in *Belief in God in an Age of Science* is a parallel exploration of the development of quantum theory in contemporary physics and the development of the Church's christological doctrine as finally formulated at the Council of Chalcedon. However, he seems to be struggling to go beyond the analogy which he himself presents. He presents it as a paradigm of the 'unity of knowledge' and that both science and religion

share a common method of rational human inquiry into their respective subject matters.

Much of what he does, however, seems to be an attempt to do once again what Chalcedon did. At Chalcedon the Church both used the resources of Greek philosophy to make its faith intelligible and also explored the questions raised for its faith by the categories of Greek philosophy. Both of these uses of Greek philosophy are clear in the writings of the Fathers. They are not doing 'philosophy,' they are doing 'theology.' And the vocabulary and categories of their discourse are formed from a constant dialogue with the particular insights and challenges of the best thought of their age. Polkinghorne is definitely doing 'theology.' He is doing it, however, in dialogue with the particular insights and challenges of the best thought of his age. As a priest and physicist, he is particularly well placed to do so.

First, Polkinghorne, like Davies, is very taken with the importance of consciousness. He eschews the process theology of a thinker like Davies (at least in his earlier work) or even the process theology of some Christian thinkers who have explored the relation between science and physics. Consciousness, however, is for Polkinghorne a remarkable fact of the universe. He is impressed by the fact that it seems impossible to view human consciousness as the result of Darwinian natural selection.

> Yet our surplus intellectual capacity, enabling us to comprehend the microworld of quarks and gluons and the macroworld of big bang cosmology, is on such a scale that it beggars belief that this is simply a fortunate by-product of the struggle for life. Remember that Sherlock told a shocked Dr. Watson that he didn't care whether the Earth went around the Sun or vice versa, for it had no relevance to the pursuits of his daily life. (2003 [1998] pp. 2-3)

In other words, our conscious minds and their abilities, seen in the context of Darwinian concepts of natural selection, are over-kill of such extreme proportions that it is difficult to believe that they

were the product of such a process as science has come to understand it. He quotes another eminent physicist, Erwin Schrödinger, as saying 'Although life may be the result of an accident, I do not think that of consciousness. Consciousness cannot be accounted for in physical terms. For consciousness is absolutely fundamental. It cannot be accounted for in terms of anything else' (1996 [1994] p. 12).

Paul Davies provides an even more sweeping critique of the neo-Darwinian theory of evolution. He notes that simple life forms (bacteria and viruses, for example) remain to this day incredibly successful. In fact, as many doctors can attest, they are more successful than more complex organisms. How, then, Davies wonders, can neo-Darwinism account for the increasing complexity shown in the pattern of biological evolution on earth? He presents this argument perhaps most forcefully in a chapter entitled 'Life: its Origin and Evolution' (1988).

Both Davies and Polkinghorne are very much aware of the similarities between many of their arguments and those of classical, particularly medieval, theology. Polkinghorne writes:

> Once again the theistic conclusion is not logically coercive, but it can claim serious consideration as an intellectually satisfying understanding of what would otherwise be unintelligible good fortune. It has certainly struck a number of authors in this way, including some who are innocent of any influence from a conventional religious agenda [a footnote here includes reference to Davies books *God and the New Physics* and *The Mind of God*]. Such a reading of the physical world as containing rumour of divine purpose, constitutes a new form of natural theology . . . . (2003 [1998], 10)

Polkinghorne seeks, however, to distance himself from the charge of resurrecting the classical 'proof' from design. He understands the classical proofs, correctly I believe, as functioning within the realm of logic, whereas the natural theology he is proposing is

based squarely on the scientific method. He offers God not as necessarily derivable from our scientific understanding of the world, but as the best hypothesis to explain what we have, in fact, observed to be the case (ibid.).

Paul Davies also constructs a natural theology based on the argument from design. He believes that "science is in principle able to explain the existence of complexity and organization at all levels, including human consciousness, though only by embracing the 'higher-level' laws" (1988, 203). He realizes that such a belief might seem to imply a denial of God's existence. He concludes, however:

> I do not see it that way. The very fact that the universe *is* creative, and that the laws have permitted complex structures to emerge and develop to the point of consciousness – in other words, that the universe has organized its own self-awareness – is for me powerful evidence that there is 'something going on' behind it all. The impression of design is overwhelming. Science may explain all the processes whereby the universe evolves its own destiny, but that still leaves room for there to be meaning behind existence. (ibid.)

It is both interesting and suggestive that the argument from design should reemerge today, not primarily in the work of contemporary theologians, but of contemporary scientists.

We have already mentioned Polkinghorne's understanding of 'critical realism' (or the 'practical realism' of Heisenberg and Davies). By 'critical realism' he means the belief of most scientists that 'what is going in this process [of scientific investigation] is not merely the extension of a scientific manner of speaking in order to achieve a more empirically adequate account embracing the new phenomena that have been discovered, but the actual uncovering of a more accurate (versimilitudinous) account of the nature of the physical world. It is the desire for ontological knowledge, and not for mere functional success, which motivates the labour of scientists' (2003, [1998] p. 30). It is 'critical' because

it accepts the need for constant revision and realizes that its insights may well need correction in the light of further discoveries. He believes that theology is also a 'critically realistic' endeavor. Earlier, we spoke of Polkinghorne's use of the Council of Chalcedon and used it as a model of what he himself is doing. On the other hand, that was not Polkinghorne's reason for devoting most of the second chapter of *Belief in God in an Age of Science* to that particular church council. He there compares it to the various stages in the development of quantum physics in the 20th century. In the process, he develops a paradigm of the scientific method which applies both to scientific (in the modern sense) and theological inquiry. Both of them involve the use of 'critical realism.' Both of them need to believe that our knowledge reveals something of the ontology of that which is known. Both science and religion also need to be critical of their own realism, because neither of them can safely assume that our current understanding is based on a full and complete understanding of that which it seeks to know and understand.

While this is an important epistemological question, it is interesting how another aspect of epistemology comes up both in the work of Davies and Polkinghorne. Both of them are at pains to explain how scientific progress often relies on insight and on non-empirical considerations. Both of them refer to the esthetic component of scientific theories and to the preference of scientists for elegant mathematical solutions. Indeed, this has often led to the adoption of one theory over another by a majority of scientists when there has been no other way to judge between the competing claims of two rival theories. Even more than Polkinghorne, however, Paul Davies explores the mystical dimension of knowledge. In *The Mind of God* he devotes parts of several chapters to discussing this more intuitive form of knowing. He mentions, for example, that both Kurt Gödel and Roger Penrose (prominent mathematicians) were admitted Platonists. He sites several examples of 'mathematical inspiration' that those who report them believe to be sudden and seemingly unrelated to all the previous work they had done on whatever particular problem

the insight suddenly clarified. He reserves for the final chapter, however, the example of Fred Hoyle who, in the 1960's, was working with some colleagues on a cosmological theory of electromagnetism that involved some particularly difficult mathematics. Davies quotes Hoyle's description of his sudden inspiration:

> But somewhere on Bowes Moor my awareness of the mathematics clarified, not a little, not even a lot, but as if a huge brilliant light had suddenly been switched on. How long did it take to become totally convinced that the problem was solved? Less than five seconds. It only remained to make sure that before the clarity faded I had enough of the essential steps stored safely in my recallable memory. It is indicative of the measure of certainty I felt that in the ensuing days I didn't trouble to commit anything to paper. When ten days or so later I returned to Cambridge I found it possible to write out the thing without difficulty. (quoted in Davies, 1992, 229)

Hoyle himself compared this experience to Paul's experience on the road to Damascus. This is important for Davies who considers the limitations of rational inquiry into the nature of the universe. In 1931, Kurt Gödel, a Princeton mathematician and logician, proved a theorem which meant that no mathematical system could be entirely self-contained. For such system, there would always remain true mathematical statements that could not be proved in terms of the axioms and definitions of a given system. Since mathematics is the language of physics, this theorem has profound implications for science's ability to understand and explain the universe. I mention this here because it provides the backdrop for Davies hesitating appreciation of mystical knowledge.

> We are barred from ultimate knowledge, from ultimate explanation, by the very rules of reasoning that prompt us to seek such an explanation in the first place. If we wish to progress beyond, we have to embrace a

> different concept of "understanding" from that of rational explanation. Possibly the mystical path is a way to such an understanding. (1992, 232)

This is remarkable because Davies immediately admits that he has never had a mystical experience and also because, he is at great pains to demonstrate that both the theistic and the atheistic understanding of the universe present similar problems and are both equally defensible in terms of 'logical' or 'scientific' proof.

