

TRANSDISCIPLINARITY: THE HIDDEN THIRD, BETWEEN THE SUBJECT AND THE OBJECT

1. Introduction

The relation between the Subject and the Object is a crucial problem of philosophy.

This relation varied in the different periods of human culture. In the pre-modern world, the Subject was immersed in the Object. In the modern world, the Object and the Subject were supposed to be totally separated, while in our post-modern era the Subject becomes predominant as compared with the Object (see figures).

Of course, the key point in understanding the Object-Subject relation is the vision on Reality that humans shared in different periods of the historical time.

“When the layman says 'reality', he thinks that this is something obvious. But, for me, the formulation of a new idea of reality is the most important and the hardest task of our times” – wrote Wolfgang Pauli, Nobel Prize of Physics, more than 60 years ago¹. The prophetic words of Pauli are still valid today.

Dictionaries tell us that "reality" means²: 1. the state or quality of being real; 2. resemblance to what is real; 3. a real thing or fact; 4. something that constitutes a real or actual thing, as distinguished from something that is merely apparent. These are clearly not definitions but descriptions in a vicious circle: "reality" is defined in terms of what is "real".

In order to avoid any ambiguity, I will define "reality" in a sense which is used by scientists, namely in terms of "resistance"³.

By “reality” we intend first of all to designate that which *resists* our experiences, representations, descriptions, images, or even mathematical formulations. It puts the accent on a relational view of what "reality" could mean.

In so far as reality participates in the being of the world, one has to assign also an ontological dimension to this concept. Reality is not merely a social construction, the consensus of a collectivity, or some inter-subjective agreement. It also has a trans-subjective dimension: for example, experimental data can ruin the most beautiful scientific theory.

¹ Pauli, 1948.

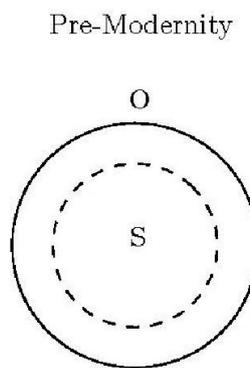
² <http://dictionary.reference.com/browse/reality>

³ Nicolescu, 1985, 2000.

The meaning we give to the word “Reality” is therefore pragmatic and ontological at the same time. I will consequently denote by a capital letter this word.

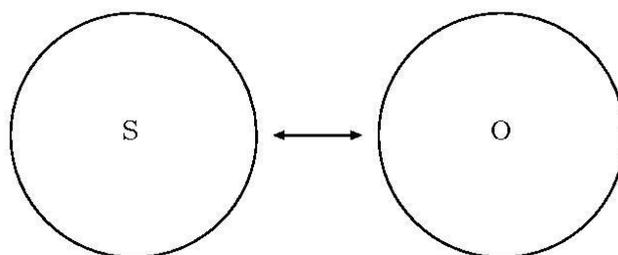
We have to distinguish, in order to avoid further ambiguities, the words “Real” and “Reality”. *Real* designates that which *is*, while *Reality* is connected to resistance in our human experience. The “Real” is, by definition, veiled for ever (it does not tolerate any further qualifications) while “Reality” is accessible to our knowledge. Real involves non-resistance while Reality involves resistance.

I will now describe some historical aspects concerning the transdisciplinary concept of "level of Reality".



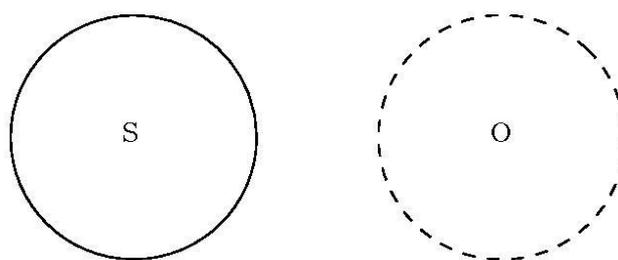
S = subject, O = object

Modernity



S = subject, O = object

Post-Modernity



S = subject, O = object

2. Levels of Reality - Historical aspects: John of the Ladder (c. 525–606), Nicolai Hartmann (1882-1950) and Werner Heisenberg (1901-1976)

The idea of "levels of Reality" is not, in fact, completely new. The human being felt, from the beginnings of its existence, that there are at least two realms of reality - one visible, the other invisible.

