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**THE FACULTY OF ORTHODOX THEOLOGY**

**PhD Thesis**

*Theological Sense of Science*

**ABSTRACT**

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## PhD Thesis Abstract

This PhD thesis named "*Theological Sense of Science*" is an overview of the relationship between theology and science, in the context of a synergistic collaboration of the two areas of human knowledge.

From a structural point of view, the paper includes an introduction, and the following chapters: "*The scientific dimension of theology and theological dimension of science*", "*Scientific discoveries as «revelation» of God; The scientist as a tool of God*", "*Biblical and scientific inspiration*", "*Enlightenment and genius; Theologian and scientist – Saint and Scholar*", "*A theological interpretation of the great scientific discoveries*", "*Philosophy of science and theology of science*", the final chapter, "*Immanent God in microcosm and macrocosm*", concluding remarks and work references.

Analyzing the content of the paper, it is easy to see that the relationship between theology and science is viewed and discussed from both methodological and phenomenological aspect. To highlight the ideas set forth, we compiled a detailed presentation of the contents of each chapter.

The introduction of the paper expresses the purpose of the work, the means used, the arguments (both theological and scientific), as well as the novelty and the current character of the thesis.

As mentioned in the introduction of this thesis, the goals set were: to reflect on the theological dogmas in the mechanism of natural phenomena, to draw the theologians' attention to the constructive and the friendly message of the scientific endeavour to faith, to highlight a few traits of the scientists' that could find a resonance in faith, and to encourage them to receive the truth of the Christian revelation.

Among the means used to achieve the proposed goals we mention: description, explanation, extrapolation and symbolic parallelism.

With respect to the aforementioned arguments, we addressed both the theological (scriptural and patristic type) and the scientific arguments (personal testimony of scientists and interdisciplinary descriptions with reference to scientific phenomena).

Finally, also in the introduction, we highlighted the novelty and topicality of the theme through more active involvement in the natural phenomenology, and underlining of the scientific connotations found in the philosophical and theological message of St. Maximus the Confessor.

Going forward, in the first chapter of this doctoral thesis, entitled "*The scientific dimension of theology and theological dimension of science*", we explored the methodological link between theology and science, materialized by a "communication" of some characteristics of epistemological nature. We highlighted those common characteristics, either through retrieval of some properties of science into theology, or by presenting them as a result of their reciprocity.

The leading characteristic among the epistemological common features of theology and science is their fundamental axiomatic character.

In this regard we showed the principled indemonstrability manifested in both: dogmas (which are revealed), and mathematical axioms, postulates and physical principles (which are experimentally certified by phenomena reproduced in the laboratory - "The Phenomenon" through its semantics suggesting a revealed origin).

Another epistemological similarity we noted was that of manifestation of the rationality both in the scientific message and in the development of the fundamental theology, of course, on the dogmatic "foundation" that was revealed.

Thus we have shown the beneficial need for a logical thinking supported by both important theologians and valuable scientists. In this context, there were unearthed and the scientific concerns (highly qualitative) of the Fathers' like St. Basil, St. John Damascene, St. John Chrysostom, St. Ambrose the Great and St. Maximus the Confessor.

Other common cognitive elements of the two fields of knowledge, as revealed in the first chapter of the work, are faith (or confidence in the veracity of affirmations), and apophatic and antinomic character of the scientific and theological assertions.

Another epistemological link noted in this interdisciplinary context, was highlighted by theologians this time, and it refers to the dogmatic essence retrieval of the formulations of faith (such as describing the principle of the union of the two natures of the Saviour) in scientific expressions (such as physical expression in the particle-wave dualism), which is a theodicy of the cosmos.

In addition, other elements of epistemological connection are: the need for practical manifestation of theology and science (in theology it is well known the need to experience God, such as the practice to pray which is a criterion of quality authentic theology, while in scientific theories experimental validation is provided to express the truth of a theory), the transcendence of the object of knowledge (in theology is being asserted divine transcendence, while in the knowledge of nature there are recognized the infinity and inaccessibility, and so the transcendence of what is unknown) and the use of the model (in theology the model of Christ who "converts", reality being attracted to Him, whereas in science there is the theoretical model that approximates the reality in a desire to describe it as satisfactorily as possible).

Besides the above, the two areas (theological and scientific) have also in common their concern of seeking absolute truth, through the common source of inspiration (that being the divine grace in theology and inspiration in science, which is not foreign to God's will ) and the duality of manifestation through conservatism and dynamism (if Holy Tradition is the constant

and dynamic appearance in theology, the laws of conservation are constant in science, while the dynamic character is provided by the new discoveries that are made).

The second chapter, *“The Scientific discoveries as «revelation» of God; The scientist as a tool of God”*, is subdivided into four subchapters.

