



MQ90

DUALISMO, ENTANGLEMENT, OLISMO UN DIBATTITO ANCORA APERTO

GIORNATE DI STUDIO IN OCCASIONE
DEL 90-ESIMO ANNIVERSARIO
DELLA FORMULAZIONE
DELLA MECCANICA QUANTISTICA

a cura di

Isabella Tassani



MQ90

Isonomia *Epistemologica*

Isonomia – Epistemologica

Volume XI

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A Unified Vision of Everything

Marco Giammarchi

Istituto Nazionale di Fisica Nucleare – Sezione di Milano (Italy)
marco.giammarchi@mi.infn.it

Luca Guzzardi

Dipartimento di Filosofia dell'Università degli Studi di Milano (Italy)
luca.guzzardi@unimi.it

Abstract: The case is presented for a unified version of human knowledge and the overall Unity of Everything. Three main sources of knowledge are considered to this goal: Western Philosophy, Modern Science (mostly, Quantum Mechanics) and Oriental Philosophy.

Keywords: Oriental Philosophy. Quantum Mechanics. Unity of Everything.

“Ich bin ein Teil des Teils, der anfangs
alles war, ein Teil der Finsternis, die sich
das Licht gebar.”

J.W. Goethe, *Faust*

1. Introduction

We will discuss a unified vision of Everything by performing three main steps. We start first, as a preliminary, by considering the path made by Western Philosophy, and in particular the concept of becoming. We will argue that going beyond this concept will open the possibility of a

Marco Giammarchi, Luca Guzzardi, “A Unified Vision of Everything”, in Isabella Tassani, *MQ 90 - Dualismo, entanglement, olismo. Un dibattito ancora aperto. Giornate di studio in occasione del 90-esimo anniversario della formulazione della meccanica quantistica*, pp. 51-58.

© 2021 Isonomia, Rivista online di Filosofia – Epistemologica – ISSN 2037-4348
Università degli Studi di Urbino Carlo Bo
<http://isonomia.uniurb.it/epistemologica>

Weltanschauung of the whole that includes ourselves as a Unity. To this goal, we use a reductionist version of Modern Science (based on Quantum Mechanics and General Relativity) and the general unifying view of Oriental Philosophy. We make the case for this to be an emergent possible theory of Everything.

2. Western Philosophy

The case is made starting from the development of Western Philosophy as presented by E. Severino in his 1996 book, *La filosofia dai Greci al nostro tempo*. His view follows the general idea that Philosophy was developed in the Greek and Western civilization as a response (a *remedy*) to the anguish generated by the Greek sense of becoming. Metaphysical systems have been built accordingly and in some cases harmonized (in more or less successful ways) with (western) Theology. Starting from Descartes a criticism has been put forward (about the identity of certainty and truth) that has led to approaches in the Idealistic direction, also to be the target of contemporary philosophical criticism.

Moving beyond the (Greek) concept of becoming that has characterized most of the Western approach is nowadays suggested¹ as a possible progress, and on this suggestion we set the first brick of the following construction, using Science and Oriental Philosophy. In the essence, we propose that this concept be revisited and re-connected to the idea of Being, so that there is a fundamental Unity of Everything. In our view, this should be thought as encompassing Becoming and Being, thus Being and Non-being, the One and the Many, True and Untrue.

This viewpoint sets the stage for further progress, as it opens the possibility of a deep Unification of Everything, similar to the epistemological drive behind Science. We regard Modern Science as a “hyposthesis” of western-styled tradition of knowledge as suggested in Severino (1996). With this term, however, we do not mean a hypostatization of certain traits and trends of western philosophy, nor a hierarchy of a multiplicity of “essences” into which the “one” philosophical tradition becomes reified in the course of its development. We use hyposthesis more or less in the same sense in which, beginning with the 4th centuries AD, Trinitarian theologians used it to describe the relationship between the very essence (*ousia*) of God and the Persons of Trinity (*hypostases*) — that is, as distinct manners of existing of a whole. Now, Modern Science sets a

¹ Severino (1996).

defendable claim to be a fundamental one by its characteristics of exploring the deepest levels of space and time – the categories around which we organize the sensible experience. Our next step will be therefore to explore what the most fundamental levels of Science (Quantum Mechanics and General Relativity) are telling us.

3. Quantum Field Theory: two fundamental lessons

We take here two important lessons from modern Science – mostly from Quantum Field Theory (QFT, the relativistic version of Quantum Mechanics). These basic ideas have to do with the Unification of Fundamental Forces and the criticism (at the quantum level) of the Subject-Object separation.