This article has merely presented some of the exciting areas in which a fruitful dialogue between science, especially contemporary physics, and theology are engaging each other. Let me end with another quote from Paul Davies' *The Mind of God.* It is the quote with which he ends the book. He speaks of the mystery which links us to the universe, our consciousness, our ability to question the meaning and working of the universe of which we are apart. He ponders the mystery that we can even glimpse the rules by which the universe is governed. He then concludes:

> What does it mean? What is Man that we might be party to such privilege? I cannot believe that our existence in this universe is a mere quirk of fate, an accident of history, an incidental blip in the great cosmic drama. Our involvement is too intimate. The physical species *Homo* may count for nothing, but the existence of mind in some organism on some planet in the universe is surely a fact of fundamental significance. Through conscious beings the universe has generated self-awareness. This can be no trivial detail, no minor byproduct of mindless, purposeless forces. We are truly meant to be here. (1192, 232)

Davies is, quite consciously I believe, echoing the eighth psalm: “what is man that thou art mindful of him, and the son of man that thou dost care for him? Yet thou hast made him little less than God, and dost crown him with glory and honor.” (Revised

Standard Version) His conclusion that the mystery of human consciousness is, in fact, a mystery of the cosmos; that it is, in some sense, *the* cosmological mystery, would certainly not surprise a Christian thinker like St. Augustine. In his *De Trinitate*, he says to us mere mortals that if we would grasp something of the mystery of the Trinity, we must look to own consciousness, for we are made in the image of the triune God. Perhaps the direction of modern physics is to find in the mystery of consciousness a hint of the mind of God.

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RICHARD GRALLO, PHD

Contemporary Empirical Science as Quest

Introduction

What kinds of activities and goals are involved in contemporary empirical science? To what extent do these activities and goals inform a general scientific quest? What are scientists doing when they are engaged in this activity? What basic attitudes increase the probability of their success? What are the implications of these goals and attitudes for other forms of consciousness such as common sense or religion? How do the goals of science differ from that of common sense or religion?

The general purpose of this paper is to suggest how *contemporary empirical science* is involved in a quest that is, at least potentially, complementary to the goals of *common sense* or *religion*. The notion of *quest* itself requires some clarification. In general a quest will involve at least three elements: (1) a long, protracted and frequently inconvenient search for something of great value, (2) the presence of *questions* and the *cognitive process of questioning,* (3) approaching a *known unknown,* or what some would regard as a *mystery*.

Specifically, the aims of this paper will be to (1) offer an example of a quest in contemporary empirical science, and to extract from this example general *aims of science* and required *attitudes of critical thinking*, (2) distinguish contemporary empirical science from *ancient science*, from *common sense* and from *religion*, and (3) offer some recommendations for the future.

An example from medicine

Recent research into HIV disease in the United States provides a useful, time limited example of various goals in contemporary empirical science. In the late 1970's in the United States a few remarkable cases of death began appearing in the medical literature. It appeared that some patients had died from very unusual opportunistic infections, for example pneumonia strains usually found in animals or very rare forms of cancer. As more cases of persons with opportunistic infections began appearing in hospitals and as the condition was related to other cases identified in Europe and Africa, the U.S. Centers for Disease Control (CDC) became increasingly involved and referred to the condition, which always seemed to result in death, as "acquired immune deficiency syndrome" or "AIDS". As a *syndrome* the CDC was acknowledging a loose collection or cluster of symptoms, but it was also indicating that the *cause or causes* of the condition were unknown.

Increasing research activity took on the nature of a *quest* to understand, treat, control and ultimately cure this growing health menace. As quest, there would be a long, protracted search to reach these goals. In addition, *questions* and the process of *asking further relevant questions* would play a driving and defining role in this search. Finally, in dealing with disease, researchers were confronted with a *known unknown*: a situation characterized by the presence of important unanswered questions. (Bromberger, 1993)

Early research on AIDS focused on *describing* symptoms as well as the course of the disease. As the disease began to spread, health care practitioners became increasingly concerned with what they could reasonably expect: their concern here was with accurate *predictions* to assist in improving health care practice. They were also concerned, of course, with identifying the *causes* of the disease as well as viable *interventions*. In the mid 1980's, CDC researchers and others had tentatively identified a *cause* for the opportunistic infections: a retro virus referred to as

the *HIV virus,* or "human immuno-deficiency virus". Usually, when evidence accumulates for a *cause* for a *syndrome*, the syndrome is redefined as a *disease*. At about this time, the CDC coined the term "HIV disease" to indicate this shift in thinking.

Also, since the mid 1980's, increased research attention has focused on *interventions.* Some interventions, like the early drug AZT, worked by killing HIV infected cells. There were problems with this approach which became clearer over the years: while the infected cells were killed, the patients themselves often became weaker and suffered other serious side effects. (For purposes of this paper, we will refer to the related aim of science as a *control intervention.*) Another approach involved the use of the activity of the virus to defeat itself. This approach had been tried with widespread general success in the development of the polio vaccine. (For purposes of this paper, we will refer to the related aim of science a *synergistic intervention.*)

Aims of Science

Based on this example we can extract five *aims of science* that serve as goals in a great deal of contemporary scientific research: (1) description, (2) prediction, (3) explanation, (4) control and (5) synergy. This list represents an expansion of other lists (e.g. Myers, 2002).

Description refers to any attempt to answer questions such as: What is happening? or, What was happening? In the AIDS example, this search referred to attempts to indicate observable symptoms as well as demographic factors associated with the patients. Such accounts would allow for comparisons with other known situations, and might prove useful in *generating hypotheses* and *theories.* However, as useful as these efforts may be, they do not address the future.

Prediction refers to any attempt to answer future oriented questions such as: What will happen? In the AIDS example, health care practitioners wanted to know what they could expect

next with patients who exhibited these symptoms. They wanted to have a knowledge of the course of the disease. Epidemiologists wanted to know where and how fast the disease was spreading. As useful as these efforts might be, they do not address the *cause(s)* of the disease.

Explanation refers to any attempt to answer questions such as: Why is this happening? As such, it is an attempt to isolate and identify the cause or causes of the disease. In the AIDS example, a number of possibilities were suggested, but the weight of scientific opinion seems to have settled on a retro-virus, named the HIV virus. As important as this progress is, however, knowing the cause of a disease does not guarantee successful treatment.

Both *control* and *synergy* are aims of science that have to do with treatment or intervention. *Control* is an attempt to answer the question: How can we change what is happening? *Synergy* is more refined and is an attempt to answer the question: How can we change what is happening, using naturally existing forces? The difference between the two has to do with "side effects" and subtlety of approach. For example, it is well known in medicine that some medications, for some people, can have serious "side effects". Sometimes these effects are lethal. The phrase "side effect" suggests "unimportance", but perhaps they are better named "undesired effects". In the AIDS example, one promising early drug was AZT. AZT worked by killing the HIV virus *as well as* the cells it had infected, resulting in the undesired effect that many patients were made even weaker by the treatment. A *synergistic* treatment would work by *using the activity of the virus to kill itself,* leaving in tact the remainder of the body. While research is currently moving in this direction, as of 2004 no successful synergistic treatment has been found.

The *aims of science* are not limited to medicine, but can be applied to greater or lesser extent in all the physical and human sciences. Obviously, in astronomy, we can reasonably expect to pursue description, prediction and explanation. Perhaps we can pursue only very limited interventions there. In psychology, all five aims can be pursued, although sometimes different aims are

pursued by different researchers. In education also, all five aims can be pursued. Take, as an example from education, a 7th grade math classroom**.** A teacher could begin by collecting data on how students actually attempt to solve math problems. Such data would answer the *descriptive* question: What are these students doing when they attempt to solve math problems? With enough of this data, the teacher could begin to make hypothetical *predictions*: If student A continues to address this kind of problem in this way, then _____. A careful review of the data and the tested predictions may lead to tentative *explanations* as to why some students are not successful. Those explanations may suggest any of a number of interventions. *Control* type interventions would tend to be more teacher centered, and may have undesired effects such as students becoming more anxious or uninterested in math. *Synergistic* interventions would tend to be more student centered, and attempt to build a bridge from the students' already existing interests to the subject matter of math (Grallo, 1988).

The *aims of science* can also be used to ground a distinction between *basic* and *applied research.* Basic research is scientific research that is primarily involved in the aims of description, prediction and explanation only. Applied research is more oriented towards interventions.