In a more elaborate way, the theological literature expressed the idea of a "scale of being", which corresponds, of course, to a scale of Reality. The scale of Jacob (Genesis 28:10-12) is one famous example, so nicely illustrated in the Christian Orthodox iconography. There are several variants of the scale of being. The most famous one is found in the book *Climax* or *Ladder of Divine Ascent* of Saint John Climacus (c. 525–606). The author, also known as John of the Ladder, was a monk at the monastery on Mount Sinai. There are thirty steps of the ladder, describing the process of *theosis*. Resistance and non-resistance is nicely illustrated in the scale of John of the Ladder: the human being climbs the steps, which denote the effort of the human being to evolve from spiritual point of view through the resistance to his or her habits and thoughts, but the angels, these messengers of God, helps him or her to jump through the intervals of non-resistance between the steps of the ladder.

In the second part of the 20th century, two important thinkers on the problem of levels of Reality are Nicolai Hartmann and Werner Heisenberg.

Nicolai Hartmann (1882-1950) is a somewhat forgotten philosopher, who had Hans-Georg Gadamer as student and Martin Heidegger as his successor at the University of Marburg, in Germany. He elaborated an ontology based on the theory of categories. He distinguishes four levels of Reality⁴: inorganic, organic, emotional and intellectual. In 1940 he postulated four laws of the levels of Reality: the law of recurrence, the law of modification, the law of the *novum* and the law of distance between levels⁵. The last law, postulating that the different levels do not develop continuously, but in leaps, is particularly interesting in the context of our discussion.

Almost simultaneously with Hartmann, in 1942, the Nobel Prize of Physics Werner Heisenberg elaborated a very important model of levels of reality in his *Manuscript of 1942*⁶, which was published only in 1984.

The philosophical thinking of Heisenberg is structured by "two directory principles: the first one is that of the division in levels of Reality, corresponding to different objectivity

⁴ Poli, 2001 and 2007.

⁵ Hartmann, 1940.

⁶ Heisenberg, 1998.

modes depending on the incidence of the knowledge process, and the second one is that of the progressive erasure of the role played by the ordinary concepts of space and time.” [p. 240]

For Heisenberg, reality is “the continuous fluctuation of the experience as gathered by the conscience. In this respect, it is never wholly identifiable to an isolated system“[p. 166]. Reality could not be reduced to substance. For the physicists of today this fact is obvious: the matter is the *complexus* substance-energy-space-time-information.

As written by Catherine Chevalley, who wrote the Introduction to the French translation of Heisenberg's book, “the semantic field of the word reality included for him everything given to us by the experience taken in its largest meaning, from the experience of the world to that of the souls modifications or of the autonomous signification of the symbols.” [p. 145]

Heisenberg states ceaselessly, in agreement with Husserl, Heidegger, Gadamer and Cassirer (whom he knew personally), that one has to suppress any rigid distinction between Subject and Object. He also states that one has to end with the privileged reference on the outer material world and that the only approaching manner for the sense of reality is to accept its division in regions and levels.

Heisenberg distinguishes “regions of reality” (*der Bereich der Wirklichkeit*) and “levels of reality” (*die Schicht der Wirklichkeit*).

“We understand by “regions of reality” – writes Heisenberg – [...] an ensemble of nomological connections. These regions are generated by groups of relations. They overlap, adjust, cross, always respecting the principle of non-contradiction.” The regions of reality are, in fact, strictly equivalent to the levels of organization of the systemic thinking.

