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MODERN SCIENCE AND SAINT GREGORY PALAMAS

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Abstract

The dialogue between Science and religion is a thorny issue. On the one hand, Science is an 'objectified' knowledge, verified on a permanent basis by experiment. On the other hand, religion is highly personal. Under these conditions the dialogue appears almost impossible. Yet there are questions and open issues which require a broader perspective, to search for a context involving Science, Philosophy and Theology.
On historical grounds different answers have been offered for our relationship to Nature. According to an ancient Greek proposal, Nature itself is endowed with logos and harmony. Somehow we are met with a deification of Nature. Modernity considers that the human being is the sole source of knowledge and authority (res cogitans) and Nature is debased to an object of study. We explore another option, where the emphasis is on the relation, the interaction which brings together into a communion the different entities. We focus our attention to Modern Science: the Special and General Theory of Relativity, Quantum Mechanics, Cosmology. We realize that a new paradigm emerges, where Nature embodies relational principles. All dualisms are abolished and they are replaced by genuine triadic relations. Our findings resonate with the ideas and notions developed by C.S. Peirce (on evolution, semiotics, relational logic). Furthermore, the new paradigm converses with the old Sophia and gnosis of the Patristic Tradition, notably the methodology of Saint Gregory Palamas. Starting from the fundamental philosophical terms ουσία (substance) and ενέργεια (energy-action-relation), Palamas reversed the usual ordering (substance precedes and energy follows) and he suggested that energy is the primary notion and the one which is revealing substance. The whole Universe appears as a dense web of relations, much in accordance with our present view. Palamas suggests also in a subtle statement, that because of the energy-relation we cannot distinguish the 'observer', the 'medium through which we observe', the 'observed' and 'what is the observed'. It seems that there is an underlying dialogue between Palamas thoughts of the 14th century and the current ideas in Science and Philosophy of the 20th century.

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1. An old argument

Trying to trace the possible connections between Science and religion and build an eventual dialogue between Science and Theology is not an easy task.

1. On the one hand, Science is an objectified knowledge, it is verified on a permanent basis by experiment and everybody accepts the findings or the outcomes of the scientific research.
2. On the other hand, faith is highly personal. There is an infinity of ways to approach God, and the theological language is highly poetic, highly metaphorical and employs symbols, or signs, with multiple meanings. Theology also raises issues like *ethics, telos-goal, free will*, issues that science cannot address.

The first reaction then is to keep these two approaches, Science and faith, apart. The advice is, *do not mingle these two things*.

But the real problem is there and arises in all its force by invoking questions, like:

- If we consider Science as a *sign*, what is the interpretation of this sign? What is the image we obtain about Cosmos from modern Science?
- What is our relationship to nature?
- What is the impact of technique-technology?

This type of questions invites us to look for a wider context, a context involving Science, Philosophy and Theology.

A very important issue is the relationship of the human being to nature.

If we remain within **Biology**, then the human being appears as a product of biological evolution through natural selection (Darwin). Also the human DNA is almost identical to the DNA of the other primates. Therefore Biology places the human being within Nature.

On the other hand, the human being, during the evolution process, created the **language**. Thanks to the linguistic achievements the homo- sapiens managed to register and transfer his knowledge, and furthermore through a 'scientific' language he was able to analyse and interpret Nature. This last development, the human being emerging as the one who expresses the *whole of Nature*, set the human being apart of Nature.

We end up in a paradoxical situation where the human being at the same time lies *within and beyond Nature*. The issue is not only of the highest theoretical concern, but it has also immense practical implications. Directly linked to this paradox is the venerated Nature-civilization clash. The debate is well known: goes back to the Voltaire - Rousseau duel (Voltaire trusting culture and Science, while Rousseau stressing the purity of Nature) and culminates to the present unsettling questions regarding the ecological crisis.

On historical grounds different answers have been offered for our relationship to Nature. According to an old proposal, Nature itself is endowed with logos and harmony. The duty of the humans is to unravel the beautiful, mathematical structures residing within Nature. Somehow we are met with a deification of Nature. This proposal was advocated mainly by the ancient Greeks.

Modernity suggested another approach. The human being is the sole source of knowledge and authority (res cogitans) and Nature is debased to an object of study [1].

Within the western thought and practice, the relation between Nature and the human being, took another turn the last two centuries, through the development of technique and technology. Heidegger in 'The Question Concerning Technology' [2] considers the techni-technique-technology as **poiesis**, the Greek term for creating, bringing forth, revealing the concealed essence. Through the technique-technology we may dwell near the truth of being and fundamentally alter our relationship to being. The role of the humans consists in exercising their freedom, in revealing and unfolding the essence, where during that process we 'should listen but not simply obey'. In the opposite case we end up with an **instrumentalization of Nature and life**: a universe of technical functions replaces the universe of existing and reality comes under the sign of technique.