Contemporary Science and Attitudes of Critical Thinking

To be successful in the scientific quest, the scientist must approach this task with four basic *attitudes of critical thinking*, the violation of which jeopardize the entire enterprise. In addition these attitudes have opposites, which can be major factors in distorted thinking. These latter we can name *attitudes of distorted thinking.*

1) *Open-mindedness* refers to a willingness to consider alternative possibilities, whether those alternatives be descriptions, hypotheses, explanations, theories, strategies or whatever. The

opposite attitude may be referred to as *closed-mindedness* – an unwillingness to consider alternatives, often involving the ruling out of relevant information. Lonergan (1958) has described *bias* as being an unwillingness to consider further relevant questions or ideas. This type of bias is a basic *process*, (different from the product bias described by Kahneman and Tversky (1984) and Tversky and Kahneman (1974)). The unwillingness to consider further relevant questions and ideas has pervasive limiting consequences for the development of knowledge. In our medical example, early investigations into AIDS focused on multiple possible explanations, and now after the turn of the century the focus is on multiple possible treatments. Premature exclusion of these possibilities would adversely affect our ability to achieve the best understanding of the disease and a variety of useful treatments.

2) *Objectivity* refers to an attitude wherein the *desire to know* is dominant. Its opposite may be referred to as a *rule of other passions.* Objectivity in the sense described here is a detached and somewhat playful attitude of seeing where things lead. Distraction by other desires and emotions usually wrecks this playfulness, and starts carrying the search in directions other than "where things lead". The rule of other desires can needlessly slow progress. In high strakes research such as the search for an AIDS vaccine, it is always possible that other desires can co-opt the search for a cure, for example the desire to win the Nobel prize or the desire to be famous. To the extent that such desires control scientific activity, the desire to know becomes a secondary influence.

3) *Moderate scepticism* can be defined as a reluctance to make a judgement in the absence of sufficient evidence. This is an attitude of restraint and basic caution, and its opposite is *prejudice* – a rushing forward to make judgements without sufficient evidence. The scepticism described here has nothing at all to do with a nihilistic, universal scepticism that asserts that knowledge is not possible (Meynell, 1999). In AIDS research, if an attitude of universal scepticism had prevailed no attempts at

understanding or curing the disease would have been made. In contrast, a more moderate scepticism has been the prevailing attitude and this kind of scepticism often appears in the form of debates. To the credit of science, most scientific debates revolve around evidence. (To be sure, some concern assumptions, definitions or methodology.) In the AIDS example, the majority of researchers will probably wish to see all cases, both usual and anomalous, explained under a single unified theory. To the extent that this is not done, the debate about evidence (and theory) will continue.

4) *Proportionality in judgement* refers to circumstances in which a person's judgement matches the evidence available. It is quite different from its opposites of *over-generalization* and *timidity in judgement.* Here also scientific debates play a very important role, particularly in clipping the wings of theories that fly too far beyond the supporting evidence.

Some authors argue that there is a special scientific method. Physicist Polkinghorne (1998) disagrees, arguing that the scientific method is really just an example of critical thinking. That latter idea is extended here to include the four basic attitudes of critical thinking.

What Contemporary Science is Not

The contemporary empirical science that has been described here is basically a quest: a search for answers (Bromberger, 1993), a search leading to knowledge, opinion and belief regarding *things in relation to one another* (Grallo & Breiner, 2001). As such, science understood in this way is not to be confused with the ancient science of the Greeks, with common sense or with religion.

It is not *ancient science* (à la Aristotle of the Posterior Analytics). As specified there, Aristotle envisioned a science that contained propositions that were *true, certain, universal* and *necessary*. By the Enlightenment it was becoming increasingly

clear that this account of science could not be supported by the facts. What was certainly true gave way to what was probably true, what was universal gave way to what is general, and what is necessary gave way to what is generally contingent. By the postmodern era, further shifts occurred. What was probably true has given way to what is more likely than not, what was general has given way to local condition seeking, and what is was generally contingent has given way to what is ecologically contingent.

It is not *common sense*. Drawing on the work of Lonergan (1958), c*ommon sense* can be defined as knowledge, opinion and belief regarding *things in relation to us* for practical purposes of daily living. In contrast, c*ontemporary empirical science* can be defined as knowledge, opinion and belief regarding *things in relation to one another*, as determined by the methods of data collection, measurement (where possible), hypothesis generating and hypothesis testing (Grallo & Breiner, 2001). Science understood in this contemporary way is a form of consciousness oriented to finding out how things work in nature. Common sense is a complementary form of consciousness concerned with the practical activities of daily living.

It is not *religion.* Breiner (2000) defines *religion* as "a world view which holds that the universe in its entirety and humanity's place within it can only be truly understood in relation to a reality which is transcendent to both." Lonergan (1972) refers to what Friedrich Heiler calls the main characteristics of *religion:* (1) There is a *transcendent reality*. (2) That such a reality is *immanent* in humans. (3) That such a reality is supreme *beauty*, *truth*, *righteousness* and *goodness.* (4) That this reality is *love*, *mercy*, *compassion.* (5) That the way to this reality is through repentance, self-denial, prayer, *love* of one's neighbor, even one's enemies. (6) The way is *love* of this reality, and *bliss* is conceived as knowledge of it, union with it or dissolution into it. These basic characteristics of religion can also be appreciated from a psychological point of view (Grallo, 2002). Understood in these ways, there is no inherent contradiction between contemporary

empirical science and religion. Each has its own sphere of influence and its own methods, designed to address different sets of questions.

How are the quests of contemporary empirical science and religion related? The religious quest *sublates* the quest of contemporary empirical science. What does this mean? It means that the religious quest respects and incorporates the quest of contemporary empirical science in so far as it goes, and that it takes up that quest and places it in a larger context, for example the context of *goodness* (ethics) and the context of *love* (willing the good of persons).

A Few Recommendations

If contemporary empirical scientists are indeed engaged in pursuit of the goals outlined here, in accord with the attitudes of critical thinking cited above, then the resulting science is not fundamentally incompatible with other human pursuits such as those found in religion or the common sense applications of every day life. To highlight and to spread the general knowledge of these compatibilities more in the way of serious dialogue needs to occur.

Let there be more informed dialogue between philosophers, theologians, public policy makers and scientists. (Two possible venues: Romanian Institute Ecumenical Symposia and the Lonergan Workshops.) To insure the likelihood of these conversations philosophers, theologians and public policy makers must be more informed about scientific matters and willing to engage scientists in dialogue. Scientists and those who support them, for their part must be prepared to expand their horizons: particularly into *ethics* if they are engaged in *applied science,* since applied science requires *decision making.* They should be willing to engage in ongoing dialogue with philosophers, theologians and public policy makers. What we need to avoid altogether are expressions of differences between the

scientific form of consciousness and other forms of consciousness, such that mutual understanding and appreciation is not promoted.

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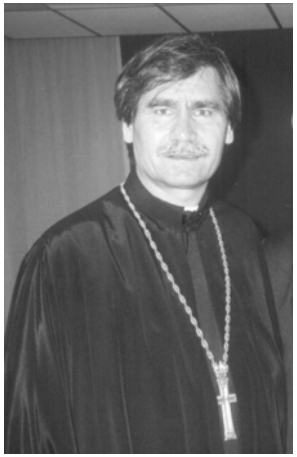
REV. FR. THEODOR DAMIAN, PH.D.



Science and Religion: The Transcendent Ground of Order

L. Wittgenstein was clear in his message about world and life: everything is mystery. “The entire modern conception about the world is based on the illusion that the so-called laws of nature represent the explanation of the natural phenomena” [...] “It seems to us that when all possible scientific questions were answered, the problem of life remains completely untouched.”

According to Wittgenstein, it is not the mode of existence of things that is mystical, it is the fact that they do exist (see “Philosophy in an Old Key” by Edward T. Oakes, in *First Things*, Nr. 108, Dec. 2000, p. 29).

It seems to me that Metaphysics enters the scene of the 21st century in wedding clothes.

If everything is a mystery, then where do we start? Or, maybe even better, do we need to start at all? What happens if we don’t start? Of course, if man has an inquisitive mind, that does imply that it is normal for us to start, to think, to ask questions. After all, both, Meister Eckhart and Nietzsche taught us to have a”why” for everything.

We are bound to the mystery the way we are bound to life. That is why the metaphysical quest is not only the most normal way of self-conscientization, it is the most imperative and essential.