3.1 First lesson: the Unification of Fields

Contrary to general belief, the idea of Unification of Forces (and of a Unified Field) is relatively old. Unifications have been attempted or even taken place several times in Physics. In the *Preface* to the *Principia*, dated “8 May 1686”, Newton clearly expressed the wish to unify all natural phenomena as effects of central forces: «If only we could derive the other phenomena of nature from mechanical principles by the same kind of reasoning!» Unfortunately, the generations of newtonianizing, quantifying physicists that followed, during the 18th century, dealt with, and measured, an increasing number of force-carrying “imponderable fluids” like aether, phlogiston, caloric, the agents of electricity and those of magnetism. But efforts to unify forces into more basic “active principles” (following the *Queries* of Newton’s *Opticks*) did not cease as well, and also involved experimental research. In 1821, Oersted’s experiment showed that magnetic interactions are not independent from electricity; the 1851 Faraday experience of the rotation of polarization of the magnetic field (in an optically active medium) indicated that optics had much in common with electric and magnetic effects and could be possibly seen as a manifestation of a unified “field” — a term that Faraday introduced in 1845 but that was formalized only a decade or so later, by Maxwell. His equations for electromagnetism (1861) were the first monumental example of Unification of Fields. Moreover, both Faraday and Maxwell envisioned the possibility to treat gravitation — at that time viewed in plain Newtonian terms, as an

action at a distance capable of instantaneously passing through space — as a field in its own right, namely a “gravitational field” in their own words.

As well known, after the development of Special and General Relativity on the one hand, and of quantum physics on the other, such ambitious programs of unification have been gradually abandoned for a number of reasons — which is of course not our aim to explore or even to list. At the same time, the concept of a unified theory has acquired a more technical and limited meaning, turning into a series of attempts to unify particular fields within the environment of the Quantum Field Theory (QFT). The last spectacular example of Unification of Fields took place between 1973 and 1984 when Weak Nuclear and Electromagnetic forces became unified into the single Quantum Field of the Electroweak Interactions.

Nowadays the fundamental quantum fields are considered to be the Nuclear Strong and Electroweak; on the other hand, Quantum Field Theory has become the modern name for the most advanced (special-relativistic invariant) view of fundamental reality. It is a theory of quantum fields filling spacetime that has been derived by the harmonization of Quantum Mechanics and Special Relativity, a process started in 1928 with the famous Dirac Equation. This indicates both our path toward a wider unification and the present limit of physical theory. Nuclear Strong and Electroweak symmetries are special symmetries of QFT and live in a classical (i.e. non-quantized) spacetime in which Gravitation is described by a curvature, in agreement with the ideas of General Relativity. This unification of fields, however, is obviously not complete: we are dealing with two independent quantum fields living in a (pseudo)Riemannian manifold that embeds Gravitation (the non-quantum field) by means of curvature. Completing this path – in the sense of further unification – would require:

- I. The Unification of the Electroweak and Strong Nuclear Fields in a unique QFT to reach the so called Grand Unification Theory (GUT). The energy at which this can possibly take place is called the GUT energy scale².
- II. After step I, one would need the Unification of the GUT field with Gravity. This can possibly take place at an energy which is called the Planck energy. Or the Quantum Gravity scale³, where the structure of spacetime itself shows quantum properties.

² The GUT scale has an energy of about 10^{16} GeV.

³ The Planck energy is about 10^{19} GeV.

We are still far away from completing this program. Yet, the indication of Unification is *not only* there, present and alive in our efforts. We rather suggest that this indication has *always* been there as a result of our will to unify.

It is necessary at this point to remark on a caveat here: this is admittedly a reductionist approach. Science as a whole is taken to be (potentially derivable from) Quantum Field Theory and General Relativity. This is our ansatz here, which is of course arbitrary and could be criticized. As a matter of fact, a strictly reductionist paradigm has been confirmed only for a very limited set of (physical) systems. However, we only treat it as a powerful working tool — the Wittgenstein’s ladder that we use in order to reach a higher and wider viewpoint; that, however, can be thrown away after one has climbed up it.

3.2 Second lesson: the removal of subject-object separation

There are many speculations around the so-called “Interpretation of Quantum Mechanics”. It is our viewpoint that most of these speculations come from the systematic and perhaps unnatural separation between Physics and Philosophy. This separation has the effect of making us blind to the epistemological assumption which is usually made in Science: that an objective reality “exists” independent from the observer, a strictly realistic point of view⁴.

As much as this assumption can appear naïve to a Philosopher, it is still the “common sense” ansatz that is made by most of the people. And notably, most of the physicists. Stated explicitly even at the beginning of the famous EPR (Einstein-Podolsky-Rosen) 1935 paper, this constitutes – in our view – the source of many of the speculations about possible different interpretations of Quantum Mechanics. Without entering into this complex subject, we only claim that Quantum Mechanics disagrees with the so-called realistic paradigm of a reality independent from the observer. For us, reality encompasses *every* observer’s view (as a consequence, every observer can have a Theory of Everything potentially different from any other observer, even if this does not exclude that translations from one theory to another are possible).