Both historical models, the paganist model and the modernity model, are actually *hierarchy models*. In the paganist model, we are very close to the deification of Nature. In the second model, the modern one, the human intellect is raised to the highest place [1].

2. An alternative

We explore a third option, an 'interacting' model where the emphasis is on the relation, the inter-action which brings together into a community and a communion the different entities. We focus our attention to modern Science: the Special and General Theory of Relativity, Quantum Mechanics, Cosmology. We realize that a new paradigm emerges, where nature embodies relational principles. Furthermore the new paradigm converses with the old Sophia and gnosis of the Patristic Tradition.

In **Special Relativity**, Einstein pointed out that there is no absolute motion. Two observers moving with different speeds, they will deduce the same description of the natural phenomena, the same laws. Furthermore he required that the speed of light *c*, the speed of information transfer, is a universal constant. Notice the absolute is not space, the absolute is not time, but the rate of change, how fast the light crosses space in the unit of time. Thus we are led to a unified *space-time*.

The **General Theory of Relativity** provides even more radical changes. Gravity provides a curved space-time (it is not flat anymore). We may evaluate the curvature through the equations of General Relativity, and we find out there is no static solution. The Universe expands or contracts. In our case the Universe expands, something that started 13.7 billion years ago (the apparent age of the Universe). Following the cosmological evolution, in a friendly planet, our Earth, appeared the living organisms, some 4 billion years go. In the third stage of evolution, homo sapiens develops the language, as an instrument of communication, expression and domination. Therefore the **notion of evolution**,

evolution with multiple stages, is a key notion (maybe we are in the beginning of the fourth stage of evolution, the post-human evolution).

But the strong rift appears with the birth and development of **Quantum Mechanics**. Quantum Mechanics rejects Aristotle's classical logic, the dichotomy between A and its opposite $\overline{A}$ (where we have to choose between A or $\overline{A}$). In Quantum Mechanics we have the coexistence, the superposition of A and $\overline{A}$). Also the quantum particle is actually everywhere, it is not localized and the prime feature of Cartesian matter, 'res extensa', is destroyed. Heisenberg's uncertainty principle brings closer the observer and the observed, the subject and the object. They appear as an interrelated couple. In Mermin's terms "Correlations only have a meaning, the correlata, those that are correlated they don't. If A and B are correlated, what counts is the correlation, not A or B." [D. Mermin, *What is Quantum Mechanics Trying to Tell Us?*, quant-ph/9801057]

Our short journey through the achievements of the 20th century Science presents Nature as an immense and very dense web of relations. All dualisms are abolished (space-time, matter-energy, particle-wave, subject-object) and they are replaced by genuine triadic relationships. Cosmos appears as a continuous process of becoming. Evolution is the principle, the driving force and the result of a very complex dynamics [3]. Another important shift is the transfer of ontological interest from 'τι εστι' (what is it) to 'πως εστιν' (how is it). In other terms, the category of relation, or the functionality, takes prevalence over that of essence (ουσία)

3. The inherent dialogue (Peirce, Palamas, Wittgenstein)

Our findings strongly resonate with the ideas and notions developed by a great American thinker Charles Sanders Peirce [4]. Peirce is an ardent advocate of evolution. He defined also three different modes of evolution:

1. *anancastic* evolution, where the mechanical necessity reigns, the best example being Newtonian mechanics;
2. *tychastic* evolution, where chance predominates, Darwin's theory serving as an example;
3. *agapastic* evolution, where agape (αγάπη) is the source of creative growth and intelligible novelty.

Peirce considered that our knowledge is founded on our capability to employ and use signs. For Peirce "*a sign is something which stands to somebody (the interpretant) for something (the object) in some respect or capacity*" [5].

All of our scientific knowledge is a production of signs. Next to Nature, we build up a theory, a scientific language composed of signs, which refers to the events we observe in Nature. We gather that we experience an endless semeiotic process, and we live in an 'ocean of signs', to recall a phrase of Saint Efraim the Syrian.

One of the most important contributions of Peirce, was the creation of a **new logic**, where the notion of relation is the prime notion, the fundamental irreducible datum, and everything is expressed in terms of relations.

In the usual logic the subject is the starting point. For Peirce though the subject is defined through the relations he (she) entertains and emerges as the ensemble of all its relationships. The relations are composed. Given a relation $R_{jl,}$ connecting entity l to entity j, and a relation $R_{kj,}$ connecting entity j to entity k, this implies the existence of the relation $R_{kl,,}$ connecting entity l to entity k:

$$R_{kj} R_{jl} = R_{kl}$$

We have managed to show that the relational logic of Peirce leads to the fundamental quantum laws and also to string theory [6, 7]. Since string theory is the theory unifying all interactions, we suspect that Nature itself embodies mathematical structures implied by Relational Logic.