The main objective of the first three chapters was to stress that discovery through faith is no different from scientific discovery. If in theology the discovery is revealed, God by His grace being The One that informs people about the message that conveys their salvation (stored in the Scripture's and Tradition's treasures), in science thought or innovative idea is what triggers the discovery itself; and they, somehow, are both related to revelation and, thus, to the will of God. In addition to arguments coming from scientists, the revealed character of ideas is supported by some theologians as well. Based on these statements, the fourth subchapter comes somewhat naturally to continue the aforementioned subchapters; it promotes and assigns the scientist as "an instrument of God." This assignment, more difficult to accept at first sight- especially due to the fact that the discovery made by the one involved in scientific epistemology is not always complete, or is not used only for the good of humanity, or the discoverer does not have faith, perhaps, not even a moral living style - is reinforced, however, by comparison with biblical examples, such as when the sorcerer Balaam who, being summoned to curse the Israelites by Balak king of Moab, blesses them instead and predicts the birth of the Messiah within the chosen people (Num. 22-24). This comparison seems quite appropriate because, as the sorcerer Balaam came to harm the holy people and yet he received divine revelation, blessing instead of cursing, so the scientist who, may be not the man of God due to his lack of faith or morality, may still have part of divine revelation in science, and his discovery (by virtue of his free will) can be used for good or evil. So God can bless or punish the world through discoveries He gives to the scientist who thus becomes an instrument in the hands of God. Even through imperfect scientific discoveries the divine will of God is manifested, because this way He may want to challenge His people or He may want them struggle more in order to receive the perfect discovery. Perhaps, He may have already revealed them everything, but they do not realise what gift they have received because they did not "see" it; it means they did not understand their discovery due to the “darkness” in their minds. All these support the concept that both, scientific discovery and its quality are close related to "the right time arrival” and everything is a manifestation of God's will.

The "red thread" of the second chapter leaves room to the third chapter entitled "biblical and scientific inspiration," where, in the first part the theological inspiration is customized and restricted to biblical field, for being compared with scientific inspiration. In our opinion, this approach is quite interesting because the features of Scriptural inspiration are to be found in the

case of scientific inspiration as well. Thus, if in theology the divine inspiration takes the aspect of divine exhortation through which the chosen ones are determined to fulfil God's will, that of the communication of the things to be transmitted and divine assistance to avoid writing errors, the same features embrace the scientific inspiration.

Reference to the sacrifice and the clean life of the Biblical writers, was also made in the first part of the third chapter; those traits are true (in a certain way) for those scientists who, being caught in the "fever" of their findings were able to manifest sacrifice, asceticism and renunciation of the regular pleasures. Regarding the clean life (which requires great effort), this could be equivalent to exceptional intellectual preparation that scientists should have (the absolute necessary condition), because only then the discovery process can take place.

In the second part of the third chapter we presented closely interrelated elements of Biblical, patristic and scientific cosmology contained in the book of "Genesis". Basically, this hermeneutical approach wanted to promote a point of view in interpretation of the world in six days of Genesis as closely related to both theology and relativistic physics, whose precepts mention the relativity of time and space to a chosen system reference.

Approximating metaphysically and metaphorically the heavenly world and the fallen world on two physical reference systems in which time (and simultaneity) are relatively, it has been proposed the over temporality theologúmena of the act of creation (when the two systems were being united) whose stages - in fact taking place out of time - are presented and perceived by the modern world, which is a prisoner of the temporality, as simultaneous then (when Creation took place), and chronological successive now (after the Fall) with a potential evolutionary tint (tint that relates only to perception, not to the reality of taking place). Thus, instant creation of everything that exists (the days being considered stages of the same creation) is seen in the fallen world system (historic world) as being held in time (as days gain a chronological understanding in the context of the current world). Taking into account this theologúmena, among several cosmological models, we have chosen the model of the Big Bang, for a larger debate. This choice is justified in the spirit of the aforementioned idea which states that the amount of timeless creational events (actually understood by us as simultaneous), after the separation of the two systems (as consequence of the Fall) becomes an amount of chronological events. The reason of choosing the Big Bang model is not doctrinal, but subjective; our thesis being no focused on generalizing this model in our thesis as long as its evolutionary component is well-known. Those being said, the aforementioned ermíneia was intended to reveal the stages of the announced model in the days of creation, ideas and assertions having the endorsement of the Holy Fathers, of course.



The fourth chapter, called *"Enlightenment and Genius; Theologian and Scientist - Saint and Scholar"*. Whether the similarities of the epistemological means and methods from the fields of theology and science have been debated so far, the fourth chapter confronts the protagonists who are the subject of the two types of cognitive activities: theologian and man of science. Moreover, the similarity goes even further, maintaining the hierarchical quality scale; as long as there is a similarity between the theologian and the scientist, their superlatives, the Saint and Scholar, are equally similar.

In the first subchapter of this part of the thesis, there is a debate related to enlightenment and genius, the two states wearing psychological-intellectual common issues, but assuming different nuances such as the difference between the outpouring of light that fills the holy soul and the spark that enlightens the scholar's reason.

