

## **The Transdisciplinarity Connection: An Introduction to an Epistemological Approach to Improve the Dialogue between Science and Tradition**

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### **Abstract**

The main objective of the present paper is to offer an introduction to the transdisciplinary approach as an epistemological path to improve the dialogue between science and tradition. The first part is dedicated to reviewing the ancient and modern ways of building knowledge, by exploring the *Great Chain of Being* and explaining the antagonism that still exists between religion and science, both attempting to dominate. In the second part, the recent history of transdisciplinarity is presented and its main concepts are introduced. The final part proposes a channel to improve the dialogue using the scientific method.

### **Le lien transdisciplinaire: une introduction à l'approche épistémologique pour améliorer le dialogue entre la science et la tradition**

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### **Résumé**

L'objectif principal de cet article est de proposer une introduction à l'approche transdisciplinaire en tant que voie épistémologique pour améliorer le dialogue entre la science et la tradition. La première partie est dédiée à l'examen des méthodes anciennes et modernes pour développer la connaissance, en explorant la *grande chaîne de la vie* et en expliquant l'antagonisme qui existe toujours entre la religion et la science, les deux ayant pour objectif de dominer la scène. Dans la deuxième partie, l'histoire récente de la transdisciplinarité est présentée et ses notions principales sont introduites. La dernière partie ouvre une voie en vue d'améliorer le dialogue, partant de la méthode scientifique.

### **La Conexión Transdisciplinaria: Una introducción a un acercamiento Epistemológico para mejorar el Dialogo entre Ciencia y Tradición.**

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### **Resumen**

El principal objetivo de este presente documento es el ofrecer una introducción al acercamiento transdisciplinario como un camino epistemológico para incrementar el dialogo entre la Ciencia y la Tradición. La primera parte es dedicada a la revisión de las formas antiguas y modernas de la creación del conocimiento, explorando la Gran Cadena del Ser y explicando el aun existente antagonismo entre la religión y la Ciencia, con ambas enfocadas en dominar un solo escenario. En la segunda parte, la historia reciente de la transdisciplina es presentada y sus principales conceptos son introducidos. La parte final abre un canal para incrementar el dialogo comenzado desde el método científico.

## **A Conexão da Transdisciplinariedade: Uma Introdução a uma Abordagem Epistemológica para Aprimorar o Diálogo entre Ciência e Tradição**

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### **Abstrato**

O principal objetivo do trabalho atual é oferecer uma introdução a abordagem transdisciplinar como um caminho epistemológico para aprimorar o diálogo entre ciência e tradição. A primeira parte é dedicada a revisar a forma antiga e a moderna de construção de conhecimento, explorando a *Grande Cadeia do Ser* e explicando o antagonismo ainda existente entre religião e ciência, ambas destinadas a dominar a cena. Na segunda parte, a história recente da transdisciplinariedade é apresentada e seus principais conceitos introduzidos. A parte final abre um canal para aprimorar o diálogo iniciado a partir do método científico.

### **Die Transdisciplinaritaetsverbindung: Einfuehrung zu einem epistemologischen Ansatz zur Verfeinerung des Dialogs zwischen Wissenschaft und Tradition.**

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### **Zusammenfassung**

Das Hauptanliegen der vorliegenden Schrift ist eine Introdution zu bieten zu einem transdisciplinarischen Ansatz fuer einen Epistemologischen Weg zum Dialog zwischen Wissenschaft und Tradition. Der erste Teil ist einem Rueckblick auf altertuemliche und moderne Methoden des Wissensbildens, gewidmet. Weiterhin befasst er sich mit dem Erforschen der *grossen Kette des Seins* und der Erklaerung des immer noch existierenden Antagonismus zwischen Religion und Wissenschaft, waehrend beide darauf zielen, die Scene zu dominieren. Im zweiten Teil wird die neuere Vergangenheit der Transdisciplinaritaet vorgelegt und deren Hauptkonzepte eingefuehrt. Der letzte Teil eroeffnet einen Kanal zur Verfeinerung des Dialoges, indem von der wissenschaftlichen Methode ausgegangen wird.

