

## Column on Transdisciplinary Realism

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### Introduction

Semiotics, social science, the second-order cybernetics and system science are attempts at transdisciplinarity, but they largely tend to ignore basic notions of transdisciplinarity as the included middle and the Hidden Third. In fact, they lack the crucial connection between subject and object. The transdisciplinary approach (Nicolescu, 2002), with its unique way of combining ontology, logic and epistemology, could therefore inject much fertility into these fields.

In the present column, I will explain why the metaphysics of transdisciplinarity, radical distinctive from social constructivism, is the most beneficial for the development of second-order cybernetics.

We will also compare the continuous interconnectedness of transdisciplinary Reality with Peirce's synechism.

### Levels of Reality as Ontological Levels

The key concept of the transdisciplinary approach to nature and knowledge (Nicolescu, 2002) is the concept of levels of reality.

Here the meaning I give to the word *reality* is pragmatic and ontological at the same time. By reality I intend first of all to designate that which resists our experiences, representations, descriptions, images, or even mathematical formulations. In so far as nature participates in the being of the world, one has to assign also an ontological dimension to the concept of reality. 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.

Of course, one has to distinguish 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 forever, while reality is accessible to our knowledge.

By *level of reality*, I designate a set of systems which are invariant under certain general laws (in the case of natural systems) and under certain general rules and norms (in the case of social systems). 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, rules or norms and a break in fundamental concepts (like, for example, causality). Therefore there is a discontinuity in the structure of levels of reality.

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A new *principle of relativity* emerges from the coexistence between complex plurality and open unity in our approach: No level of reality constitutes a privileged place from which one is able to understand all the other levels of reality. A level of reality is what it is because all the other levels exist at the same time. This principle of relativity is what originates a new perspective on human sciences, religion, spirituality, politics, art, education, history, and society: When our perspective on the world changes, the world changes.

In other words, our approach is not hierarchical. There is no fundamental level. But its absence does not mean an anarchical dynamics, but a coherent one, of all levels of reality, already discovered or which will be discovered in the future.

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 entire reality: we have also to consider the subject and its interaction with the object.

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 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. We have work to do till the end of times.

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

Inspired by the phenomenology of Edmund Husserl, I assert that the different levels of reality of the object are accessible to our knowledge thanks to the different levels of reality of the subject which are potentially present in our being.

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. The unity 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 *spiritual information* that coherently cuts across different levels of reality of the subject must correspond to the flow of *natural 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 I will call this interaction term the *Hidden Third* (Nicolescu, 2015).

My ternary partition { subject, object, Hidden Third } is, of course, different from the binary partition { subject vs. object } of classical realism.

The emergence of at least three different levels of reality in the study of natural systems—the macrophysical level, the microphysical level and cyber-space-time (to which one might add a fourth hypothetical level—that of superstrings, unifying all physical interactions)—is a major event in the history of knowledge.

Based upon our definition of levels of reality, we can identify other levels than the ones in natural systems. For example, in social systems, we can speak about the individual level, the social level, the geographical and historical community level (family, nation), the cyber-space-time community level, the planetary level and the cosmic level.

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 logic which allows us to jump from one level of reality to another level of reality. The basic ternary structure ( $A$ , non- $A$  and  $T$ ) shown in Figure 1 indicates that the relation between different levels of reality is realized through the included middle logic.

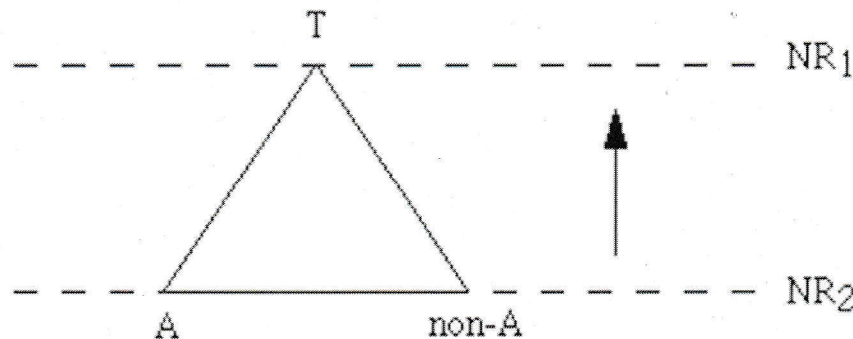


Figure 1. Symbolic representation of the action of the included middle logic.