Heisenberg is conscious that the simple consideration of the existence of regions of reality is not satisfactory because they will put on the same plane classical and quantum mechanics. It is for this essential reason that he was regrouping these reality regions into different levels of Reality.

Heisenberg regroupes the numerous regions of reality in three distinct levels.

“It is clear - wrote Heisenberg – that the ordering of the regions has to substitute the gross division of world into a subjective reality and an objective one and to stretch itself between these poles of subject and object in such a manner that at its inferior limit are the regions where we can completely objectify. In continuation, one has to join regions where the states of things could not be completely separated from the knowledge process during which we are identifying them. Finally, on the top, have to be the levels of Reality where the states of things are created only in connexion with the knowledge process.“ [p. 372]

The first level of Reality, in the Heisenberg model, corresponds to the states of things, which are objectified independently of the knowledge process. He situates at this first level classical mechanics, electromagnetism and the two relativity theories of Einstein, in other words classical physics.

The second level of Reality corresponds to the states of things inseparable from the knowledge process. He situates here quantum mechanics, biology and the consciousness sciences.

Finally, the third level of Reality corresponds to the states of things created in connexion with the knowledge process. He situates on this level of Reality philosophy, art, politics, 'God' metaphors, religious experience and inspiration experience.

One has to note that the religious experience and the inspiration experience are difficult to assimilate to a level of Reality. They rather correspond to the passage between different levels of Reality in the non-resistance zone.

We have to underline, in this context, that Heisenberg proves a high respect for religion. In relation with the problem of God's existence, he wrote: "This belief is not at all an illusion, but is only the conscious acceptance of a tension never realised in reality, tension which is objective and which advances in an independent way of the humans, that we are, and which is yet at its turn nothing but the content of our soul, transformed by our soul." [p. 235] The expression used by Heisenberg "a tension never realised in reality" is particularly significant in the context of our discussion. It evokes what we called "Real" as distinct from "Reality".

For Heisenberg, world and God are indissolubly linked: "this opening to the world which is at the same time the 'world of God', finally also remains the highest happiness that the world could offer us: the conscience of being home." [p. 387] He remarks that the Middle Age made the choice of religion and the 17th century made the choice of science, but today any choice or criteria for values vanished.

Heisenberg also insists on the role of intuition: "Only the intuitive thinking – wrote Heisenberg – can pass over the abyss that exists between the concepts system already known and the new concepts system; the formal deduction is helpless on throwing a bridge over this abyss." [p. 261] But Heisenberg doesn't draw the logical conclusion that is imposed by the helplessness of the formal thinking: only the non-resistance of our experiences, representations, descriptions, images or mathematical formalisations could bring a bridge over the abyss between two zones of resistance. The non-resistance is, in fact, the key of understanding the discontinuity between two immediately neighbour levels of Reality.

Now, I will describe the relation between Object and Subject in the transdisciplinary approach.

3. Towards a Unified Theory of Levels of Reality - The Transdisciplinary Approach

Transdisciplinarity is founded upon three axioms⁷:

i. **The ontological axiom:** *There are different levels of Reality of the Object and, correspondingly, different levels of Reality of the Subject.*

ii. **The logical axiom:** *The passage from one level of Reality to another is insured by the logic of the included middle.*

iii. **The epistemological axiom:** *The structure of the totality of levels of Reality appears, in our knowledge of nature, of society and of ourselves, as a complex structure: every level is what it is because all the levels exist at the same time.*

The key concept of the transdisciplinarity is the concept of *levels of Reality*, which I introduced in 1982⁸, independently of Heisenberg.

By “level of Reality”, we designate a set of systems which are invariant under certain general laws: for example, quantum entities are subordinate to quantum laws, which depart radically from the laws of the macrophysical world. That is to say that two levels of Reality are different if, while passing from one to the other, there is a break in the applicable laws and a break in fundamental concepts (like, for example, causality). Therefore there is a *discontinuity* in the structure of levels of Reality. Every level of Reality is associated with its own space-time.