**Key-words:** Tradition, Science, Religion, Transdisciplinarity, Great Chain of Being

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### **Introduction**

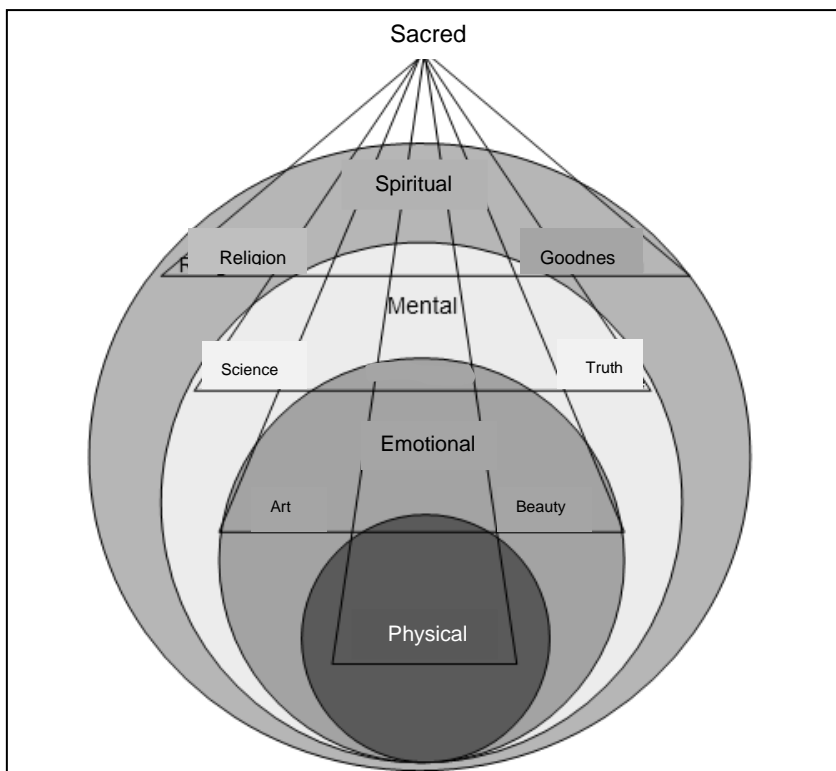
Since the beginning of the modern era, when the rupture between Science and Religion occurred, there have been many unsuccessful attempts to restore the dialogue between these two types of knowledge. This has been the case because the epistemological natures of science and tradition are very different, thus making dialogue difficult. However, this was not always the case. There was a time when each of them accepted the knowledge produced by the other, although religion often trespassed into the area of science. Time passed, and the situation reversed itself. Science began to dictate the rules

in the religious field, primarily by denying its authority to recognize reality. No matter how diligently science and religion tried to reconcile, they could not find the right mediating element to attain harmony. Nonetheless, this possibility is now provided by transdisciplinarity, which is the subject of the present article. The first part of this work addresses the rupture between science and religion; the second part presents a brief history and the main concepts of transdisciplinarity; and the third part introduces the bases to improve the science-tradition dialogue.

### **The Great Chain of Being and the Antagonism between Science and Tradition<sup>1</sup>**

Until the advent of the modern era—around 1600—reality was understood through a classic vision called the *Great Chain of Being*,<sup>2</sup> a multidimensional structure in which higher levels of reality comprised and contained lower levels of reality within a great hierarchy. Such a structure could be understood in its different nuances, depending on the approaches used by different schools, religions, or traditions. It was possible to observe at least five dimensions or levels of reality in that structure:

1. The non-dual Sacred element from which
2. the Spiritual Level—consisting of the mystic dimension—emanated; which contained
3. the Mental Level—consisting of the rational dimension; which contained the
4. the Emotional Level—consisting of the psychological dimension; and
5. the Physical Level—consisting of the chemical, physical, and biological material dimension (see figure 1).



**Figure 1—The Great Chain of Being—adapted by the author**

Conceptions such as this have existed—and still exist—in various cultures and traditions. It was serious, profound, and highly respected knowledge, since an epistemological pluralism ruled. This meant that the different schools or “disciplines” investigating the Great Chain of Being produced pieces of knowledge that were considered relevant. Such investigation was carried out in an empirical form, through experimentation, and the pieces of knowledge obtained were systematized in teachings grouped under Arts, Science, and Religion (see figure 1).