The next subchapters highlight similarities and differences between the two exponents (theologian and scientist), stressing on their traits and virtues, their means, their goals and the results they achieved. In the first category (that of the traits and virtues), we distinguish - in a psychological-spiritual report - various pairs of gifts of the soul that are analyzed both in terms of what unites them and in terms of what distinguishes them; they are: intelligence and wisdom, sacrifice and asceticism, modesty and humility, passion and dedication.

A similar analysis is focused on the means used by both, the theologian and the scientist (measurement and prayer, experience and living through God, rational involvement and spiritual involvement, discovery and contemplation, experimentation and revelation), as well as their goals and the results they have obtained (knowledge of natural and theological, satisfaction and fulfilment, improvement and perfection, prediction and prophecy, mutual responsibility).

The fifth chapter of the paper entitled "A theology of the great scientific discoveries" is the representative chapter for demonstrating the involvement of theology in the interpretation of scientific phenomenology. Naturally, it is subdivided into scientific disciplines: astronomy and astrophysics, biology, chemistry, physics, geography, mathematics, psychology (psychoanalysis) and anthropology; their message is analyzed in terms of hidden theological meaning

Related to astronomy and astrophysics, the first reference was to cosmology and the models used, further attention being paid to the Big Bang theory, not from a reason connected to veracity but for the simple reason that scientific cosmology considers it as the most acceptable and appropriate in describing the universe. Analyzing these fields of science, we have also highlighted: a theological meaning of gravitational attraction, another revealed by the geoseologic evolution from geocentrism to heliocentrism, as well as the existence of the anthropic principle in the scientific analysis (promoted by theological message too), principle

according to which the universe we live in is perfectly adapted and favourable to life, scientific theory that actually reveals the manifestation of divine providentially.

With respect to the theological meaning hidden in the message of biology, the first reference we made was, naturally, related to the miracle of life. Covering this issue we highlighted the mysterious difference between non-living and living, boundary that marks the limit of action of the determinism despite few attempts to explain the living world through the complexity of the macromolecules, and through the impressive amount of information stored in the living structure.

This inability of biological science to define and describe the living, fully corresponds to theological description according to which spiritual coexists with material. Another topic of theology-biology interdisciplinary analysis was the cell and cloning method. A theological sense of division and multiplication of cellular mechanisms (which is also present in the phenomenon of reproduction) is found by comparing closely with the Genesis biblical essay of creation of man and woman.

A theologically point of view was given related to cloning, being spotted its unethical and immoral character of this method in replicating organisms, but there were also drawn some conclusions (they may be of interest) with strict reference to natural cloning mechanism which has a specific and undeniable biological functionality.

Carrying the interdisciplinary theology-science report in the field of biology, one could not avoid referring to the theory of evolution that we do not support, and we, hopefully, brought relevant arguments to argue against. The first argument lies on the unnatural fundamentally role of chance and lack of meaning characteristic to evolutionism. The important place given by the evolutionism to mere chance as the "engine" of development and biological perfection cannot be theologically accepted either by logic or by moderate common sense. In addition to that, there can be accepted neither the lack of sense of chance, nor lack of target or goal; as any natural mechanism has a definite purpose. In fact the whole argument is supported from both theological and scientific point of view. Another argument against evolutionary theory was the unprincipled or incomplete foundation, where we noticed the generalization of the assumptions (such as "the argument" of the humanoid skulls of monkeys and men, intermediary sized, which generated the idea that intelligence depends on the size of the brain). We have also added the argument of the gradualism in the complexity of living organisms and material unity of life (based on common genetic elements) which, being although claimed by evolutionists, by far they are not non-theological, but they rather show the material unity of the creation of God. The same items also include different points of view about the evolution as involution or the evolution accepted only as an adaptation (wearing an expression of God's care for the created world).

Referring to chemistry, the first topic discussed was the amazing water-related capabilities, features that clearly differentiate it from other substances and under which water is a vital foundation of life. Closely related to these unique features, we revealed the miraculous powers of water (gifted water) using examples from the Scripture. Among the very special qualities of the water we noted that: water is easily formed and it is very stable; it is divided in terms of pH values in "antagonistic water" and "biological water" (which rotates to the right the substances that crystallize in it and participates in the formation of living structures); it has the maximum density -  $1 \text{ g/cm}^3$  - at a temperature of  $4^\circ\text{C}$ ; by cooling it hardens into ice which - paradoxically - has a density less than the density of liquid water that makes ice float to protect life underwater from freezing in winter; snow is also a bad heat conductor and thus protects crops from frost.

Another example from chemistry, that is under the interdisciplinary study theology-science, is represented by the Mendeleev's table which was first developed with great precision on empirical basis, only later being discovered the theory that mathematically validated the distribution of the basic substances in the above mentioned table. Apart from the fact that the revelation of God addresses to the science both experimentally and theoretically as expressing the same truth, the Mendeleevian table also discovers another interesting aspect in terms of theology: protons and neutrons do not combine randomly, but under a "recipe" respecting certain secret ordinances which lead to the occurrence of well-defined substance. Because these nucleons combination resembles canons through their rigorous ordinances, we called this subchapter "Mendeleev's Table, "the canon" of the chemical elements".