In its long history man has a very long tradition of acknowledging the mystery and attempting to deal with it. It was that tradition that placed man in the dignity he or she claims to have and it is the break from it that came in our time, from

Enlightenment especially, that produced the fall from the common sense.

In his book *Return to Reason,* Steven Toulmin explains in detail how Enlightenment is responsible for the loss of balance by human reason and how Enlightenment threw reason in the darkness. In other words Enlightenment produced the divorce between science and religion, the break away from Tradition. And as Jean Bethke Elshtain put it, if we lose Tradition, what we are left with is the abyss ("Beyond Traditionalism and Progressivism, or Against Hardening of the Categories" in *Theology Today,* April 2001, p. 4).

Paul Florenski, analyzing this entire phenomenon concluded in a more drastic tone: The only choice we will be left with will be the Holy Trinity or madness!

In his article "Returning to Reason Reasonably" Peter Berkowitz notices that today the tendency to believe in reason is in decline and that professors of the academic community are pioneers of this tendency *(First Things,* Nr. 125, Aug. - Sept. 2002, p. 61).

Now, if we are returning to metaphysics, we can think things again. In this context one of the most fundamental things that powerfully challenges our mind is the phenomenon of order through which everything is kept into being.

Indeed order is a phenomenon, something that appears; just like a phenomenon which implies that something appears out there but it does not explicitly tell you why, where it is coming from, and how much of it did not appear and consequently is beyond appearance, so is order: it is out there and we do not know much about it.

According to a common dictionary definition, order has to do with a logical arrangement of separate elements in order for them to be able to appear or to function. In other words, what makes something appear or a phenomenon is order. We see what appears to be or to our senses but we do not see what makes it appear.

Order then is concept that we don't understand. We are using it, taking advantage of it, of course, it is out there. We try to decipher it by means of our reason and that brings us to the classical dilemma implied in the question: is reason a product of order or order a product of reason? Or, are order and reason equivalent? If order is a product of reason, of a supreme reason that Sir John Templeton calls "infinite intellect" *(Possibilities of Over One Hundredfold More Spiritual Information: the Humble Approach in Theology and Science,* Templeton Foundation Press, Philadelphia and London, 2000, p. 148) then it is understood why order implies rationality, and that what creates remains in what is created.

St. Maximus the Confessor was then right to speak of the λογοι, traces, reflections of the Divine Reason, of God's Logos in every thing, thus validating St. John the Theologian's profoundly philosophical and theological claim that at the beginning there was the Logos and that everything that was created came into being through it and everything reflects it.

It is because of the mystery of order that Voltaire said his famous reflection that the universe is puzzling him and that he cannot think how a clock can exist and function without its maker who has to wind it up.

Everything is order because everything is a system. But also everything is a system and part of a system at the same time because of the order in it.

A system is an orderly combination of several elements into a whole according to a rational principle. The change and status quo aspects of the system and their fundamental relation remain a mystery to us and that is applicable to everything in creation from macrocosmic realities to the microscopic ones, from the universe in the large sense to the universe of the atomic or sub-atomic particles. Even the little entity that produced the big bang which according to particle physicist Stephen M. Barr who works at the Bartol Research Institute at the University of Delaware is only a hypothesis (see his book *Modern Physics and Ancient Faith,* reviewed by Robin Colins in *First Things,* Nr. 137, Nov.

2003, pp. 54-57) is supposed to be characterized by order, otherwise it would not exist itself at all. And yet, here is the paradox: where it is coming from, science does not know. But what it does, science thinks it knows. It explodes. However, how can a big thing be contained in a small one? Or how can there be order in an explosion? Science does not respond and when it attempts to respond it is not convincing. This is what even scientists say.

When we ask the question what is the cause of the original particle - which brings to mind some atheists' question what is the cause of God - there is no response or the response is that it existed forever and is there by itself, just as theology responds to the question of God. However an atheist would dismiss such a response when it comes to God as being causa causarum, the unmoved mover, but will sustain a similar one when it comes to the original particle.

Or if the particle came out of nothing, and that would be acceptable for an atheist, why wouldn't the belief in the World's creation out of nothing be acceptable?

Indeed, order, that keeps things into being originates from beyond them, and we have to accept our ignorance just like H. Bondi put it so clearly: How can we know something if we don't know everything? Or just like when we think of the famous classical question: why is there something rather that nothing?

We have the same dilemma with regard to space, time and norms. On the one hand we need to define them, otherwise, James H. Charlesworth writes, everything makes no sense - and our society, which is barely worthy to be called a culture is the witness of the destruction of the space, time and especially of norms ("The Dead Sea Scrolls; Fifty Years of Discovery and controversy", in *The Princeton Seminary Bulletin*, vol. 19, Nr. 2, 1988, p. 132). On the other hand we cannot define them or understand their cause, as Sir John Templeton again asserts *(ibidem).*

It seems to me that space, time and especially laws are elements of order. How can one develop a valid and objective criterion for their definition? Or, if there are definitions, how can

one know that any certain definition is definitive, total, ultimate? Is there even the possibility of a unified definition of any thing? As Descartes noticed, there cannot be several definitions about one thing and all be true. If one only is, then which one? How do we know that we know? If we are elements of a part within a system we cannot know the system because we only see our own universe which is the part. Yet the system is not the part and cannot be defined through it.

If we are not elements of a part within a system but parts of it, who can demonstrate that the part can have knowledge of the whole? Bondi's question: How can one know something if one does not know everything implies that knowledge is indeed impssible because everything is part of a system and no part can know the whole, and not even itself.

Let us think of the classical γνῶτι σεαυτον, know thyself, and where we are in relation to it.

If knowledge of a system were an easy thing, at least since Socrates' time, in 2500 years of progress and civilization we should have exhausted the field: the self! Obviously, this is not the case.

Syllogistically speaking, if we cannot know the system and since what keeps the system into being is order, we cannot know it either. And we know the order all the less since it is in the system, but it is something else than the elements of the system, just like Heraclitus spoke about the role fo the Logos in relation to the atoms. Order is like Christ's apostles: they are in the world but not of the world. Like Christ Himself, as well. The same thing can be said about life and organs of body. Life is in the body but is not identical with any part of the body. It only does something to every element.

What is life? What is order? Is life a kind of order? It seems that order is of a higher provenance than the elements of the system, it transcends the system.

Maybe that is why the hinduistic philosophies speak of everything that we see and think we know as being *maya*, illusion, whereas reality resides in what we don't see, which is what keeps

what we see into being, which in our case is the ordering principle.

As S. Ajaya explains, in contrast to the Western way of thinking which is based on fragmentation and promotes it as well, the Hindu way is holistic, and integrative which gives one more and better chances to say something about any thing.

The denial of the beyondness of things, which is usurpation of metaphysics, leads to moral and social degradation, and this applies to our time and society in the understanding of Friithjof Schuon *(The Transfiguration of Man*, see Bruce K. Hanson's review in *AAR - Journal of the American Academy of Religion*, vol. 65, Nr. 4, 197, p. 919).

I think he is right in this assumption and observation. I would only add that this usurpation produces a degradation in our mind, of our way of thinking, as the social and moral aspects of our life are generated by our thinking. If our thoughts are wrong or sinful, that is how our acts are. That is why the Church Fathers were right to define sin as an error of thinking.

The usurpation of metaphysics implies the self sufficiency of the physics, that the system can be without the transcendent order that keeps it into being, that the part can know itself and the system. This self sufficiency equivalent of the autonomy of the individual promoted by Enlightenment has an anticipation in Protagoras' anthropocentric philosophy where man is the measure of all things, thus being the supreme and only authority in everything.

When we think of Protagoras' *panton metron anthopos*, which does imply according to J.B. Elshtain ("Democratic Authority at the End of a century," in *The Hedgehog Review*, vol. 2, Nr. 1, 2003, p. 36), the negation of transcendence as it was seen especially in the twentieth century, a natural question comes to mind: Is man him or herself included in this *panton* all things? Most probably man is not there included and he is not then his or her own measure since man does not know himself. One can question if man knows the other things in order to be able to measure them, and I am talking here about the post-Adamic man,

not about Adam when he gave names to things.

What is the thing that we really and totally and unmistakably and definitively and ultimately and unfailingly know so that we can measure it?

As Milon Opocenski notices ("The Theology between Yesterday and Tomorrow," in *The Princeton Seminary Bulletin*, vol. XXII, Nr. 3, 2001, p. 334) this autonomy mentioned above leads to titanism and ends up in despair, just as Nietzsche and Cioran would also say. It is this situation Opocenski says, taking it from Dostoievski, that made the Western hemisphere of the world a wonderful cemetery.