Despite the beauty that can certainly be found in this idea, in a remote past some religions used their influence based on these kinds of ideas to dominate all areas of knowledge, dictating rules that have been followed too strictly. The example provided by the Inquisition in the Catholic Church is widely known. Situations like that almost caused Galileo to be burned at the stake because religious knowledge usually prevailed during this period. This approach still exists in fundamentalism, a religious phenomenon which has been extensively studied nowadays.<sup>3</sup>

The Modern Age was the first moment in human history when the relationship between these areas of knowledge was actually somewhat balanced. This was clarified by Max Weber when he established the differences among the Three Great Values: Goodness, Truth, and Beauty (see figure 1). Goodness was the responsibility of Religion (Traditions); Beauty, was the responsibility of Arts; and Truth, was the responsibility of Science.<sup>4</sup> Such differentiation allowed significant advances in the empirical investigation of Reality, preventing that harmful tendency that had prevailed until then: the invasion of a sphere by another, even when epistemological pluralism was the norm. It is important to remember that it was in the modern era that Rosicrucianism appeared in Europe.

In the Rosicrucian approach followed by AMORC, the following fragment can illustrate the concept of the ‘Great Chain of Being’ in its mythic or spiritual level:

To Being there has never been a beginning, for nothing cannot give rise to something. Darkness pervaded all before Light came, but Light came not from darkness, for darkness is the absence of Light. Light is an attribute of Being, for Being is always luminous in the radiation of its energy caused by its ceaseless effort to be.

The light was without warmth, so Being was therefore unfeeling. The light was without reflection, and so Being was therefore formless. Being, in its eternal movement and progress, expanded. Multitudinous became its forms and complex their nature. The evolving complexity of Being gave rise to density, and density brought forth warmth from light. Then there came into existence living things.

With Life came the sensitivity of Being, developing into the magnificence of the realization of Self. In the human consciousness were reflected the glories of the universe. In its depth Being took sentient form, and Mind assigned it dimension.<sup>5</sup>

It is worth noting that AMORC understands the Great Chain as a three-fold holarchy consisting of the following elements: Light, Life, and Love.

1. Light refers to the Sacred dimension, to the non-dual Spirit that emanates and contains
2. Life in all its comprehensiveness and complexity, which contains and includes
3. Love, which is located within the human heart. Such involitional movement of the Spirit—or Sacred—generates human Consciousness that, in turn, promotes the evolution of the Spirit.<sup>6</sup>

After having established the differentiation among the Three Great Values, the mutual conflict subsided. At that point in the modern period, it was possible to investigate the Great Chain of Being with total freedom. It was based on this differentiation that democracy emerged, slavery was abolished, and medicine obtained countless advances. However, this led to a specialization of knowledge and very quickly, the dialogical differentiation gave place to a reductionist dissolution. As a result, epistemological pluralism was gradually replaced by a form of epistemological monism in the hands of science, which began to reduce the investigation of reality to merely the physical level of the Great Chain, consisting of sensory-motor empiricism. It was then that scientism emerged.

Materialist science purported to prove that the soul or spiritual process operated at brain level, which constituted a mortal blow to the approach of the Great Chain of Being. This resulted in its abandonment and complete dissolution by the kind of epistemological approach then in force. Consequently, both Beauty and the Good were abandoned at the expense of Truth. Only materialistic science was able to explain reality.<sup>7</sup>

However, religion reacted immediately to the insurrection of science, and made a strategic alliance with many European monarchs to explore the New World. Thus, while science grew in Europe, a religious dictatorship was imposed on the Indigenous American peoples which caused them enormous suffering.

Such situations generated a deep antagonism between science and religion (tradition), primarily among the great established Western religions. Very prominent theoreticians, such as Freud, Marx, and others, devised approaches that negated the existence of the Sacred or Spiritual level.

Obviously religion, tradition, and art continued to explore the Great Chain, although they too lost communication among themselves due to the rapid rise of disciplinary specializations which eventually included even their disciplines.