The introduction of the levels of Reality induces a multidimensional and multi-referential structure of Reality. Both the notions of the ‘Real’ and ‘levels of Reality’ relate to what is considered to be the ‘natural’ and the ‘social’ and is therefore applicable to the study of nature and society⁹.

Every level is characterized by its *incompleteness*: the laws governing this level are just a part of the totality of laws governing all levels. And even the totality of laws does not exhaust the entirety of Reality: we have also to consider the Subject and its interaction with the Object. *Knowledge is forever open.*

⁷ Nicolescu, 1996.

⁸ Nicolescu, 1982.

⁹ Nicolescu (Ed), 2008.

The zone between two different levels and beyond all levels is a zone of *non-resistance* to our experiences, representations, descriptions, images, and mathematical formulations. Quite simply, the transparency of this zone is due to the limitations of our bodies and of our sense organs, limitations which apply regardless of what measuring tools – internal or external - are used to extend these sense organs. We therefore have to conclude that the topological distance between levels is finite. However this finite distance does not mean a finite knowledge. Take, as an image, a segment of a straight line – it contains an infinite number of points. In a similar manner, a finite topological distance could contain an infinite number of levels of Reality.

The unity of levels of Reality of the Object and its complementary zone of non-resistance constitutes what we call *the transdisciplinary Object*.

Inspired by the phenomenology of Edmund Husserl¹⁰, we assert that the different levels of Reality of the Object are accessible to our knowledge thanks to the different levels of perception which are potentially present in our being. These levels of perception permit an increasingly general, unifying, encompassing vision of Reality, without ever entirely exhausting it. In a rigorous way, these levels of perception are, in fact, *levels of Reality of the Subject*.

As in the case of levels of Reality of the Object, the coherence of levels of Reality of the Subject presupposes a zone of non-resistance to perception.

The unity of levels of levels of Reality of the Subject and this complementary zone of non-resistance constitutes what we call the *transdisciplinary Subject*.

The two zones of non-resistance of transdisciplinary Object and Subject must be identical for the transdisciplinary Subject to communicate with the transdisciplinary Object. A flow of consciousness that coherently cuts across different levels of Reality of the Subject

¹⁰ Husserl, 1966.

must correspond to the flow of information coherently cutting across different levels of Reality of the Object. The two flows are interrelated because they share the same zone of non-resistance.

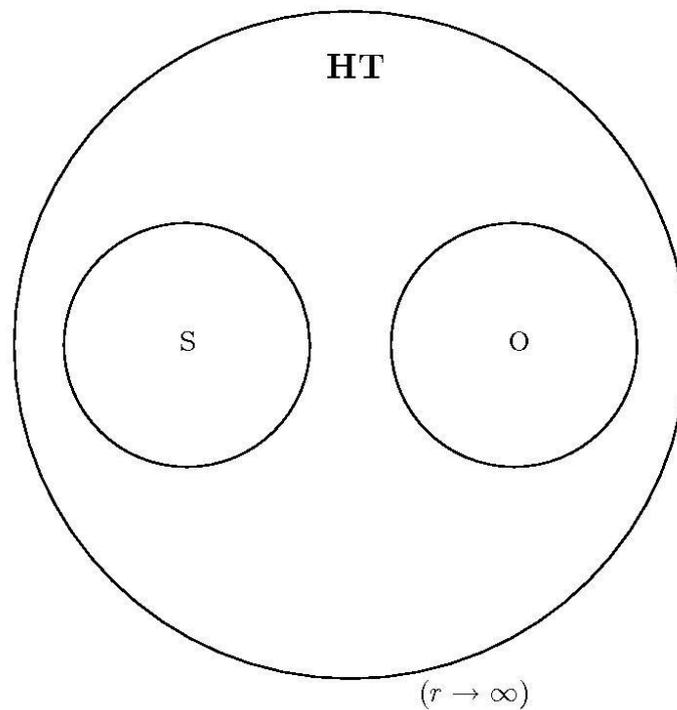
Knowledge is neither exterior nor interior: it is simultaneously exterior and interior. The studies of the universe and of the human being sustain one another.