The remedy to the tragic situation, again according to Dostoievski, is possible only when the world will believe in something that is unconditionally holy.

In other words, the world needs to go back to God, to let God be God as K. Barth advises, or in Paul Ramsey's words, "People must not play God's role before they learned to be human; when they have learned how to be human they will not play God's role any more" (see Ronald Coler-Turner, "Biotechnology: A Pastoral Reflection," in *Theology Today,* April 2002, p. 46).

It is against this type of arrogance and usurpation discussed above that Maximus the Confessor implicitly talks about when he postulates that each thing has its own inner logos or rationality since it originates from God through God's logos. And if this rationality is of divine origin it cannot be known or measured by man. If without it things cannot exist, whether we put it theologically or according to the system's theory, it follows that the rationality of things, their ordering principle and *raison d'etre* while to be found within a system is coming from outside it; it is then only a reflection of an external reality and consequently being transcendent cannot be controlled, known, measured.

As Lothar Schaefer more radically puts it, the transcendent originates the physical world *(In Search of the Divine Reality,* see *Theology Today*, Jan. 1999, p. 597).

Schaefer argues in his book that the quantum mechanics, for instance, among other things, indicates the existence of a transcendental reality, and Steven Davis, on the same topic announces that the time when people used to formulate demonstrations about God's existence has passed *(God, Reason and Theistic Proofs,* see book review by Charles Taliaferro in *Theology Today,* January, 1999, p. 603).

Indeed we assist at the discovery of God through science when science came to realize the mystery the way it never did until now. We live in a time when it is no longer the believer who must defend God against the atheist's argument, but the atheist is the one who needs to argue and defend his position of rejection of God (Patrick Glynn, *God: The Evidence. The Reconciliation of Faith and Reason in a Postsecular World,* see book review by Edward T. Oakes, in *First Things,* Aug.-Sept. 1998, pp. 64-66).

* * *

Science and Religion are good biological sisters who loved each other and worked together until something or somebody separated them making them look like enemies, or at least, making people believe that they are antagonistic to each other.

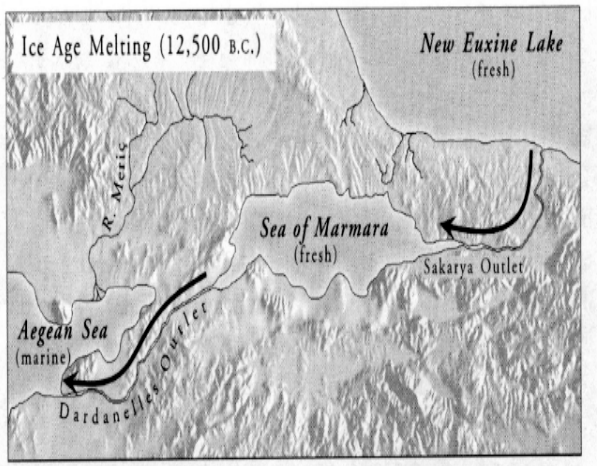
The artificial theory of separation and incompatibility between the two was like a fundamentalistic religion in itself; it spread through indoctrination and used all the tools that any religious fundamentalism uses.

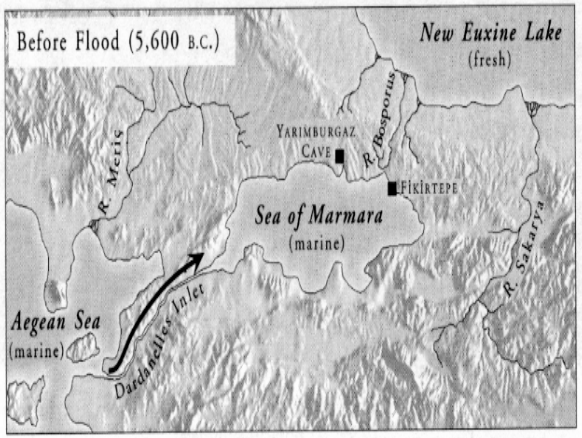
It took about 300 years for the two sisters to begin to realize that they are in fact sisters, to rediscover each other, to understand that they can work together, especially since both have the same purpose which is the ultimate happiness of man, the advance toward the truth; indeed, although each one uses its own means and ways to get there, the quest and the target are the same.

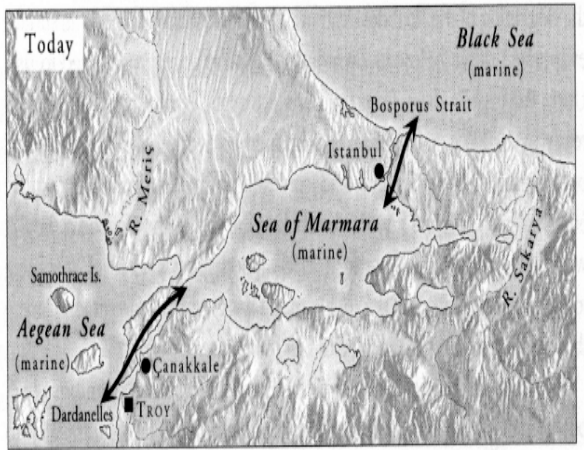
Today is time when the salvation of reason from the darkness of Enlightenment as Steven Toulmin puts it *(Ibidem)* will

be considered like another Great Awakening in our history, equivalent maybe with a new axial period, maybe The Second Axial Period in human civilization according to Ewert H. Cousins's vision ("Greek Metaphysics in Judaism and Christianity, Viewed from a Global Perspective', in *Archivio di Filosofia,* Anno LIII, Nr. 1, 1985, pp. 122-124), because it implies a new transformation of man's consciousness.

If the compatibility between Science and Religion was discovered then there will be dialogue. If there is dialogue, there is hope and this is what our world needs today. To put it in William R. Marty's words (see "Liberalism without Transcendence" in *Journal of Interdisciplinary Studies,* vol IX, Nr. 1-2, 1997) who criticizes the confusing and directionless liberalism of our present day society, in this "shameless world" (the expression belongs to Christopher Lasch) liberalism cannot be instaured unless it becomes dependent on transcendence, namely on the divine principle and the spiritual and moral values deriving from it.







William Ryan and Walter Pitman, *Noah's Flood. The New Scientific Discoveries about the Event that Changed History*, Simon and Schuster, New York, 1999.

NAPOLEON SĂVESCU, M.D.

Religion versus Science *

For thousands of years, the legend of the great flood has endured in the biblical story of Noah and such Middle Eastern myths as the epic of Gilgamesh. Few scientists believed that such a catastrophic deluge had actually occurred. But these Bible "stories" for some scientists appeared to have a real sense. Considering that religion and science have to work together, two distinguished geophysicists have discovered an event that changed history; a sensational flood 7,600 years ago in what is today the Black Sea.

Not only in the Bible do we have references to the flood but also in the ancient clay tablets excavated from the ruins of biblical Nineveh more than a hundred years ago; these tablets revealed a much older version of the same flood legend. Archeologists searched the length and breadth of the Tigris and Euphrates rivers in Mesopotamia for evidence of such a flood, to no avail. Then, as earth scientists made new discoveries about the history of rapid climate change, they learned that the Mediterranean Sea had once been a desert and 5,000,000 years ago, the Atlantic Ocean burst through the Strait of Gibraltar and refilled the Mediterranean basin. William Ryan and Walter Pitman posed the scientific question "Could some more recent, similar catastrophe have been the source of Noah's Flood?"

The end of the Cold War enabled Ryan and Pitman to team up with oceanographers from Bulgaria and Russia, as well as Turkey, to explore the Black Sea. Using sound waves and coring devices to probe the sea floor, they discovered clear evidence that this inland body of water had once been a vast freshwater lake

*Summary of a longer power point presentation.

lying hundreds of feet below the level of the world's rising oceans.

Around 12,500 B.C., earth temperature increased, and the Eurasian ice sheet started to melt. The level of the oceans increased by 110 meters. The peninsula of England became an island. The Atlantic Ocean water burst again through the Strait of Gibraltar and refilled the Mediterranean basin. The increased Mediterranean sea level of 110 m. had a disastrous consequence. Huge pieces of land were flooded, such as the piece of land that connected the Balkan peninsula with Turkey, which disappeared giving birth to a new sea, the Thracian Sea, later known as the Aegean Sea with many new islands. Strange cultures, very advanced civilizations were left in these islands, long time ago on the tip of mountains, proving that this piece of land was an important corridor of civilization that linked Europe and Asia. Suddenly the legend of lost Atlantis started to make more sense.