Throughout the centuries of Modernity, and mainly in post-modern times as the present day is called, there have been many attempts to resume the dialogue among the spheres of the Great Chain in order to reconcile different areas of knowledge, apparently without much success. This situation led to the existence of five basic attitudes that reflect such confrontation (or failure). They are:

1. Science denies any validity to religion and tradition.
2. Religion—or tradition—denies any validity to science.
3. Science is only one of the many valid modalities of knowledge.
4. Within science it is possible to find plausible arguments to explain the Spirit—the Sacred.

5. Science—or Truth—does not exist, only interpretations do.

Today, movements that present some epistemological consistency are beginning to emerge within post-modern tendencies, and are beginning to gain enough credibility in the scientific community to reconnect science and religion. Transdisciplinarity is one of those movements.

### **The Transdisciplinary Approach—Its Brief History and Main Concepts**

Officially, transdisciplinarity began with Jean Piaget and others in the 1970s. It originally meant a stage above interdisciplinary where there are no stable boundaries between the disciplines.<sup>8</sup> This definition is important, however it can also be dangerous for it can lead to a mistaken view that might see transdisciplinarity as a kind of *hyperdiscipline* or a *Science of Sciences* thus concealing its true and most important meaning.

Indeed, the transdisciplinary scientific approach is founded on the freedom of thinking beyond disciplinary boundaries. This does not mean that transdisciplinarity denies disciplinarity or interdisciplinarity. The aim of transdisciplinarity is the comprehension of the present world, of which one of the imperatives is the unity of knowledge. As its prefix “trans” indicates, transdisciplinarity concerns that which is at the same time between disciplines, across different disciplines, and beyond all disciplines.<sup>9</sup>

From the 1970s on, events have emerged bringing the scientific community together around the need to recover the integrity of the fractured knowledge. In these cases, documents were produced which have become important references for establishing transdisciplinarity as a scientific movement. A brief review of its history of these signal events follows.

In 1986, Venice hosted the “Symposium on Science and the Boundaries of Knowledge: the Prologue of Our Cultural Past” in which the “Declaration of Venice” was produced, strongly emphasizing the need for a dialogue between Science and the Traditions, the importance of respecting diversity, also the emergence of a new rationalism and a new metaphysics.

In 1991, Paris hosted the “Congress on Science and Tradition: Transdisciplinary Perspectives for the twenty-first Century.” That event exposed the weakening of cultural diversity by the belief in the existence of a single level of reality, and launched the challenge of thinking of a Planetary Civilization.

In 1994, Arrabida (Portugal) held the most important event in the area of transdisciplinarity to date: the “First World Congress on Transdisciplinarity” in which the Charter of Transdisciplinarity was produced emphasizing in its fifteen articles that transdisciplinarity is:

- contrary to reductionism;
- complementary to a disciplinary approach;
- understanding of reality as something multi-referential;
- accepting of values favorable to dialogue;
- respectful of differences;



- understanding that the economy must serve human beings;
- approving of scientific research being guided by rigor, tolerance, and openness.

In 1997, Locarno (Switzerland) hosted the “International Congress: Which University for Tomorrow? Towards a Transdisciplinary Evolution of the University,” in which the unification of the subject and the object into a connoisseur-subject was discussed. This was important given the fact that Modern Science was born through a violent divorce from the older vision of the world. It was founded on the idea—surprising and revolutionary for the time—of a total separation between the knowing subject and reality, assumed to be completely independent from the observing subject. Such a separation allowed science to develop independently from theology, philosophy, and culture. It was a positive act of freedom. But today, the extreme consequence of that division, incarnated in the ideology of scientism, has turned into the potential danger of the self-destruction of our species.<sup>10</sup>

In 2000, Zurich held the “International Transdisciplinary Conference,” which produced the “Zurich’s Declaration” emphasizing the importance of reconciliation among Science, Arts, and Spirituality; the importance of the integral (inner and outer) development of human beings; the importance of intuition, imaging, and body for true education; the integration of Science, Economy, Democracy, Metaphysics, Epistemology, and Poetry. At the same event, the three columns sustaining transdisciplinarity were presented: Complexity, Dialogics, and Levels of Reality.

In 2005, in Vila Velha (Brazil), the “Second World Congress on Transdisciplinarity” took place, in which the “Message of Vila Velha” was produced emphasizing the need for a better appropriation of the “Charter of Transdisciplinarity” and the need to integrate the various areas of knowledge in addition to creating more effective actions inside the university.