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.

If one remains at a single level of Reality, all manifestation appears as a struggle between two contradictory elements (example: wave  $A$  and corpuscle non- $A$ ). The third dynamic, that of the  $T$ -state, is exercised at another level of reality, where that which appears to be disunited (wave or corpuscle) is in fact united (quantum) and that which appears contradictory is perceived as non-contradictory.

It is the projection of the *T*-state onto the same single level of Reality which produces the appearance of mutually exclusive, antagonistic pairs (*A* and non-*A*). A single level of reality can only create antagonistic oppositions. It is inherently self-destructive if it is completely separated from all the other levels of reality.

Levels of reality are radically different from levels of organization as these have been defined in systemic approaches. Levels of organization do not presuppose a discontinuity in the fundamental concepts: several levels of organization can appear at one and the same level of reality. The levels of organization correspond to different structures of the same fundamental laws.

Levels of organization are not ontological, while levels of reality are ontological.

The levels of reality are not stages in the evolution of knowledge but strata existing in reality.

To understand this fact, take as an example the macrophysical level, ruled by Einsteinian laws and the microphysical level, ruled by quantum laws. Both the Einsteinian laws, on one side, and the quantum laws, on another side, are true: one is not obtained as a continuous limit of the other. They are not social constructs. We discover them, but we do not invent them.

Take now as an example of levels of organization the Marxist economy and the liberal economy, belonging to just one level of reality—the social level. They are not true or wrong—they are just models. They are social constructs. We do not discover them—we invent them.

Till now, social science, the second-order cybernetics and system science are based upon the classical realism. Of course, second-order cybernetics introduces an observer. But an observer is not a subject. An observer is, in fact, just another object or cybernetic process which analyses a system, like an instrument of measure. The metamorphosis of the observer into a subject occurs only if the Hidden Third is present. As one important French philosopher asserted, the subject became just a word in a phrase (Descombes, 2004).

Moreover, social constructivism goes into a dead end because it eliminates the concept of truth, which is basic for defining science. If nothing is ontological, what kind of science we are speaking about? As remedy, social science and second-order cybernetics tried to introduce transdisciplinarity but in fact they consider only *transversality*, which is not transdisciplinarity. Transversality crosses several levels of organization but it remains inside just one level of reality.

### **The Hidden Third and Peirce's Synechism**

The transdisciplinary Object and its levels of reality, the transdisciplinary Subject and its levels of reality and the Hidden Third define *transdisciplinary Realism*, which is fully exposed in Figure 2 (Nicolescu, 2002).

On the left of the figure we show the object with its levels NR. On the right of the figure we show the subject with its levels of perception NP.



The logic of the included middle is capable of describing the coherence among these levels of reality by an iterative process defined by the following stages: (1) A pair of contradictories ( $A0$ , non- $A0$ ) situated at a certain level of reality is unified by a  $T1$ -state situated at a contiguous level of reality; (2) In turn, this  $T1$ -state is linked to a couple of contradictories ( $A1$ , non- $A1$ ), situated at its own level; (3) The pair of contradictories ( $A1$ , non- $A1$ ) is, in its turn, unified by a  $T2$ -state situated at a third level of reality, immediately contiguous to that where the ternary ( $A1$ , non- $A1$ ,  $T1$ ) is found. The iterative process continues to indefinitely until all the levels of reality, known or conceivable, are exhausted.

In other words, the action of the logic of the included middle on the different levels of reality induces an open structure of the unity of levels of reality.