Sophisticated dating techniques, sometimes using both the carbon 14 and a new method of Thermal Ionization Mass Spectrometry (TIMS), confirmed that 7,600 years ago the mounting seas burst through the narrow Bosporus valley, and the salt water of Mediterranean poured into the lake with unimaginable force, racing over beaches and up rivers, destroying or chasing all life before it. The margins of the lake, which had been a unique oasis, a Garden of Eden for an advanced culture in a vast region of semi-desert, became a sea of death. The people fled, never to return.

Today scientists explore the existing archeological, genetic, and linguistic evidence suggesting that the flood rapidly created a human diaspora that spread as far as Western Europe, Center Asia, China, Egypt, and the Persian Gulf. They have suggested that the Black Sea peoples could well have been the mysterious proto-Sumerians who developed the first great civilization in Mesopotamia. Biblical Noah's Flood is solidly demonstrated by contemporary science. It is an astonishing religious story that sheds new light on our roots and gives fresh meaning to ancient myths.

MIHAI VINEREANU, M.A.

Linguistic Contributions to the Understanding of the Early Christian Lexicon of the Romanian Language

Religion is an important aspect in the continuity of the Romanian people. They have, from the beginning, not only a common language, but also a common religion. Even before Christianity, the Dacian kingdom was formed by a nation having also a common language and religion. In their kingdom, *Decaeneus* was the high priest, second only to the king. He was the king's first counselor and in certain situations, the high priest might become king.

Later on, as Christianity spread throughout the Mediterranean and Lower Danube region, the new religion seemed to find many things in common with the Zamolxian faith. According to some scholars, the assimilation of the new religion by the Dacian people was not so difficult because Christianity shared already some similarities with the religion founded by *Zamolxis* many centuries earlier.

The very idea of certain common traits between the Jewish monastic sect of the *Essenes* and the Dacian priests, called *Ctistai* was mentioned by Josephus in his *Jewish Antiquities:* "They (the Essenes) deserve admiration in contrast with all others who claim their share of virtue because such qualities as theirs were never found before among any Greek or barbarian people". Further, Josephus tells us that they hold their possessions in common, they do not bring wives into the community, nor do they own slaves, slavery being considered unjust and devote themselves to agricultural labor. Finally he says "their manner of life does not differ at all from that of so-called *Ctistai* among Dacians, but is as close to it as could be" (18, 22-23). This observation is extremely

important. Even before Josephus, the *Ctistai* were also mentioned in Strabo (7, 296). Strabo, following what Posedoinus said before him, tells us that "the Mysians (a Dacian tribe south of Danube river) who in accordance with their religion abstain from eating any living thing and therefore from their flock as well, use as food honey and milk and cheese, living a peaceful life, and for this reason are called "god-fearing" and *"capnobatae"* and are some of the Thracians who live apart from woman-kind, these are called *Ctistai* and because of honor in which they are held, have been dedicated to the gods and live with freedom from any fear, accordingly. Homer speaks collectively of all these people as "proud *Hippemolgi* (mares-milkers), *Galactophagi* (milk-eaters) and *Abii*, men most just, but he calls them *Abii* more especially for this reason, that they live apart from women". The custom of abstaining from eating any living thing was still observed in Strabo's time (1st cent., B.C.).

I have mentioned what these two very well-known ancient authors said about the religious life of Dacian people to understand better how Christianity spread among them. As we have seen, their strong religious beliefs were mentioned by many authors from Homer to Josephus (1st cent. A.D.) a time span of about one thousand years. Furthermore, the similarities between the Dacian caste of priests and the *Essenes* mentioned by Josephus help us to understand how Christianity spread among the Dacian people. On the other hand, it is well-known that the first Christian communities were similar to the community of the *Essenes* from many points of view. I will not go into these details since they are well-known among theologians and other scholars.

After this short introduction regarding a few basic historical facts, I will go further to analyze some of the most important lexical data denominating notions of the Christian faith. I would like to mention from the beginning that I will discuss the oldest Christian lexicon which is coming either from Latin or Dacian, terms that define the fundamental aspects of Christian belief. This paper is not concerned with the lexical elements regarding the administrative structure of the Orthodox Church.

These are, in general, of Greek or Slavic origin and they are quite straight-forward and present no special etymological difficulties.

Starting with the Romanian names for all seven days of the week and all twelve months, they all come from the Latin language, none of them pose any etymological problems. Also *Paşti* "Easter" is the plural form of *pască* from vulg. Lat. *pasqua*, of Hebrew origin.

The word for church, *biserică* (mr. *băsearică*, mgl. *băserică*, istr. *baserike*) is derived from Lat. *basilica*, itself from Gk. *basilikon*, also found in Vegliote *bašalka* and Reto-romance *baselga*. The word is not found in any other modern European language. Even Albanian derived the word for church from Lat. *ecclesia*, not from *basilica*. Based on these data certain scholars from 19th and early 20th centuries concluded that Romanian people have their origin south of Danube River, a theory with political implications at that time, but its details do not concern us here. In fact, these scholars never mentioned the Vegliote and Reto-romance forms, perhaps they were not aware of them, but the very existence of these forms undermines their theory.

Romanian *înger* "angel" is coming from Lat. *angelus* which is of Greek origin *aggelos* "messenger", found in all Romance languages and in other European languages. The verb *a boteza* "to baptize" derives from Lat. *baptizare*, further from Gk. *baptizo* "to baptize". The simplification of the consonantal group *pt* to *t* created some controversies among scholars, because the group *pt* is quite frequent in Romanian. I will not discuss this further, but I would mention that the reduction of *pt* to *t* is due to the process of dissimilation between the two bi-labials: b from the initial syllable and p from the following syllable.

Romanian *mormânt* "grave" is considered to come from Lat. **monimentum* Lat. *monumentum* (Densuşianu, Hlr., 193; Puşcariu, 1109; Candrea-Densuşianu, 1153; REW, 5672). I consider *mormânt* to be a derivation from *morman* "pile", similar cu Sard. *morimentu* "hillock, pile" and. prov. *morimen* "hillock". All these forms seem to be of pre-Roman origin. Also *groapă* "hole (in the ground)" which is cognate with Eng. *grave*, both

have their roots in PIE **grebh-*, *grabh-* “to dig, to scratch” (Pokorny, 455); cf. Goth. *graban* “to dig a hole”, O.H.G. *graban* “to dig”, O.E. *grafan*, Eng. *grave*, O.C.S. *pogreti* “to bury”, Lithuan. *pograban* “hole in the ground”. From *groapă* derives *a îngropa* “to bury”, along with a *înmormânta* “to bury” from *mormânt*.

The Romanian word for “believe”, *a crede* was derived from Lat. *credo, -ere* (Puşcariu, 411; Candrea-Densuşianu, 404; REW, 2307). The root is found also in Celtic languages; cf. O.Ir. *cretim* “I believe”, Welsh, *credaf*, Corn, *crežy*, , M. Bret. *criddif* “to believe” from a proto-Celtic root **kreda* (Walde, 1, 287). In other words, Lat. *credo* and the Celtic forms all come from a common Indo-European form. There is a good chance that it may have existed in the Dacian language also. According to my data Thraco-Dacian, Illyrian, Celtic and Italic languages shared a common ancestry till the end of the 2nd millennium B.C. and, therefore, they shared many lexical items and phonological features. The Romanian word for religious belief, *credinţă*, does not have a direct correspondent in Latin, but it corresponds to Sarde *credença* and O.Fr. *credence*, borrowed into English, credence. The Rom. suffix *–inţă* of *credinţă* is also found in words of Thraco-Dacian origin such as *velinţă* “blanchet”, therefore, it has a pre-Roman origin. The noun *credinţă* is an internal derivation of Proto-Romanian. Extremely interesting is the word for “godfather”, *cumătru*, which is also found in O.C.S. *kŭmotrŭ*, but also in med. Latin *commater* “godmother” mentioned for the first time by Gregorius of Tours (6th cent. A.D.). From it derive Fr. *commère* and Sp. *commadre*. Similar forms are to be found in Slavic and Baltic languages; cf. Bg., Scr., Russ. *kum*, Lituan. *kuma*, O. Pr. *komaters* “godfather” and Alb. *kum*. All these forms tell us that an older Indo-European root underlies all of them, a PIE **kommater* from *māter* ‘mother’ (Pokorny, 700). The Old Prussian form is close to the med. Latin, Romanian and Old Bulgarian forms, but they cannot come from med. Latin. Speakers of Proto-Romanian had not any linguistic contacts with Medieval Latin.