The zone of non-resistance plays the role of a *third* between the Subject and the Object, an Interaction term which allows the unification of the transdisciplinary Subject and the transdisciplinary Object while preserving their difference. In the following we will call this Interaction term the *Hidden Third*.

Our ternary partition { Subject, Object, Hidden Third } is, of course, different from the binary partition { Subject vs. Object } of classical, modern metaphysics.

Transdisciplinarity leads to a new understanding of the relation between Subject and Object, which is illustrated in the following figure:

Transdisciplinarity



S = subject, O = object, HT = Hidden Third

In the transdisciplinary approach, the Subject and the Object are immersed in the Hidden Third.

The transdisciplinary Object and its levels, the transdisciplinary Subject and its levels and the Hidden Third define the transdisciplinary Reality or *trans-Reality* (see Fig. 1).

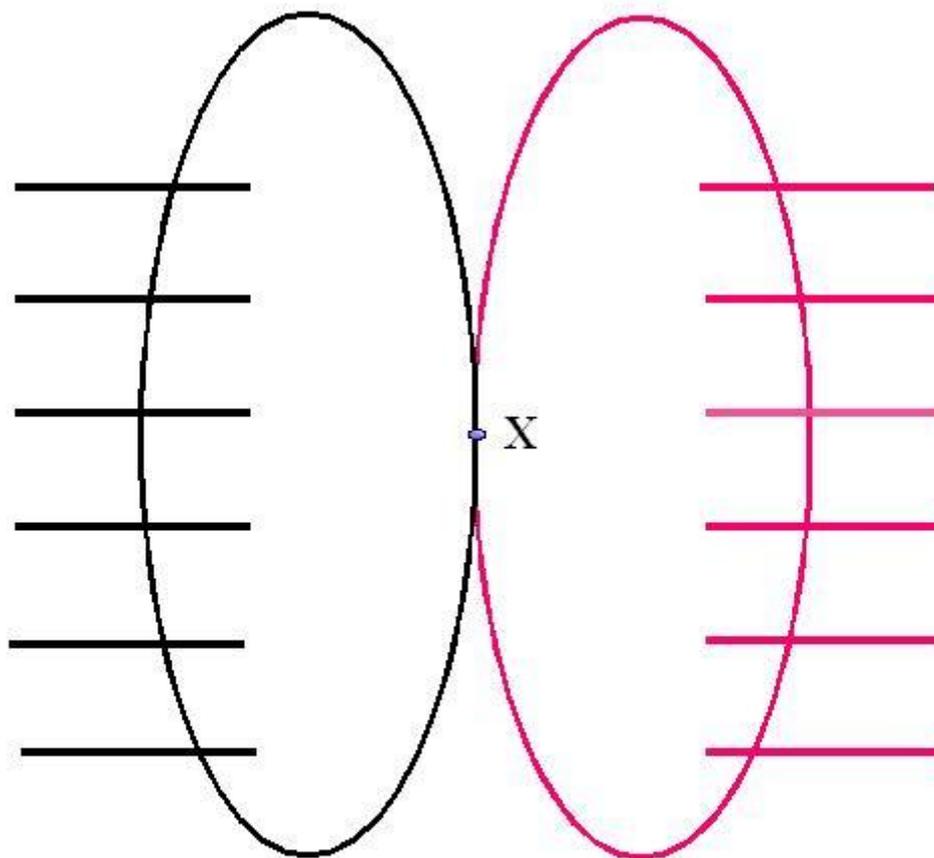


Fig. 1 : Transdisciplinary Reality

The incompleteness of the general laws governing a given level of Reality signifies that, at a given moment of time, one necessarily discovers contradictions in the theory describing the respective level: one has to assert A and non-A at the same time.