The transdisciplinary approach does not oppose the disciplinary specialization of science simply because it departs from this specialization. It remains committed to the unity of knowledge. It recognizes three axioms that guide its methodology:

1. **The Ontological Axiom:** There are, in Nature and in our knowledge of Nature, different levels of reality and, correspondingly, different levels of perception.
2. **The Logical Axiom:** The passage from one level of reality to another can be apprehended by the logic of the included middle.
3. **The Complexity Axiom:** The total structure of levels of reality—or perception—is a complex structure: every level is what it is because all the levels exist at the same time.<sup>11</sup>

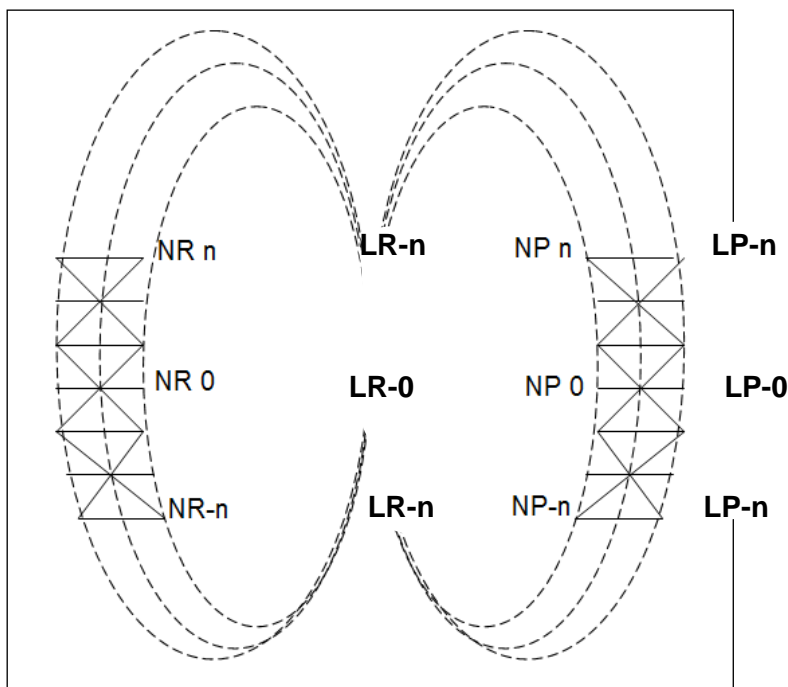
The concept of Levels of Reality is pivotal in the transdisciplinary approach. However, the three axioms are closely linked. This axiomatic set could constitute a new paradigm for science: the Complexity Paradigm.<sup>12</sup>

Levels of Reality are complex structures governed by their own laws which confer consistency on them. Such laws are structured from an adequate logic accessible to levels of perception that form a complex whole or, in Arthur Koestler’s words

“holons,” wholes that are simultaneously parts,<sup>13</sup> since they are also considered part of a larger whole.

Although each level has its own logic, they are only possible from a logical comprehension of this incompleteness, which is done through the logic of the included middle. A new Principle of Relativity emerges from the coexistence between complex plurality and open unity in this approach: no level of reality constitutes a privileged place from which one is able to understand all other levels of reality. A level of reality exists or is established because all the other levels exist at the same time. This Principle of Relativity is what originates a new perspective for religion, politics, art, education, and social life. Underlying this thought is the assumption that when our perspective of the world changes, the world changes. In his *Pedagogy of the Oppressed*, Paulo Freire—the great Brazilian educator—asserts that stating a true word is the same as transforming the world.<sup>14</sup>

Nicolescu created a diagrammatic representation for the levels of Reality (see figure 2).