Furthermore, the Romanian word for "fast" *post*, is considered to come from O.C.S. *postŭ*, but from phonological point of view it cannot be inherited from Common Slavic, because this language did not accept closed syllables. A closed syllable is one which has a consonant in its final position. The first syllable in O.S.C. *postŭ* is closed and therefore, it was borrowed from another language after the Common Slavic process of having all its syllables open ceased. The form appears also in O. Pr. *pastautan* "to fast", which also cannot be of Slavic origin from the very same reason. There are similar forms in Germanic languages; cf. got. *fastan*, O.H.G. *fasten*, O. Norse *fasta*, O.E. *faestan* and of course, mod. Eng. *fast*. All have the same meaning. Kluge (278) derived the Germanic forms from PIE **pwosto* "pure". Rom. *post*, as well as old Prussian *pastauton* along with the Germanic forms come from the same Indo-European root. Slavic languages have borrowed it from Proto-Romanian when they converted to Christianity. Also, this is not the only Christian term in the Romanian language (some of them are coming from Latin) that is found in O.C.S. or other Slavic languages. There is no doubt that the Romanian language inherited it from Dacian. As I have shown above, Dacians used to abstain from certain kinds of food long before they accepted Christianity. Going further, Romanian *sfânt* "holy" was derived from O.S.C. *svętі*. Both this forms have cognates in other IE languages; cf. Avestan *spəntа* "holy, sacred", O.Pr. *swenta* holy, sacred", Lithuan. *svent* "holy" (*ugnis sventa* "sacred fire"),", Lett. *svinet* "to sanctify", Hitt. *spand* "to pray, to make a sacrifice", Lat. *spondeo* "to take a solemn vow". On an ancient inscription found in Bulgaria in the last century dedicated to Apollo, we find the form "*Apollo Spindenos*" (cf. Vinereanu, 180) which should mean "the holy Apollo". From many other Romanian words we know that PIE **p* followed by a front vowel such as *e* and *i* affected the consonant turning it into an *f*, thus a Dacian **spintu* or **spintu* became *sfânt* in Romanian. Lat. *sanctus* has a different origin and I will not go into further details. It is extremely interesting that in Romanian exist also the form *Sân* or *Sântă* derived from Lat. *sanctus*, *sancta*, but they are used only

together with the name of Christian saint, in frozen expressions such as: *Sân Pietru, Sâmiedru, Sân Văsâi, Sântă Mărie*, etc. These forms cannot be used independently as *sfânt* can be used. In a similar restrictive way is also used Rom. *cumineca* "to partake in the sacrament of Eucharist" and *cuminecătură* "the sacrament of Eucharist". The latter is an internal derivation of Romanian having no correspondent in Latin. The verb *a cumineca* was borrowed from Lat. *communicare* which in Latin has many different meanings, among them are: 1. to share; 2. impart information, to communicate, etc. None of these meanings appear in the old Romanian form. In Romanian, there is a different form also "*a (se) împărtăşi*" which is an internally derived word from *parte* "part" prefixed with *în* (*îm*). In contrast with *a cumineca* which has a restricted meaning, *a împărtăşi* "to share" has a more general meaning which overlaps with the one of Lat. *communicare*. Modern Romanian has also *a comunica* "to communicate" which is a modern loanword borrowed from French, having the meanings found in Lat. *communicare*. In a similar manner is used the form *părinte* "parent, father", from Lat. *parentem*. Romanian *părinte* is not always interchangeable with the form for father, *tată* and for mother, *mamă*. The form *părinte* is used when someone addresses a priest: Părinte X "Father X", but is never interchangeable with *tată*, as in English, for instance. After almost 2000 years a native speaker of Romanian "knows" that these two words come from to different sets: *părinte* in is a Latin word, meanwhile *tată* is of Dacian origin. A native speaker of Romanian will never address his father with the appellative *părinte*, but he will use the other one, namely, *tată*. Although the word *părinte* is often used for the biological or adoptive parents, mostly in its plural form, referring to both parents or to parents in general, in the same way this term is used in English in its plural form. Romanian *tată* traces its roots back to PIE **tata* "father" (Pokorny, 1056) which, according to Pokorny, comes from children language; cf. Skt. *tata*, Hitt. *atta*, Goth. *atta*, Cymr. *tad*, Corn. *tat*, lett. *teta*, Lithuan. *tetis* , O.Pr. *thetis* "grandfather", Alb. *tatë*, *atë*, etc., Lat. *tata*, etc. Lat. *tata* is an affective appellative

used mostly by young children, I would say, similar to English *daddy*. Romanian has also the form *tete* (*tite*) used as appellative of respect for an older brother or other male relative, but it can be explained only through Dacian. Rom. *tete* may be associated with Lithuan. *dede* "uncle", Alb. *dede* "uncle" and Russ. ded "uncle". Also the word *preot* "priest" of Latin origin **prebiter* (*presbiter*) is a parallel form with *popă*; the latter has a slight pejorative meaning. Alternatively, Rom. *popă* is frequent in Romanian onomastics in family names such as *Popa*, *Pop*, *Popescu*, *Popeanu*, etc. It is considered to come from O.C.S. *popŭ*, but in this case, it would be pronounced *pop*, not *popă*. Lat. *popa* means "a lower rank priest" in old Roman religion and it is considered to be of Etruscan origin (cf. Walde), although it may come from another Italic IE language, since Lat. *popa* seems to be cognate with Gk. *pappas*. The differentiation between *preot* and *popă* may go back to Latin and the pejorative meaning of *popă* may be embedded in the Latin meaning "of lower rank priest", if it was not in Dacian as well. Also Romanian *păstor* from Lat. *pastor* "shepherd" has not the meaning of "shepherd" in the traditional language, for which Romanian has a different word - *cioban*. In Romanian, *păstor* is used only in the spiritual sense, along with its derived verb *a păstori*. In modern Romanian the word *păstor* with the meaning of "shepherd" is a cultivated word. On the other hand, the word *cioban* is never interchangeable with *păstor*. The expression "*păstorul cel bun*" (the good shepherd) referring to Jesus cannot be replaced by "*ciobanul cel bun*" (also the good shepherd, only in its usual meaning, not in any spiritual sense). According to my data, *cioban* is also of Dacian origin coming from PIE **keu-*, *skeu-* "to watch, to look at to look after" (Pokorny, 587); cf. Skt. *kava* "intelligent, poet", Gk. *κοϵω* "I watch, I hear", Lat. *caveo* " to be careful, to take care", Lett. *kavet* "to hesitate", Sb. *čavati* "to watch, to take care of". Further, I will make some observations on two other words which are metaphorically used for Jesus: *miel* "lamb" and *mire* "bridegroom". Romanian *miel* is considered to come form Lat. *agnellus* "little lamb" (Puşcariu, 1070; Candrea-Densuşianu,

1100; REW, 284); cf. it. *agnello*, prov. *agnel*, fr. *agneau*. Phonologically speaking, there are some difficulties in deriving *miel* from this Latin word. Practically, it should yield the form **amniel*, not *miel*; there is no obvious reason for the deletion of the initial *a*, and also, it not clear why the group *mn* was simplified to *m*. Conversely, PIE **melo* "small animal" (Pokorny, 724) does not pose any phonological problems; cf. Gk. *melon* "small animal, sheep", Welsh, O.Corn., Bret. *mil* "animal", Arm. *mal* "sheep", Goth. *smals* "small", O.H.G. *smal* "small", O. Bg. *malŭ* "small".

Furthermore, the origin of Romanian *mire* "bridegroom" and *mireasă* "bride" has generated many controversies. Hasdeu considers it to be of Dacian origin, others give it completely different origins: Lat. *miles* "soldier" (Papahagi, Notiţe, 36; REW, 5568; Rosetti, 1, 169), Turk. *amir* "leader" Pascu (2, 108) or Cuman. *mir* "prince" (Philippide, 2, 378). Semantically, all these forms have nothing in common with Romanian *mire*, respectively *mireasă*. According to my data, Rom. *mire* comes from PIE **merio* "young man", having also a feminine form, *meri* "young wife" (Pokorny, 738) with many cognates in different IE languages; cf. Skt. *marya* "young, man, lover, fiancé", Crimean Goth. *marzus* "wedding", O.Pr. *martin* "bride", Lithuan. *marti* "bride". Romanian *mireasă* "bride" is used metaphorically for a nun in expressions such as *mireasa lui Isus* "the bride of Jesus".