There is certainly a coherence of the unity of levels of reality, as shown by the scientific connection between the infinitely small and the infinitely large scales, but this coherence is oriented in a certain direction: there is an arrow associated with all transmission of information from one level to the other. As a consequence of this, if coherence is limited only to certain levels of reality, it stops both at the highest level and at the lowest level. If we wish to introduce the idea of a coherence which continues beyond these two limiting levels, so that there is an open unity, we must conceive the unity of levels of reality as a unity that extends by a zone of nonresistance to our experiences, representations, descriptions, images, and mathematical formulations.

The coherence of the unity of levels of reality is described by the Hidden Third which has a complex structure (see Figure 2): three coherence loops of the  $\infty$  shape crossing all levels of reality. One of the loops act, symbolically speaking, as an asserting force (going through all  $A$  points), the second one as a denying force (going through all non- $A$  points) and the third one as a conciliating force (going through all  $T$  points). Every  $\infty$  loop crosses levels of reality of the object, goes through the point of intersection  $X$  and continues through the levels of reality of the subject.

At a first glance, transdisciplinary realism, involving discontinuous levels of reality, looks in contradiction with Peirce's synechism. We recall what *synechism* means:

Synechism, as a metaphysical theory, is the view that the universe exists as a continuous whole of all of its parts, with no part being fully separate, determined or determinate, and continues to increase in complexity and connectedness through semiosis and the operation of an irreducible and ubiquitous power of relational generality to mediate and unify substrates. As a research program, synechism is a scientific maxim to seek continuities where discontinuities are thought to be permanent and to seek semiotic relations where only dyadic relations are thought to exist. (Esposito, 2016).

However, this idea of contradiction is a wrong conclusion.

Naively, one could think that discontinuity involves separateness. But *discontinuity* does not mean disconnected. All levels of reality are interconnected through the Hidden Third.

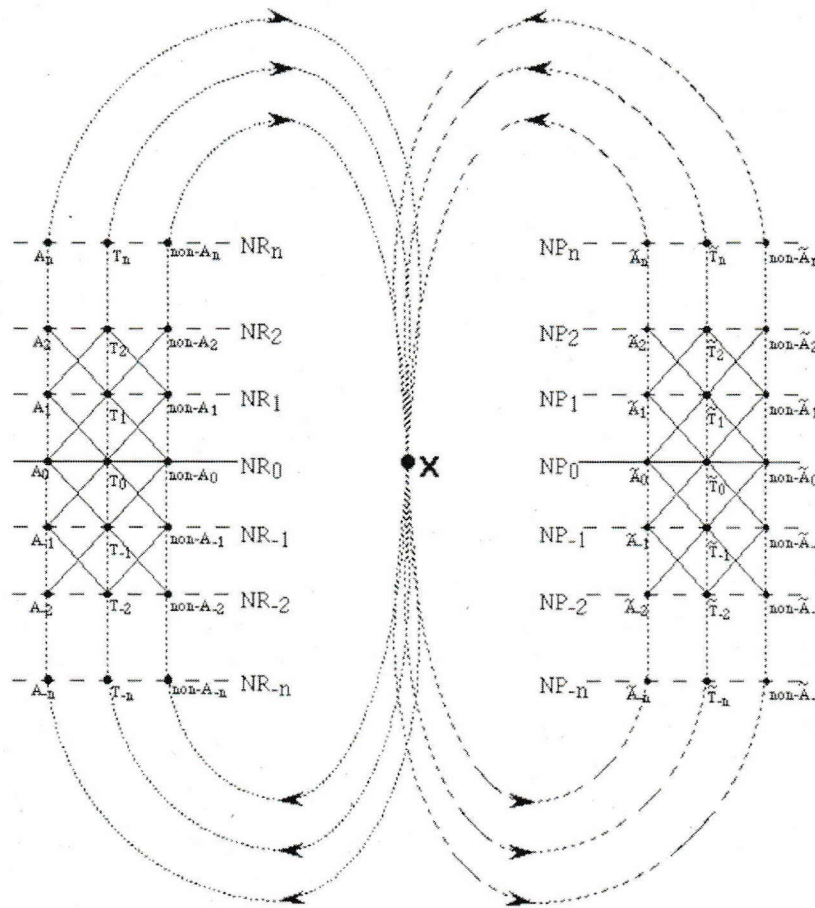


Fig. 2. The transdisciplinary Object, the transdisciplinary Subject and the Hidden Third.