The third subchapter in chemistry refers to the quality of the catalyst to speed up a chemical reaction without it suffering any quantitative variation. Although to some extent there is an explanation of this phenomenon, however it remains surrounded in mystery and makes us think of the mysterious action of grace that helps to salvation without diminishing itself in any way.

Leaving the field of chemistry, the thesis moves further to highlighting theological meanings in physics (both experimental and theoretical issues). The chapter is subdivided taking into account the specialties of physics, namely: classical mechanics, relativistic physics, thermodynamics, optics, quantum physics, atomic and nuclear physics.

We wanted to make the reader aware of a few spiritual meanings of some mechanical events as described in classical mechanics such as: the relativity of motion and rest, inertia, gravity and inertial mass hypostasis and the third principle of mechanics (or dynamics). It is interesting that in order to determine the state of motion or rest of an object requires the existence of a reference point (outside it) to determine the kinematic state of the body (the two

being actually related to this landmark), so the spiritual life requires the confessor's "benchmark" and the Holy Confession (in fact of Christ's Himself) to determine the evolution or the spiritual "rest" of a believer (which is in fact an involution). Spiritual meaning has also been found in the case of inertia, intrinsic property of mass, which opposes to any intention of changing the state of motion of a body. In this earthly life there is a positive sort of "inertia" when the believer goes straightforward, fighting against any temptation to make him deviate from the target of salvation, as well as a negative "inertia", when the sinner does not want to give up sin and vice, finding himself stationary in a state of "death" of mind. If inertia is a property of mass (i.e. related to physicality), the clerical effort has a meaning here when the soul is with the body, and becomes pointless and without any effect beyond, in the spiritual world, where there is only spirituality, while asceticism and repentance are no longer possible. One last theoretical item taken from the classical mechanics theory that also suggests a theological sense is the third principle of mechanics, according to which to any action corresponds a reaction of equal value and opposite direction. Spiritual meaning of this natural law is actually an old Christian principle for "all who draw the sword will perish by the sword" (Matthew 26, 52), and more than that "Judge not, that you be not judged. For with the judgment you pronounce you will be judged, and with the measure you use it will be measured to you."(Matthew 7, 1 2).

Moving our attention to the domain of the relativistic physics (based on the theory of the restrained and generalized relativity) one could find important and beautiful metaphysical bridges to theology. Such a link is the speed of light in vacuum which is a universal constant and unique reference to any other lower speed.

These features can lead our mind to Christ - the "light" of world - Who is a model for the entire mankind. Related to this appreciation it is also the relativity of space and time (in the relativistic theory), for durations of time "expand" and lengths tend to "contract" in a system that moves at a speed comparable to the speed of light relatively to own referential system. Extrapolating to maximum (i.e. the first system would be equal to the speed of light), one could say that time no longer flows and lengths have infinite value, conclusions to which both physics and mathematics reached, and if we rely on these conclusions we can resemble the theological "descriptions" of God's light Kingdom, where time no longer flows and spatial location does not make sense because of the omnipresence. Another detail of relativistic physics (of interest to the present approach) is the unitary conception of space, time and matter which are appreciated in this new vision as a whole, appreciation consistent with theological thinking that presents the world as a unitary creation of God. This close link between the three elements (space, time and matter) has gone further so much as to conclude that where there is no matter, there is no time, nor space, which (theoretically) establishes a border between the material and spiritual world.

Another consequence of the relativistic approach is the space-time curvature near large concentrations of matter, a situation which, in terms of cause, can be understood either that matter curves space-time, or the curvature of space-time continuum generates the matter itself, and that is also a statement in agreement with the theological dogma of creation "ex nihilo".

In terms of thermodynamics, there were exposed some theological interpretations of entropy (exponent of the destructive message), of the quasi-static process (the thermodynamic model that can facilitate understanding and acceptance of potential development under the heavenly), and of the temperature of absolute zero that suggests the total cessation of Brownian movement equivalent to death of all virtues, the spiritually "zero" of Hell.

Theological meanings were also found for physical phenomena in optics where, first, was light became an example (being reviewed in terms of particle-wave dualism) as a clear exponent of the use of antinomy in physical definition and as a means of extending the antinomic character to the particles which (later) were also assigned an information wave. Another shade of natural light of theological interest is that the light was first defined by physicists as a wave and then as a particle beams. With respect to the chronological sequence related to the nature of light (first wave and then particle), in a way it prefigures the spiritual priority of divine rationale that builds and justifies materiality of bodies (according to the theology of St. Maximos the Confessor). Another example of an optical phenomenon with theological interpretation is the laser - the perfect light - which, with ordinary light together, suggests (via properties) light "from above" (of the triumphant Church) that being poured into the world becomes the light "of below" (of the militant Church).