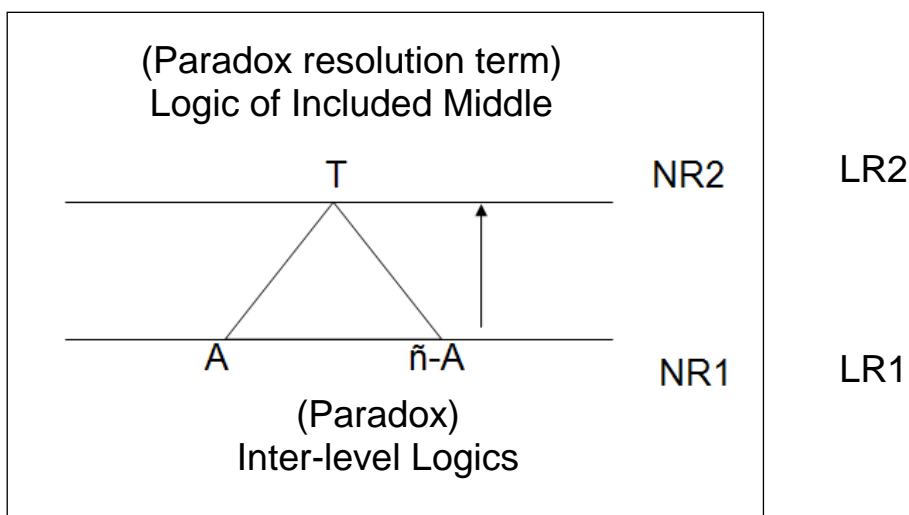
**Figure 2—Structure of Levels of Reality—simplified by the author**

This diagram is presented here in a simplified version, in which it is possible to observe the open structure of reality in infinite levels of reality (LR)—to the left—and also the infinite levels of perception (LP)—to the right—which correspond to the logic from which the levels can be understood.

The levels of reality are the object of transdisciplinarity, starting from the levels of perception associated to them and identified as their subject. Each level of reality has an apprehensible consistency through its own logic. However, as mentioned before, the levels are incomplete *per se*. This means that their limitations can be found in their own laws or, in other words, in their own logic. Therefore, the resolution of a problem on the edge of the logical comprehension of a level can be found only on the basis of another.



Thus, an inner level paradox can only be solved in another level of reality, using another type of logic. Very often, this is how the levels reveal themselves to their observers, and it is exactly what happened when the Quantum Level was discovered. The classic logic (binary logic) used to understand the macrocosm was no longer useful to explain the reality of matter for, in the quantum universe (microcosm), the principle of identity of classic logic is not valid. So it was only possible to understand microcosm from the point of view of a non-classical logic. In figure 3, there is a diagrammatic representation of a ‘cut-off’ from figure 2, or a level of reality (LR), consisting of—as already stated—a level of perception (LP).<sup>15</sup>



**Figure 3—Section of a Level of Reality and the logic of Included Middle**

As the levels of reality constitute “whole-parts,” not only the “highest but also the lowest” have to be united by a common element. Like a necklace whose beauty can only be created by an “invisible thread” that runs through its beads and keeps them united, the transdisciplinary point of view represents that “uniting thread” that is named the “zone of non-resistance” that—like the necklace’s thread—is hidden or veiled—yet runs through all levels and keeps them cohesive. Such a “zone” corresponds to that which is kept veiled and is not submitted to any reduction. In the diagram presented in figure 2, this corresponds to “point X” from which all levels of reality emanate (and converge) and that corresponds to the Sacred. Therefore, transdisciplinarity which is complementary to disciplinary knowledge reinstates the Sacred into the realm of Science.

### **Bringing Transdisciplinarity into a Dialogue between Tradition and Science**

It is difficult to reconcile science and tradition. Most of the preceding attempts failed due to the use of an epistemological basis that was inadequate to maintain such dialogue. In fact, the main goal of the disciplinary research or normative science is the external world—its Object—built by a binary logic. In general, this science has three postulates from classic physics as formulated by Galileo Galilei:

1. There are universal laws of a mathematical character
2. These laws can be discovered by scientific experiments
3. Such experiments can be perfectly replicated

Thus, research is concerned with just one level of reality or, in most cases, only with fragments of that specific level.<sup>16</sup> This approach was very successful in the development of technology in Western society. It resulted in many benefits that offered a more comfortable life style—though not necessarily healthier, and undeniably dangerous to the continuity of the human race, as the resources of the planet have been overused. Such success also contributed to the blindness of science to new approaches.