In the framework of transdisciplinary Realism, the universe is conceived as a vast whole, as a vast cosmic matrix in which everything is in perpetual motion and energetically structuring. But this unity is not static; it implies differentiation, diversity, the emergence of hierarchical levels, and the occurrence of relatively independent systems, of objects as local configurations. The different systems are combinations of elements that are in an interaction that can never be reduced to zero: The lack of interaction would mean the death, the disappearance of a system, its decomposition into constituents through loss of information. The very existence of the Hidden Third means that the complex system is not just the sum of its parts and also that systems build systems of systems covering the full diversity of the world in a vast and ceaseless nonseparability, a real rescue for the existence of the systems. Nonseparability of complex systems involves a new type of causality, which we might call *global causality*, not in the sense of some external cause, but in the sense of the

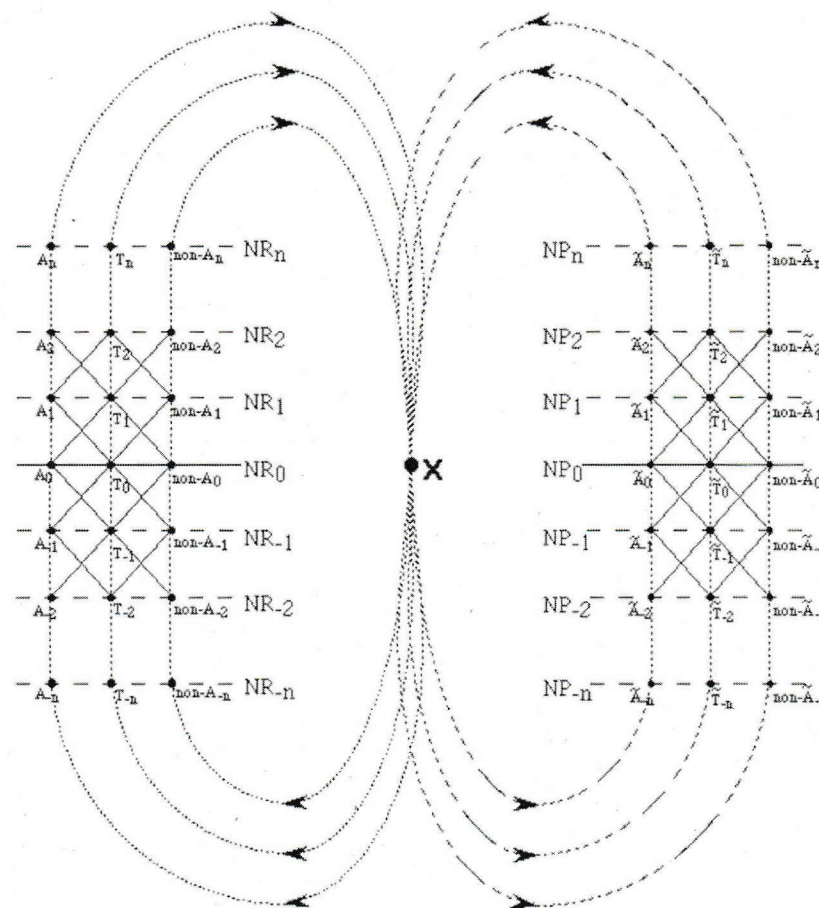


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whole of the system being involved in constituting its properties. Discontinuity and nonseparability are intimately related.

In other words, the Hidden Third restores the continuous interconnectedness of reality. The zone of non-resistance of the Hidden Third penetrates and crosses the levels of reality.

In transdisciplinary Realism, continuity and discontinuity are two facets of the same reality. Reality is both discontinuous and continuous. The opposition continuity/discontinuity is an artifact of the binary logic, which is not adapted to describe reality as a whole. A non-classical logic—the included middle logic—is necessary in order to describe, in a rational way, reality.