This is discussed in Giammarchi (2015) and (in more detail) in Baggott (2004). In short, the series of considerations that lead to the Bell inequality

⁴ Incidentally, the point of view of Einstein, in the course of the famous Einstein-Bohr debate.

and its violations (first detected in the Aspect experiment) are now fully substantiated by a wealth of experimental information and entire research fields, such as Quantum Information or Quantum Optics, are based on these concepts. It seems to me therefore inescapable to draw the important epistemologic consequences of Quantum Mechanics: this powerful theory⁵ is in stark contrast with the traditional subject-object separation.

4. Oriental Philosophy

Most of the Oriental Philosophy is a *Weltanschauung* of Unity, where the subject-object separation is relegated to the role of an illusion, the famous “veil of Maya”, hiding the deeper levels of reality. There is therefore a clear parallel between this approach and the Unification of Forces that we have outlined above. This holds both for the doctrinal level (of many Oriental teachings) and for a huge variety of mystical or unification experiences, such as Transcendental Meditation as well as many others.

A key point in this direction is the concept of Vedic Sacrifice (*yajña*), a kind of worship usually in the form of offering oblations to the gods in front of a sacred fire, often with *mantras*. According to the Śruti and the Smṛti (the complex of texts comprising the canon of Hinduism), the system of *yajña* was given by God at the beginning of the world to human beings and deities like Indra, Agni, Varuna, etc., as a link between them. The human beings were to satiate the gods through the sacrifices and the gods in return would bestow on the human beings rains, food and other things needed for their prosperity. As a consequence, the ritual of *yajña* can be conceived as a powerful mechanism to relate the realm of mankind and the one of deities, and can be (re)interpreted in two principal ways. Following Calasso (2010), one might start from the idea that Vedic Sacrifice is the reparation from the breaking of a (supposedly) “natural order”. In the essence, man has broken a fundamental order, by becoming (by means of prothesis and the fire) the predator of every other living being. We must remark, however, that this idea has the usual problem of defining what a “natural order” is; mankind by definition making part of it renders this a circular kind of reasoning as one might speculate that it was “natural” for mankind to take over this planet.

We therefore suggest a deeper and richer view of Vedic Sacrifice, which can also be hinted at from Calasso (2010). Vedic Sacrifice as the mean to repair the main fracture: the fracture that created Multiplicity from

⁵ Predictions from Quantum Mechanics (and QFT) have reached an impressive accuracy and have been confirmed in thousands of different ways and experiments.

Oneness. The separation of Being and Becoming. It is this view of Vedic Sacrifice that has the deepest consequences, as the Universal Cosmogony and subsequent evolution basically consists of a story of separation among all things that were originally One.

In an analogous way, high-energy physics describes what (likely) happened to the very early Universe – as this was undifferentiated matter-energy in a superdense, supersymmetric state. Then a process of separation took place, every symmetry gone lost and things became separated. Human beings, a sliver of this original separation process, have finally give birth to physics, another sliver of separation, that represents their sacrifice — their struggle to recover the One.

5. Conclusion

Modern Physics and Oriental Philosophy speak different languages which bring, following different lines of development, to similar consequences. the research for a Unified Field of modern science is the research of unity. The struggle to recover unity guides the Vedic ritual of Sacrifice. In turn, unity in the sense of GTU is obtained at high energies when (at the beginning of the Universe) the full symmetry was in place. And this powerfully reminds the creation of the Universe and the RigVeda Unity that can possibly be experienced through meditational practice.

With this, we obviously do not mean that modern physics and oriental philosophy have the same content (that is notoriously the view expressed by Capra in *The Tao of Physics*); rather they are two different ways that human beings have developed in order to react to a shared need: the struggle toward the One, that also justifies the Many.

In this sense, modern science is pointing to the direction of the fundamental truths expressed by the ancient Oriental tradition.

References

Baggott, J., 2004, *Beyond Measure: Modern Physics, Philosophy and the Meaning of Quantum Theory*, Oxford, Oxford University Press.

Calasso, R., 2010, *L'Ardore*, Milano, Adelphi.

Giammarchi, M., 2015, «Elementary philosophical and theological consequences of Quantum Mechanics», *European Journal of Science and Theology*, 11, p. 155.

Peskin, M., Schroeder, E., 2016, *An Introduction to Quantum Field Theory*, Boulder, Westview Press.

Severino, E., 1996, *La filosofia dai Greci al nostro tempo*, Milano, Biblioteca Universale Rizzoli.