On the other hand, transdisciplinarity is a scientific approach that is gaining greater and greater relevance in the academic world. Its epistemology, history, and methodology point to the recognition and appraisal of an epistemological pluralism which reinstates the Sacred into the scientific view. It is important to realize that transdisciplinary knowledge is not antagonistic but complementary to disciplinary knowledge. Both methodologies are founded on a fully scientific approach. However, the goal of transdisciplinarity is the understanding of today's world, in which the unity of knowledge is imperative. This means that epistemological pluralism should be recovered. Transdisciplinary knowledge lies between the external world of the Object and the internal world of the Subject and, thus, in the dynamics generated by the interaction of all levels of reality at once.<sup>17</sup>

Therefore, as a scientific method, transdisciplinarity shares some elements with modern disciplinary science without opposing it. Their common element is the use of the scientific method which is not attacked or denied, but valued, for transdisciplinarity also makes use of it. This method consists of three basic elements:

1. Injunction
2. Experience
3. Confirmation<sup>18</sup>

Injunction is structured as an imperative proposition, a classically adopted path that leads to knowledge and becomes a path to be followed or a paradigm to be adopted to prove something. Injunction leads to direct experimentation of the data through which concepts are formed and expressed in scientific knowledge. However, both injunction and experience must be confirmed and verified by other people in order to be deemed as true in their observation of reality (see figure 4).

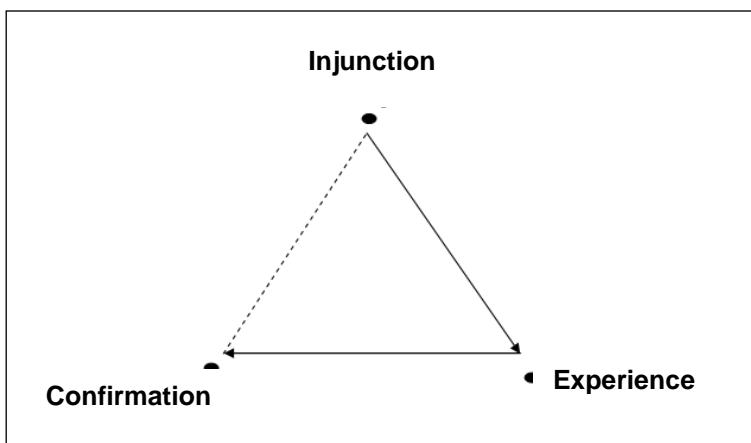


Figure 4—Elements of the scientific method

In its search for the unification of knowledge, transdisciplinarity recaptures, to a certain extent, the epistemological pluralism that was in force before the modern period, granting it consistency. Its formulations go beyond idealistic perspectives since they are based on a rigorous, tolerant, and open frame of mind, besides employing the scientific method. It has thus become a major contributor to knowledge by bridging the gap and settling the bases for reconciliation among the various areas of knowledge, primarily between science and religion. This reconciliation is dialogical and supported by the three axioms mentioned above:

1. Reality is formed by levels of reality, feasible to be apprehended by
2. The Logic of the Included Middle. These levels form
3. A Complex and irreducible whole, emanating from the Sacred, which is virtually inaccessible.

By introducing the concept of Level of Reality to science, transdisciplinarity harmonizes with the pre-modern concept of the Great Chain of Being on which the Traditions are firmly founded.

### **Conclusion and Resources for Further Exploration**

Since the advent of the discipline of Quantum Physics at the beginning of the twentieth century, the paradigm of conventional or official science faced a crisis. A paradigm is what members of a scientific community share,<sup>19</sup> and for as long as it prevailed reality was understood at just one level. However, with quantum theory that paradigm collapsed, for quanta did not comply with the principles of binary logic. Thus, part of the scientific community began to search for a new paradigm for the extraordinary science that had appeared, in which the concept of “level of reality” resumed the dialogue with the Great Chain of Being.

Therefore, many theorists who hold not necessarily similar but converging ideas in the field of physics are making important contributions to the establishment of this new scientific paradigm. With *The Tao of Physics* and other writings, Fritjof Capra opens an important channel to discuss Quantum Physics and the Chinese philosophy of the Tao. In *The Self-Aware Universe* and other works, Amit Goswami also suggests that a dialogue between science and religion (tradition) is possible. Ken Wilber’s work is also significant. Beginning from Transpersonal Psychology, his work gradually grows into an Integral Theory. His thought is deeply connected with Buddhist perspectives that refer to recovering the concept of the Great Chain of Being.