It is the included middle logic¹¹ which allows us to jump from one level of Reality to another level of Reality.

Our understanding of the axiom of the included middle — there exists a third term T which is at the same time A and non-A — is completely clarified once the notion of “levels of Reality” is introduced.

In order to obtain a clear image of the meaning of the included middle, let us represent the three terms of the new logic — A, non-A, and T — and the dynamics associated with them by a triangle in which one of the vertices is situated at one level of Reality and the two other vertices at another level of Reality (see Fig. 2). The included middle is in fact an

¹¹ Lupasco, 1951; Badescu and Nicolescu (ed.), 1999; Brenner, 2008.

included third. If one remains at a single level of Reality, all manifestation appears as a struggle between two contradictory elements. The third dynamic, that of the T-state, is exercised at another level of Reality, where that which appears to be disunited is in fact united, and that which appears contradictory is perceived as non-contradictory. In other words, the action of the logic of the included middle on the different levels of Reality is able to explore the open structure of the unity of levels of Reality.

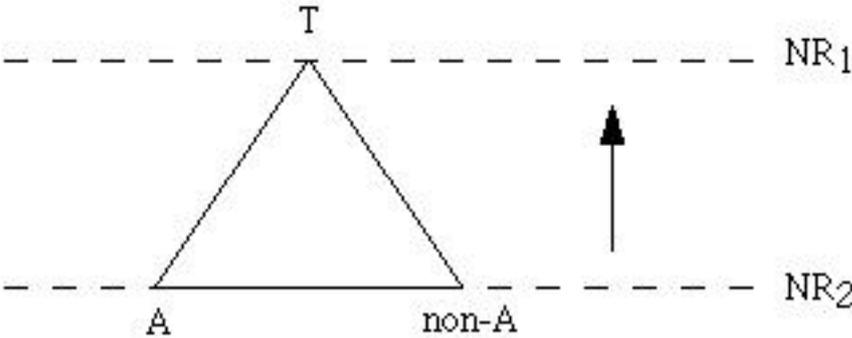


Fig. 2 : Symbolic representation of the action of the included middle logic.

All levels of Reality are interconnected through complexity. From a transdisciplinary point of view, complexity is a modern form of the very ancient principle of universal interdependence. The principle of universal interdependence entails the maximum possible simplicity that the human mind could imagine, the simplicity of the interaction of all levels of reality. This simplicity can not be captured by mathematical language, but only by symbolic language.

The transdisciplinary theory of levels of Reality appears as conciliating reductionism and non-reductionism¹². It is, in some aspects, a multi-reductionist theory, *via* the existence of multiple, discontinuous levels of Reality. However, it is also a non-reductionist theory, *via* the Hidden Third, which restores the continuous

¹² Nicolescu (Ed.), 2008.

interconnectedness of Reality. The reductionism/non-reductionism opposition is, in fact, a result of binary thinking, based upon the excluded middle logic. The transdisciplinary theory of levels of Reality allows us to define, in such a way, a new view on Reality, which can be called *trans-reductionism*.

The transdisciplinary notion of levels of Reality is incompatible with reduction of the spiritual level to the psychological level, of the psychological level to the biological level, and of the biological level to the physical level. Still these four levels are united through the Hidden Third. However, this unification can not be described by a scientific theory. By definition, science excludes non-resistance. Science, as is defined today, is limited by its own methodology.

The transdisciplinary notion of levels of Reality leads also to a new vision of Personhood, based upon the inclusion of the Hidden Third. The unification of the Subject is performed by the action of the Hidden Third, which transforms knowledge in *understanding*. "Understanding" means fusion of knowledge and being.

In the transdisciplinary approach, the Hidden Third appears as the source of knowledge but, in its turn, needs the Subject in order to know the world: the Subject, the Object and the Hidden Third are inter-related. This view is perfectly compatible with the incarnational approach developed by Christopher C. Knight in his book *The God of Nature – Incarnation and Contemporary Science*¹³.