A specialty of physics often used by theologians to argue the harmonious relationship between theology and science is undoubtedly quantum. There are many examples of theological recovery of the quantum mechanisms, in this thesis being mentioned those of uncertainty relations of Heisenberg (with their gnosiological novelty of participation as well as of limiting the knowledge obtained by the observer), the knowledge of quantum (with its antinomic character), the probability (basically characterizing the microcosm of material existence), the properties and the "movement" of the micro-particles, the energy communication from the quantum (reminiscent of the uncreated divine energies that support the material world), and the four fundamental forces (with their foundation, which, theologically, can be easily appreciated as spiritual). These examples, of course, are not totally independent of each other, they are interrelated, having in common the information that dictates the way the microcosm operates and manifests in all the issues presented.

Another physical discipline under aforementioned interdisciplinary approach is atomic, and nuclear physics, and the physics of the elementary particles. In this framework, we have

highlighted the behaviour of the antinomic particles discovered by the scientist Niels Bohr who, in order to explain the stationary state of the electronic orbits of the atom, had to accept the contradictory behaviour of electrons when they are found in their two accelerated states (the free or the orbital state).

Another field of science that has made the point of our research is the geography, where we have drawn the reader's attention to some theological and spiritual meanings. Thus, the spherical shape of the earth reveals perfection (which is consistent with the theological precept according to which God made the world well); its geometry suggests the absence of any privileged point of the land area, promoting the idea of fraternity and anthropological equality. Another meaning is found hidden in the distribution of meridians which join at the poles but otherwise they are distinct, likened the reins of the time we go through in this life and blur into the kingdom of heaven where time is not. Another interesting detail is the seven continents of the earth, number seven being associated to the number of days of creation and the seven fundamental mysteries of human spiritual and material life. Finally, this approach related to theology and geography concludes with highlighting a metaphor about the name of Christopher Columbus - discoverer of America - who, by the meaning of his name, "dove Christopher", had the mission to proclaim Christ to the new world.

Another important area of science (which must be taken into account by any piece of work aimed at studying the theology-science report) is mathematics. Referring to the relationship between mathematics and theology, the presentation was first focused on a historical overview of the Pythagorean School (where mathematics meets mysticism), then, going further, to emphasize the special status and somewhat "spiritual" in the category of sciences of mathematics, bringing the following arguments: mathematics is interwoven with the theories that it describes like body with the soul; mathematics is a judge value by its ability to demonstrate or not theories of physics, chemistry and others; to mathematical disciplines tend other fields of science which the more abstract they get, the more mathematical they become (like matter tends to spiritualize when getting closer to the heavenly things); and also mathematics is the only science without empiricism, because the truths it relies on, do not need experimental authentication, as they are building one another respecting their own rules. Other "spiritual" features of mathematics' are: rationality (or the beauty of mathematics), abstracticism, gnoseologic "transcendence" , "quota-free" gnoseology, multidimensionalism, information as an object of the mathematical processing, "prophetism" (prediction) of mathematics, the "metaphysics" of some mathematical elements (the little infinite, the circle, bijective and asymptote). The Mathematics rationality approaches, undoubtedly, this scientific discipline to theology, as theology has its own rationality as well. Having a look at the two areas in terms of their rationality, we find many similarities such as the

divalent feature of the mathematical logic (with true and false values ) and the theological message about virtue and sin (or about good and evil), the axiomatic basis of mathematics being similar to dogmatic theology, conceptualization of infinity versus contemplation of eternity and, of course, the beauty of mathematical equations compete with the beauty of theological dogmas.

Now, with respect to the "use" of abstract in mathematics, one should note that it exceeds concrete reality; it manifests through operations with surreal notions that ultimately have applicability in the real world (an example is the complex number  $i$  defined as the root of  $-1$ , which is impossible in real terms). This is what happens in theology where the overwhelming argument is the Incarnation of the Son of God, who came down from the transcendent spheres to save in a real and concrete way the fallen world, because, only then, by descending from the Heaven inaccessible to a human mind, that human mind could reach to God.

As we have already said, there is in mathematics a "transcendence" of gnosiological nature, which is an obvious and important connection to theology. A first aspect of this "transcendence" is the existence of the so called "transcendent" numbers which, despite existing in theory, they do not practically manifest, being almost totally excluded from the calculations. Another aspect of the above property is covered by the irrational numbers that cannot be represented by dividing two integers, as the result is given by a comma followed by an infinite sequence of digits. Among the irrational numbers there is the number  $\pi$  which can yet be 'represented' as ratio between length and diameter of a circle.

Another "spiritual" feature of mathematics is that, despite being initiated by human reason, its theories built one another with no need for experimental validation, and thus one could say that - in the epistemological aspect - it "contains its own cause," i.e. it is "quota-free." Similarly, a feature that relates to abstract is the multidimensionality of the sets with which it operates. In this context there are functions that use these sets which, although they cannot be represented in all their large, it is still possible to represent three-dimensionally projections of such "hipergraphics" (otherwise they could be represented in a "space" with more than three dimensions).