Regarding Western Esotericism, the most important work is Basarab Nicolescu’s *Science, Meaning, & Evolution: The Cosmology of Jacob Boehme*, where he discusses Boehme’s universe, connecting it with the transdisciplinary concept of Levels of Reality.

Science offers a global framework with which to interpret reality. Tradition (or religion), on the other hand, offers a local or a cultural framework to serve the same purpose. That is why dialogues usually evolve between a particular tradition and science as a whole. The transdisciplinary approach, however, pushes the dialogue beyond the

mythological dimension of traditions—or religions—through the ontological dimension where the Sacred remains untouchable.

### Notes and References:

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<sup>1</sup> In the present article, I used the word “Tradition” sometimes as a synonym of Religion (and vice-versa) because both explore the Spiritual Dimension of the Great Chain of Being.

<sup>2</sup> Arthur Lovejoy, *A Grande Cadeia do Ser* (São Paulo: Palíndromo, 2005); English: Arthur O. Lovejoy, *The Great Chain of Being: a Study of the History of an Idea* (New Brunswick, NJ: Transaction Publishers, 2009).

<sup>3</sup> For examples of studies on Fundamentalism, see Bruce B. Lawrence, *Defenders of God: the Fundamentalist Revolt Against the Modern Age* (Columbia, SC: University of South Carolina Press, 1995); Karen Armstrong, *The Battle for God* (New York: Ballantine Books, 2001); Stephen Larsen, *The Fundamentalist Mind: How Polarized Thinking Imperils Us All* (Wheaton: Quest Books, 2007).

<sup>4</sup> Ken Wilber, *A União da Alma e dos Sentidos: Integrando Ciência e Religião* (São Paulo: Cultrix, 1998); English: Ken Wilber, *The Marriage of Sense and Soul: Integrating Science and Religion* (Dublin: Gateway, 2001).

<sup>5</sup> Ary M. Arduíno *A Era de Aquário* (Curitiba: GLP-AMORC, 1987), 41-59.

<sup>6</sup> This conception resembles Jacob Boehme’s.

<sup>7</sup> Ken Wilber, *A União*, 49.

<sup>8</sup> Basarab Nicolescu “Transdisciplarity—Past, Present and Future” (Vila Velha, SC Brasil: II Congresso Mundial da Transdisciplinaridade, 2005)

<http://cettrans.com.br/novo/textos/transdisciplarity-past-present-and-future.pdf>

<sup>9</sup> Basarab Nicolescu, *O Manifesto da Transdisciplinaridade* (São Paulo: Triom, 1999), 46; English: Basarab Nicolescu, *Manifesto of Transdisciplinarity* (Albany: State University of New York Press, 2002).

<sup>10</sup> Basarab Nicolescu, “Transdisciplarity,” 2.

<sup>11</sup> Basarab Nicolescu, “Transdisciplarity,” 6.

<sup>12</sup> Edgar Morin, *Complexidade e Transdisciplinaridade* (Natal: EDUFRN, 1999).

<sup>13</sup> Ken Wilber, *Psicologia Integral* (São Paulo: Cultrix, 2000), 21; English: Ken Wilber, *Integral Psychology: Consciousness, Spirit, Psychology, Therapy* (Boston: Shambhala, 2000).

<sup>14</sup> Basarab Nicolescu, “Transdisciplarity,” 7.

<sup>15</sup> Bassarab Nicolescu, “Fundamentos Metodológicos para o Estudo Transcultural e Transreligioso.” *Educação e Transdisciplinaridade II*. Eds. Américo Sommerman, Vitória M. de Barros, Maria F. de Melo (São Paulo: TRIOM, 2000), 51.

<sup>16</sup> Bassarab Nicolescu “Levels of Reality and the Sacred” (Vatican City: International Conference Foundations and the Ontological Quest: Prospects for the New Millennium, Pontificia Universitas Lateranensis, 2002), 1.

<sup>17</sup> *Ibid.*, 3

<sup>18</sup> Ken Wilber, *Psicologia Integral*, 123.

<sup>19</sup> Thomas S. Kuhn, *The Structure of Scientific Revolution* (Chicago: The University of Chicago Press, 1970), 176.