The human person appears as an interface between the Hidden Third and the world. The erasing of the Hidden Third in knowledge signifies a one-dimensional human being, reduced to its cells, neurons, quarks and elementary particles.

4. Concluding remarks

¹³ Knight, 2007.

It is obvious that a huge work remains to be performed in order to formulate a unified theory of levels of Reality, valid in all fields of knowledge, which involve, at the beginning of the 21st century, more than 8,000 academic disciplines, every discipline claiming its own truths and having its laws, norms and terminology.

I believe that the transdisciplinary theory of levels of Reality is a good starting point in erasing the fragmentation of knowledge, and therefore the fragmentation of the human being. We badly need a transdisciplinary hermeneutics¹⁴. This is a really big question.

In this context, the dialogue of transdisciplinarity with the patristic thinking, and in particular with the apophatic thinking, will be, of course, very useful. The Hidden Third is a basic apophatic feature of the future unified knowledge¹⁵.

I have very much hope for the potential contribution to a unified theory of levels of reality of a new branch of knowledge - biosemiotics, as exposed for example, in the stimulating book *Signs of Meaning in the Universe* of Jesper Hoffmeyer¹⁶. Biosemiotics is transdisciplinary by its very nature¹⁷. We live in *semiosphere*, as much we live in atmosphere, hydrosphere and biosphere. The human being is the unique being in the universe able to conceive an infinite wealth of possible worlds. These "possible worlds" are certainly corresponding to different levels of Reality. Powerful concepts elaborated by biosemioticians, like *semiotic freedom*, could lead us to understand what "personhood" could mean. "The human being is the most perfect sign", says Peirce.

Biosemiotics is based upon the philosophy of Charles Sanders Peirce (1839-1914), a great philosopher, logician, mathematician of the beginning of the 20th century¹⁸. For Peirce, Reality has a ternary structure. All our ideas about Reality belong to three classes: Firstness, Secondness and Thirdness. These classes have trans-categorial properties, through the way in which Peirce defines what Firstness is. There is a powerful theorem in graph theory established by Peirce, stating that each polyad superior to a triad can be analyzed in terms of triads, but triads could not be analyzed in terms of dyads. This leads him to think about three modes of being, manifestations of three universes of experience. The correspondence of Peirce's ternary dynamics with the transdisciplinary ternary dynamics of Reality {Subject, Object, Hidden Third} is striking and has to be further explored.

¹⁴ van Breda, 2007.

¹⁵ Nicolescu, 2006.

¹⁶ Hoffmeyer, 1996.

¹⁷ Witzany (Ed), 2007.

¹⁸ See, e. g., Hartshorne (Ed), 1931-1958 and Peirce, 1966.

"What is Reality?" - asks Peirce¹⁹. He tells us that maybe there is nothing at all which corresponds to Reality. It may be just a working assumption in our desperate tentative in knowing. But if there is a Reality - tells us Peirce - it has to consist in the fact that *the world lives, moves and has in itself a logic of events, which corresponds to our reason*. Peirce's view on Reality totally corresponds to the transdisciplinary view on Reality.

Let me finally note that a unified theory of levels of Reality is crucial in building sustainable development and sustainable futures. The considerations made till now in these matters are based upon reductionist and binary thinking: everything is reduced to society, economy and environment. The individual level of Reality, the spiritual level of Reality and the cosmic level of Reality are completely ignored. Sustainable futures, so necessary for our survival, can only be based on a unified theory of levels of Reality. We are part of the ordered movement of Reality. Our freedom consists in entering into the movement or perturbing it. Reality depends on us. *Reality is plastic*. We can respond to the movement or impose our will of power and domination. Our responsibility is to build sustainable futures in agreement with the overall movement of Reality.

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¹⁹ Peirce, 1976, vol. IV, p. 383-384.

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