Therefore antinomy is just an apparent contradiction because, in spite of being inconsistent in this world, not the same happens in the world "above" (with its multiple dimensions). In the inferior world there may be conflict between the "projections" of the "bodies" from the upper world for that "projections" are perceived in the world "from below" as being completely independent from each other, which does not happen with the essence of "bodies" in the upper world that is a whole. Therefore, in the lower world the 'objects' of the world above can be "dimensionally" understood as "projections" only, because they cannot facilitate a perfect comprehensible understanding of the truth from above to those who live in the world 'below'. With respect to information - the subject of mathematical work, it is well

known that maths works with entities without material support (number, position, set, theorem, axiom, etc.). Mathematics is the field of pure rationality, dealing with no segment of the material world (just like physics, chemistry, biology, etc. do).

Perhaps the strongest expression of the computer nature of mathematics is its use in computer and information technology, for through the ambivalence of its logic, mathematics becomes a base for the information theory. Computer software is based on the numbers 0 and 1, and everything that takes place today in computer science is based on this duality where from it "springs" the amazing diversity of computer applications. Mathematics is for science as information for matter, information that may be metaphysically related to the uncreated divine reasons of things (according to the theology of St. Maximus the Confessor) and, of course, to divine grace that sustains the created world.

An interesting feature of mathematics is its predictive function (which could be called prophetic too). In the paper there are highlighted some examples in which the development of mathematical device was faster than the discoveries in physics, and those new mathematical formalisms were really important in developing new theories. One could say that the utilitarian character of mathematics paved the way to new discoveries made by other sciences that were to occur in "the fullness of time".

Another spiritual "feature" of mathematics is the metaphysical meaning of its elements. Lately, in scientific epistemology two terms have been often used: "the big infinite" and "the small infinite". Despite the semantic contradiction, the two terms refer to the macrocosm and to the microcosm which in mathematics reflects the "numerological" infinite inside the sets, respectively bounded sets. "The small infinite" is based (in the geometric representation resulting from association of real numbers with geometric line) on the axiom that between any two points (no matter how close they may be), there is at least one other point. It follows that any numerical range (however small it may be) contains an infinite number or we could say "dimensional zero contains the numerological infinite", which makes us think of the evidence that the infinite of the spiritual world can be completely free of the material dimension. On the other hand one could observe that the foundation of the "small infinite" that lies on the axiom according to which between any two points there is at least another point, proves a gnoseologic transcendence, but also helps reason "enlightened by faith" to accept more easily (for example) divine depletion of the descent of the infinite and omnipresent Godhead in the limited body of man. Metaphysical meanings are to be discovered in the terms of circle, which is a geometric figure completely defined by its length or by its diameter. An interesting detail is that the ratio between the length of the circle and its diameter is always the same and is equal to the Pythagorean and irrational number  $\pi$  (which preserves its mystery, could not have been described properly). Due to mystery



of  $\pi$  number, circle has a wide representation in religious iconography. Two other items of mathematics of interest in metaphysics as well are bijective and asymptote. Bijective has the ability to associate and to "overlap" the boundless, infinite set of real numbers over a bound infinite interval of numbers and it shows that either eternity can be contained in the margins or the finite can be circumscribed in eternity, becoming obvious the theological connotation of this mingling of eternity with finite circumscribed. With respect to the asymptote it is known that this is a (horizontal, vertical or oblique) straight that is drawn (sometimes) when it is given the graph of a function. Its novelty lies in the character limit it has, for the function graph can get close to this asymptotical straight as much without, however, intersecting with it. Thus, there are two events: approach and non-intersection. These two mathematical events have an obvious theological sense taking into account the theological developments of the transfiguration and deification.

Medicine is another field of science that is the subject of our interdisciplinary and transdisciplinary approach. Speaking of this science we, first, referred to the miraculous and random discovery of penicillin (an obvious manifestation of God's will), then a medicine that has saved millions of lives; after that we showed the presence of an antagonism of antinomic nature that manifests from the basic existence of life in the following couples: assimilation / non-assimilation, homeostasis / transformation, and maintenance / evolution, which are to be found in action at both population and individual levels. Then we pointed out to the ratio between the physiology of organs and their operating mechanism as an antinomic manifestation in the human body, because on the one hand there is a distinction between physiology and functioning, and on the other hand the two are united on the principle that a body is not what it is made up from, but what it can actually do. Other "curiosities" of the physiology of the body continue to reveal theological meanings. One could refer to the aspect of the circulatory and nervous systems, which are known as having a branched organisation. Perhaps this form of blood system and neurological circuits should be an imprint of the tree of life, to which we yearn and which is now guarded by "cherubim and a flaming sword flashing" (Gen. 3, 24), especially since the centres of the two circuits are located in the exact "place" where prayer should work (regaining contact with the tree of life): in the heart (centre of the circulatory system) and mind (central nervous system). Another rather obvious theological meaning is found in the "placebo" where the fundamental role in healing is deep confidence in healing, which, despite being not foreign to autosuggestion, yet keeps to faith. Other references were made to the characteristics and functioning of DNA that is the repository of genetic information. In the same context of genetics, there has been done a comparison of macromolecular structure of DNA with a scale that has four steps (adenine, thymine, cytosine and guanine), in an attempt to highlight that, as the "scale" of