Let us now compare this continuous interconnectedness of reality with synechism.

It is clear, from the above considerations, that synechism is not in contradiction with transdisciplinary Realism. However, some ambiguities related with the work of Peirce need to be clarified.

Of course, the Hidden Third, as well as the notions of resistance and non-resistance, are not present in the philosophy of Peirce. This might explain why Peirce spent twenty years in trying to build his synechistic cosmology. He certainly felt a major obstacle in describing the interconnectedness of reality in a rational way. The permanent change and evolution in reality looked incompatible with the rationality of continuous laws. The key of the problem is that the discontinuous break in laws coexist with the continuity of just one law—the law of the laws—that of the action of the Hidden Third.

Another problem is the mathematical or non-mathematical description of continuity. In spite of the fact that Peirce spent a lot of time to describe continuity in a mathematical way, his depth of thinking on synechism went, in fact, well beyond mathematics. The permanent increase in complexity and connectedness of the universe cannot be described in a mathematical way. We cannot deal with a complex world in its all complexity. Every act of understanding involves a reduction of the complexity in order to be able to say something at all. This reduction inevitably has to leave certain aspects of complex reality out of consideration. It is not possible to find a frame which would include the whole. This is precisely what is meant by the Hidden Third. There will always be some excess which cannot be reduced to the rationality provided by the frame. The Hidden Third is rational, but is not rationalizable. The Hidden Third is not the opposite of reason: To the extent that it ensures the harmony between subject and object, the Hidden Third is part of the new, complex transdisciplinary rationality. The point here is that *rational* does not mean necessarily mathematical description.

Peirce clearly asserts that synechism is the view that to exist in some respect (*A*) is also to not exist (*non-A*) in that respect (CP 7.570). He therefore understood the necessity to go beyond the excluded middle logic: “the principle of excluded middle only applies to an individual” (CP 6.168), in other words to a system belonging to a given level of reality. As soon as we go from one level of reality to another level of reality we confront the breaking of laws. As Peirce himself asserts, the principle of



excluded middle “does not hold for anything general, because the general is partially indeterminate” (CP 1.434) This is in complete agreement with transdisciplinary Realism, based on the included middle logic.

It is understandable why the Hidden Third is the one that gives meaning to the included middle (or included third), because, in order to unite the contradictories  $A$  and non- $A$ , located in the area of resistance, it must cross the area of nonresistance. Therefore, there is an intimate relationship between the included middle and the Hidden Third. However, there is a big difference between the Hidden Third and the included middle: The Hidden Third is a-logical, because it is entirely located in the zone of non-resistance, while the included middle is logical, because it refers to the contradictories  $A$  and non- $A$ , located in the zone of resistance. But there is also one similarity. Both of them unite contradictory notions:  $A$  and non- $A$  in the case of the included middle, and subject and object in the case of the Hidden Third. Both the included middle and the Hidden Third capture the tension existing in and between the complex systems.

Peirce had the genial intuition that synechism and the category of Thirdness are related: “Continuity represents Thirdness almost to perfection” (CP 1.337). Thirdness, as an undecomposable element of the universe, is intimately connected with synechism. It is the category of mediation, regularity, and coordination, as well as of “generality, infinity, continuity, diffusion, growth, and intelligence” (CP 1.340).

Thirdness in transdisciplinary Realism is fully exposed in Fig. 1 as the ternary ontological structure { levels of reality of the object, levels of reality of the subject, the Hidden Third }. Another facet of Thirdness in Figure 1 is the ternary included middle structure {  $A$ , non- $A$ ,  $T$  }.

In fact, the Hidden Third is the supreme manifestation of Thirdness, that is, Thirdness acting in the whole interconnected universe.

## Conclusions

The Hidden Third, in its relationship with the levels of reality, is fundamental for the understanding of *unus mundus* described by synechism. Transdisciplinary Realism gives a solid foundation to the theory of synechism and could open new avenues of research in social science, the second-order cybernetics and system science.

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