The Romanian word for "devil", *drac*, was believed to come from the Lat. *draco* "dragon". The root is found in many languages such as Baltic and Celtic languages having the same meaning as in Latin. With the meaning of devil, it appears in Gk. *drakon* and Alb. *dreq*, both Balkan languages as Romanian. We may assume that Romanian inherited it from Dacian, being cognate with Lat. *draco*.

Very interesting is the Romanian term for "Christmas",. Crăciun (mr. Cărţun, Crăciun, mgl. Crăciun) has created many controversies. Some scholars believed that it has its origin in Lat. *creatione*(*m*) (Densuşianu, Hlr, 262; Pascu, 1, 69). Some argued against this etymology saying that Lat. *creatione*(*m*) would yield **Creciune*, not *Crăciun* (Rosetti, BL, 11, 56). Phonologically

speaking, the argument is correct, and also from a theological point of view, the hypothesis is wrong, because, according to Christian belief, Jesus was not created or born as any other human being, but he pre-existed to his earthly birth as the Son of God, as the Christian Credo says (cf. Ciorănescu, 2524). Other scholars, among them Puşcariu (407) believe that the form should be derived from Lat. *colationem* "the first day of each Roman month when the pre-Christian priest announced the holydays of the current month", also phonologically inadequate because it should have been **Coraciune*. There are also a few other hypothesis which I will not mention here. In contrast, it is important to mention that *Crăciun* is found in all Balkan and some of the Central European languages; Bg. *Kračun*, Scr. *Kračun* (proper name), Hung. *Karačon* (Christmas and proper name), Cech. *Kračun*, (Christmas). Some scholars hypothesized that *Crăciun* is a Slavic word derived from O.C.S. *kratŭkŭ* "short" or O.S:C. *kračati* "to step" (Cihac, 2, 79; Philippide, Principii, 17; Weigand, BA, 3, 98; Vasmer, 633). Vasmer, also, doubts that this word could be of Romanian origin because it is attested in *Nestor's Chronicle*, written around 1140 A.D, *koročun* "winter solstice, death" but in fact, the term must be much older. On the contrary, Eastern Slavic languages use different forms for Christmas, not anything like *Crăciun*. Thus, Vasmer's hypothesis seems inadequate, since the Eastern Slavs had cultural and linguistic contacts with Proto-Romanian people long before 12th century A.D. In my opinion, Crăciun is neither of Latin, nor of Slavic origin, since both these languages have no appropriate etymons for this word. The oldest attestation found in *Nestor's Chronicle* has the meaning of "winter solstice" and "death". In Romanian there is also a verb a *crăciuni* "to shed blood, to kill". Ciorănescu (2524) argues that this should be in connection with the extremely wide-spread Romanian custom of slaughtering pigs before Christmas. On the contrary, I believe that this custom has its roots in a pre-Christian ritual of sacrificing animals on certain religious holydays, a common custom in many other ancient religions. Furthermore, the custom of slaughtering baby-lambs on Easter,

still practiced in Romania and other neighboring countries, has a religious meaning that can be directly connected with old Jewish custom of slaughtering baby-lambs just before Passover. It is obvious that the original meaning of *Crăciun* should be connected with the "winter solstice", when the old year dies and the new one is just born. We simply do not know the date when Jesus was born, but it is certain that Christmas has its origin in a pagan holyday which celebrated the birth of a solar or vegetation divinity and which was held at the winter solstice. It is also known that at winter solstice was celebrated the birth of *Mithra*, a solar Iranian deity whose cult was widespread in the Roman Empire in the first centuries of the Christian era. Taking into account the area where *Crăciun* is found, namely, in the Balkan region and in Central Europe, I would say that it derives from the name of a Dacian feast celebrating the birth of a (solar) divinity, possibly the birth of Zamolxis himself, the supreme Dacian deity, or another divinity who symbolically revived every year. Herodotus tells us that Zamolxis entered into a cavern to reappear to his followers after three years. They believed him dead and when he reappeared they thought he was among the dead and resurrected. After this experience, he convinced his followers that there is not such a thing as death, a conviction that had become a key element in Dacian religion. Most ancient authors mention that the Dacians believed that they were immortal. On the other hand, the parallel between Jesus' death and resurrection, after three days and the death and resurrection of Zamolxis after three years is pretty obvious, but I will not go into further details.

Regarding the etymology of *Crăciun* it should be derived from PIE **ker-*, *kero-*, *kre-* "to grow, to rise, to make grow, to develop" (Pokorny, 577). The suffix *–ion*, found also, in *Kogaion*, is cognate to the Lat. suffix *–anus* and other similar forms. It attaches to the root **ker-*, **kre-* yielding **Kerkion* or **Krekion* in Dacian and *Crăciun* in Romanian without any phonological difficulties.

Contrary to a general belief that Romanian *Dumnezeu* "God" is coming from Lat. *domine deus*, this term is a quite recent

creation in the Romanian language, perhaps in the late 18th or early 19th century. The oldest Romanian religious texts from 16th century use the form *Zăul* for "Dumnezeu". Romanian *zău*, *zeu* "god" is considered of Latin origin, from Lat. *deus* (Puşcariu, 1929; REW, 2610; Ciorănescu, 9468) from PIE **deiwo-* (Ernout-Meillet, 171) having forms in most IE languages; cf. Skt. *devi* "goddess", *dive* "day", Lithuan. *dievas* "god", O.Ir. *dia*, Arm. *tiv* "day". In most of these languages as in Latin and Romanian, this PIE root yielded forms in various IE languages meaning either god or day or in most cases meaning both. Regarding the Romanian language, if we derive *zeu* from Lat. *deus*, then we cannot explain *zână* "goddess" because phonologically speaking Lat. *dea* "goddess" cannot give us *zână*. Romanian historical linguists tried to solve this inconsistency deriving *zână* from Diana. In my opinion this hypothesis is wrong since Diana is a proper name, and secondly it would be *ziană*, not *zână*. Therefore Romanian zână comes from an older forma *dena. I have to mention that Rom. *zeiţă* "goddess" was coined in the early 19th century after *zeu*. By the same token Romanian *zi* (or *ziuă*) "day" has not its origin in Lat. *dies*, but in Dacian as well; its form is closer to Skt. *dive* "day". Romanian *zeu* is attested in the name of Thraco-Dacian divinities such as: *Saba-zios* (also spelled *Saba-dios*), *Gebelei-zis* and *Zamolxis* (also spelled *Zalmoxis*, *Zamolxios* < *Zamolk-zios*). Furthermore, Gk. *Zeus* cannot be explained through Greek phonology, but through the Thraco-Dacian one, a fact neglected by most scholars, because very few of them are familiar with the phonology of Thraco-Dacian which can be understood quite well studying the Thraco-Dacian glosses along with the lexicon of modern Romanian. The name of the supreme Greek divinity derives from the same PIE root as Lat. *deus*, and other similar forms in many other IE languages, but PIE **d* never turns into *z* in Greek, except for this particular case, but such exceptions cannot be explained. The Greek sound *z* comes from different IE sounds such as *i* which is a glide (such as English *y*); e.g. Gk. *zugon* "yoke" from PIE *iugo-m (Pokorny, 508); cf. Skt. *yuga*, Lat. *iugum*, Got. *juk* "yoke", O.H.G. *juch*, Lithuan. *jungas*

"yoke", etc., or from PIE **g* as in *zoo* from PIE **gwiuo-* "life, alive"; cf. O.Sl. *živŭ.*

To sum up, we may conclude that old Romanian lexicon regarding different religious notions come either from Latin or Dacian, a language related to Latin and other old Italic languages. In the same time, at least some communities of Thraco-Dacians (or Proto-Romanians) had become Christian quite early, in the 4th and 5th centuries A.D. In this period the Byzantine Empire was ruled by emperors of Proto-Romanian origin such as Justinian and Justin and many others before them, who were dedicated Christian emperors. It is well-known also that the great majority of the population in the empire was of Thraco-Dacian origin. As we have seen, in many instances that we have pairs of words with the same basic meaning in Latin or Dacian, but most of the time they are not interchangeable in Romanian as it happens in modern English with words of Germanic and respectively of French origin. Historical phonology is a powerful tool which enables us to understand not only the evolution of words throughout history, but also to understand their social or spiritual meanings and therefore, to separate words or sets of words of different origins even when the languages they coming from are (closely) related.

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