the DNA molecular is fundamental for the body's existence, so the "ladder" of St. John Climacus is fundamental for soul salvation. Moreover, as DNA has four kinds of steps, so St. John Climacus (whose name is closely linked to his work) is commemorated on the fourth Sunday of Lent Easter. Another link between genetics and theology is the theological interpretation (based on Scripture) of the probability of genetic coupling when conceiving a new body, interpretation found also in father Arsenie Boca's thinking, who actually believed that the kind of probability aforementioned is the manifestation of God's will that takes into account the quality of the Christian life of the parents'.

Psychology, psychoanalysis and anthropology are other disciplines we address to in this doctoral thesis. The given description includes a historical aspect to show the main theses defended over the years, supported by Freud, Jung, Pavlov, Galton, as well as those promoted by behaviourism in cognitive and informational psychology; all of these were analysed, of course, in terms of their theological meanings, which is more easily achieved due to the psychological specific of the mentioned fields of science.

Chapter VI of this doctoral thesis is entitled "Philosophy of Science and Theology of Science." The first subchapter of this part describes the cognitive "path" that is based on science, and through philosophy, reaches to theology. To facilitate understanding and acceptance of this epistemological way, the aforementioned section begins with an etymological description of the basic terms of science: theory, experience and phenomenon. This first cognitive step (with an obvious metaphysical significance) is useful because it prepares the reader's mind for overcoming the boundaries of science in an attempt to approach to the revelation of theology; etymology of the three terms drawing attention towards an escape from the "horizontality" of the material world to "verticality" of the spiritual one. Of course, the stated ideas are supported by scriptural and patristic justification, as well as by contemporary authors.

The following subchapter of Chapter VI is intended to describe the philosophical meaning of science, which is more easily found in the case of quantum physics and relativistic. To protect our interdisciplinary approach against deviant dangers, we considered as necessary the explanation regarding the difference between irrational and suprarational, as long as the two issues, although they do not find any understanding (or full understanding) in the space of human rationality, they are still different.

Another important subchapter is the one that shows philosophy (metaphysics) as a bridge between science and theology or as a bridge between the two fields of knowledge. In this respect there have been exposed principles of a new cognitive area (interdisciplinary and / or transdisciplinary) as well as appreciation of some old or new philosophers. Next we considered necessary a typological presentation of scientific knowledge including determinism, probability

(mathematical and quantum) chaos theory (so called because of the huge complexity of the systems it assumes to study), reductionism and holism.

Naturally, as the thematic presentation of Chapter VI showed, after this part of the philosophy of science, the thesis focuses on a subchapter of theology of science. This part includes a "theology" of probability, a theological meaning in numerology, moral and spiritual meanings of science, the five ways of natural contemplation in the vision of St. Maximus the Confessor, and a metaphorical comparison of science and theology with the two sisters Martha and Mary. With respect to the "theology" of the probability it was highlighted the mysterious feature of probability (as opposed to certainty of the determinism) and it was emphasized the dependence of phenomenological determinism from the macrophysics level on the mysterious probability manifested in the quantum microphysics (being made a comparison with the structure of Sacraments that are seen on the one hand and unseen on the other hand, the second component being fundamental and causing the first). An important aspect of the presentation is reserved to the indeterminacy relations that, despite limiting human knowledge, yet reveal other hidden intentions but benevolent because, even if we do not fully know the secrets of natural mechanisms, however the physical world works. So, for the believer God reveals Himself in probabilistic manifestation of quantum phenomena. In fact the same happened in the wilderness with the pillar of cloud and pillar of fire which, although they were a mystery for Israel, they functioned by guiding them not to wander and similarly could be described the meeting of Moses with God, when He had shown as a cloud or as a consuming fire (Ieş. 24, 16-17). An ardent rationalist might wonder how Moses knew that was God, though he never had absolute certainty that God speaks to him, not someone else. But in faith there is no absolute determinism, for demonstrations - by the will of God - do not go through, but leaves room for intuition working by faith. Probabilistic knowledge expresses synergy and teandria (divine and human nature of Christ) as a result of the work of God with man and so one could feel the presence of both. On the other hand, the same probability of knowledge reveals the mystery and divine benevolence, for any manifestation of God is a mystery beyond our understanding, but it is full of goodwill that comes from His love to the world. However, the initiative of knowledge of quantum belongs to man, willing to explore the depths of physical reality, but to this challenge, through specific probability of the quantum microcosm that does not allow the scientist to know everything, God seems to have answered "be as you want, but remember that I have something to say."