The new paradigm enters into discussion with the old Sophia and gnosis of the Patristic Tradition. According to Saint Maximos the human being should first unify all the sensible objects. Then moving beyond the sensible, he is entering the intelligible, and he unifies the different reasons into a single logos. At the end, in an act of love, the human being presents the unified Universe as an offer to God [8]. A fundamental aspect of Orthodox Theology is the distinction between Divine essence and Divine energies, advanced by Saint Gregory Palamas. This distinction allows the Creation to be a manifestation of the Divine energy and will, preserving at the same time the ontological gulf between Creation and God. This type of approach may provide the basis of a **new epistemology** [9], *within which knowledge is founded in the energies, the interactions, rather than being conceived as the pursuit of essence.*

4. Discovering Palamas

Let us review the essential points of the Palamas paradigm [9].

It is the ενέργεια, the relation, the interaction, which is revealing ουσία (essence). An essence without relations is non-existent (In Greek ουσία ανούσιος). Thus the whole Cosmos is connected via energies and appears as a web of relations.

Palamas knows in a profound way logic and especially Aristotle's logic. He gave a talk on Aristotle's logic at the age of 17, in front of the emperor Kantakouzinos, raising the admiration of the rector of the University of Constantinople, Metochitis. But he cannot accept that the whole of reality can be confined within the Aristotelian categories (συμβεβηκός: accident, γένος: genus, είδος: kind, species, όρος: term).

The contradiction is there, but we don't have to choose one of the two terms of the contradiction. We can go beyond the contradiction. I consider this approach, this attitude, as a forerunner of quantum logic.

The ενέργεια, the action of the cognitive process does not allow to distinguish four entities: 1) the observer (ορώντα), 2) the medium through we observe (το δι' ου), 3) the object we observe (εις ο), 4) what is this object (τι αυτό έστιν). We may feel free to compare this statement, coming from the 14th century, with the most recent proposals in cognition and semiotics of the 20th and the 21th century.

One of the places where we encounter ενέργεια, relation, action, is the language, where the word-logos tries to capture the real and offer a meaning. In this domain we find a strong correspondence between Gregory Palamas and L. Wittgenstein, a most farsighted scholar who studied language and the limits of language. I am confined to mention few statements of Wittgenstein [10].

1. Cosmos is the ensemble of events, not of objects;
2. the meaning of Cosmos does not exist within Cosmos, but outside it, and this meaning we may call it God;
3. Objects that are not expressed by words, they constitute a mystical element.

I think that indeed there is a common ground between Palamas and Witgenstein.

5. Instead of conclusions

We are used to a linear conception of time: we leave the past, we live the present, we anticipate and we turn to the future. History appears as a display of events, a quotation of milestones and chronological dates. Sometimes though, when we study a word, an idea, a suggestion, another history emerges. This history crosses the time, unravels hidden stratification, invites to unprecedented synthesis, puts forward a new topography, indicates similar points among different epochs, searches for the indivisible kairos-time [*Project ,Traditions and Modernity'*, http://tr-modern.physics.auth.gr/].

In our case we studied the triadic relation human-nature-metaphysics. The historical journey displayed three proposals. The ancient Greek proposal, where nature is the source of logos and harmony. Our duty is to reveal this hidden logos and reach the divine nature. The second proposal, originated within modernity, stresses the importance of the human intellect. The subject is defined through its cognitive action (cogito) and dominates over nature. Nature itself is devoid of meaning and significance. The surprise emerged from the science of the 20th century (Quantum Mechanics, Relativity). Within this third proposal the dichotomies disappear and they are replaced by ternary relations. The whole universe is found in a permanent evolution [8].

There is a profound insight offered by Theology and Philosophy. Gregory Palamas (14th century), in order to safeguard the presence of God within Cosmos, addressed the issue of divine energies. The notion of energy, provided to all subjects and objects, may lead us to a new epistemology [9]. The foundational concept is the energy-relation-interaction, not the individual subject. It is amazing that the theology of 14th century encounters the philosophy of the 20th century. C.S. Peirce, a most original mind, introduced in an elegant way relational logic, based on the concept of relation. Also an ardent advocate of evolution, he formulated a cosmological model, foreshadowing the developments in modern cosmology [4]. L. Wittgenstein in a profound study of language indicated its achievements and its limits. He pointed out that the belief in a meaning within Cosmos is identical to the belief in God. Furthermore questions like '*what is it?*' lead us to confusion, invoking the existence of a

hidden essence, or a general term [10]. Again we attest the affinity of ideas shared by Palamas and Wittgenstein.

We crossed time and made appeal to different disciplines (Science, Philosophy, Theology) in order to study the relation bringing together anthropos, Science, Metaphysics. It seems what is actually more important is the emergence of 'relational modes of existence'. Is this the ultimate truth? We all wish to reach the ultimate truth, and there are people who believe that they are the holders of the ultimate truth. Gregory Palamas offers us an analogy about the search of truth

"We run after the smell, the scent of the essence, without having the essence within our hands." [9]

I think we should carefully follow the advice of Saint Gregory Palamas.

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