As noted above, the work continues with the presentation of a theological sense of some numbers that are important both in theology and in science. The number three - the number of the three holy divine persons - is also axiomatic for the structure of the cosmos, while number four - the number of Holy Evangelists - is the number of rivers of paradise, the four fundamental

forces, etc.; number six resembling the six days of creation is the number of the defining elements of the universe (according to the cosmologist Martin Rees' valuable opinion), and number seven characterizes the seven days of the week, the Sacraments, Ecumenical, as well as being found in optics, music, geography and others, and, finally, the number twelve is the same number of the tribes and Holy Apostles, characterising even the probable dodecahedronic form of the universe (as resulting from measurements made by satellite).

Also in the section devoted to theology of science there were emphasized moral and spiritual meanings of science, arguing, first, on such an attribute of science. Between various examples of natural gnoseology used in the aforementioned sense, we have mentioned: light, atomic excitement and non-excitement, gravitational attraction as well as elements of epistemology (such as the problem of cognoscibility). With respect to the five ways of contemplation present in the thinking of St. Maximus', the Confessor, they were first listed (i.e. the substance, movement, difference or distinction, unity and stability) and then they were explained.

The last topic of the sixth chapter is a comparative and metaphoric presentation of science and theology that are like Martha and Mary, and furthermore a few of the arguments in support of this comparison were listed. First, as Martha and Mary are sisters, so must science and theology be (the aim of this paper being that of revealing the truth to this type of relationship between the two fields of knowledge). As Mary listened to Jesus (at that very moment, without doing anything else) and Martha, who "compelled with much serving" (Luke 10, 40), will meet Jesus later, so theology deals with the word of God receiving it directly through revelation (experiencing God directly), while science studies matter to serve God as well. Mary, listening to Christ preaching, knows there is God and knows what God is like, instead Martha, not listening to the sermon, knows that God exists but she does not know how He is or what He wants. It is actually the difference between supernatural revelation (which gives a personal God) and natural revelation which tells us there is God, but not what He is like. Mary's effort to listen to Him is a spiritual one, and between her and Jesus there is not "borderline", while the Martha's effort is material and for which she "compelled" becomes a border between her and God. So it is with theology and science, for theology has chosen the good side which "shall not be taken from her," and its effort is spiritual, while the science's effort is material. And finally, another important aspect that we find is that Martha asks the Lord to make Mary help her (in order to prepare the material), but Maria does not require Martha's help (in listening and understanding the Word of God). So science should seek the help of theology (it is obviously a need) in the interpretation of the material, but theology, always obedient to God, does not need any help from science in the reception and understanding of the revealed dogmas.

The last chapter of the thesis "The theological meaning of science" seeks to bring arguments (also in the field of theology-science intercommunication) of God's presence in both the microcosm and macrocosm. This argument takes place by highlighting some so-called "projections" of the divine attributes (natural, intellectual and moral) in the created world. Related to the projection of the natural attributes there have been identified appropriate "imprints" such as: the Creational one (the arguments proving that the world is God's creation out of nothing), the Trinitarian imprint (in that number three number characterizes the fundamental principles of the natural world, reflecting in the created world the way in which the persons of the Trinity interrelates), Christological (by that dogma of Chalcedon is a theodicy of the world), pneumatological-the orthodox teaching about the Holy Spirit-(material foundations tend to spirituality), the imprint of the Divine providence (matter is "maintained" by the laws of conservation, by physical constants, and by the presence of the information in the natural elements), eschatological, soteriological, the imprint of omnipresence, and others. With respect to intellectual attributes there were found the "imprints" of omniscience (which is found in the desire to develop scientific theories as comprehensive as possible) and all-wisdom mark (reflected in the rationality and functionality of the world). Finally the last category of "marks" of Deity in the created world is the one resulting from projecting the moral attributes such as: the "mark" of freedom (as the freedom of the material manifested in Heisenberg's uncertainty relations to be or not to be known by man), the "mark" of holiness (the presence of information within the substance, and not only, shows the presence of grace in the material world), love mark (hidden in the phenomenon of gravitational attraction), the "mark" of justice (the principle found in the theological sense of the third principle of classical mechanics), veracity mark (the obvious scientific concern to discover and promote scientific truth) and the "mark" of fidelity (as theological sense of the principle of causality).

The paper concludes with a chapter where reference to the objectives in the introduction was made, as well as to original points of view that have been highlighted and brought into the reader's attention. The conclusions, primarily, focus on the synergy between theology and science (science being meant to work together with theology), and secondarily, on highlighting theological dogmas in the phenomenology of natural (where the thesis has been incisively debated); the main tenets which we referred to were: the doctrine of creation out of nothing and uncreated divine energies dogma, the presentation of elements of philosophy and theology of St. Maximus the Confessor with obvious connection to science, and the last but not the least a message to theologians for a better perception of the authentic values of science, as well as to scientists who are called to faith by accepting divine revelation.

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