



# Applied Transdisciplinarity through Plato Philosophy, Taoism, Alchemical Tradition and Jungian Psychology

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**T**ransdisciplinarity is a paradigm based on the integration and balance of opposite points of view (dualities). This paper methodology involves transdisciplinarity applied to problem solutions, mainly from 1) Plato philosophy; 2) Taoist principle of duality Yin Yang, 3) Jungian psychology, so connected to modern physics and 4) Weil, Leloup and Crema psychological vision of holistic transdisciplinarity. Our findings in this regard involves Figure 11 for Jungian functions and Figure 12 model for problem solving through duality plus four elements. The objective is to create a comprehensive understanding of reality through Plato and Taoist philosophies, Alchemical tradition and Jungian psychology improved by the MBTI system, as tools for problem solving. Understanding the psychological types to comprehend on how to achieve the best of each one, due to their innate strengths and capacities, so that a synergy of results can be created within the relationships. The MBTI serves both i) for self-knowledge, self-management on a day-to-day life, and ii) to understand how other people work psychologically, so that a synergy can be created in the process of relationships. The applied transdisciplinarity approach is based on the principles of i) duality – interaction and integration of opposites, specially the analytical and synthetic methods and ii) four elements – rationality, feasibility, reasonableness and meaning. However, it is not a simplistic or a magical-vitalistic approach as it may seem to rationalists at first, as far as modern physics is concerned. The holistic view of reality, including holology (the study of the whole) and holopraxis (the praxis of the whole) can't be confused with political ideology, something that happens very frequently to scientists, who consider themselves "exempt" and "impartial". Finally, the core idea is to promote transformation of the culture and personal behavior, connected to reasonableness and meaning, emotional and intuitive intelligences, mainly because of psychological sustainability and mental health.

**Keywords:** Transdisciplinarity, Plato, Taoism, Alchemical tradition, Jung.

<sup>1</sup>This paper is the sole responsibility of its author, not necessarily reflecting the view of any public institution.

# 1 Introduction

Transdisciplinarity can be presented as an emerging paradigm through dualities, some of them evidenced in Table 1, by *our griffins*, which are to evidence various paradoxes to be solved in transdisciplinary. Complementarity and dialectics are the basis for problem solutions. This paradigm comes specially from modern physics and Jungian psychology, both very correlated.

**Table 1:** Dualities in griffins – quotes from engineering, science, physics and psychology.

<i><b>Simplicity</b> is the ultimate <b>sophistication</b>.</i>	<b>Engineering and Science</b> Leonardo da Vinci
<i>We can't <b>solve</b> problems by using the same kind of thinking we used when we <b>created</b> them.</i>	<b>Physics and Science</b>
<i>The <b>intuitive</b> mind is a sacred gift and the <b>rational</b> mind is a faithful servant.</i>	
<i>We have created a society that honors the servant and has forgotten the gift.</i>	Albert Einstein
<i>[...] <b>splitting</b> this reality into an <b>objective</b> and a <b>subjective</b> side won't get us very far.</i>	
<i>[...] even when an individual tries to attain the greatest possible degree of independence, he will still be swayed by the existing spiritual structures - <b>consciously</b> or <b>unconsciously</b>.</i>	Niels Bohr
<i>One can never reach an exact and complete portrait of reality.</i>	
<i>(Reality is) the continuous <b>fluctuation</b> of the experience as captured by consciousness.</i>	
<i>In that sense, it can never be identified to a <b>closed</b> system.</i>	Werner Heisenberg
<i>The physics of the twentieth century showed us convincingly that there is no <b>absolute</b> truth in science, that all concepts and theories are <b>limited</b> and approximate.</i>	
<i>The time has come for other <b>sciences</b> to broaden their underlying <b>philosophies</b>.</i>	Fritjof Capra
<i>Until you make the <b>unconscious</b> <b>conscious</b>, it will direct your life and you will call it fate.</i>	<b>Psychology</b>
<i>To ask the right question is already half the solution of a problem.</i>	Carl Gustav Jung
<i>Nobody transforms anybody and nobody is transformed <b>alone</b>.</i>	
<i>We transform ourselves in the <b>encounter</b>.</i>	Roberto Crema

As shown in Table 1, such quotes are from eminent scientists. All of them converge to the principles of transdisciplinary, through the synthetic idea of integration and balance of opposites (dualities) for concrete management solutions. The idea is the integration between specialists and generalists, between the analytical and synthetic methods. Thus, the unity of applied knowledge and the understanding of reality is much more than the intellectual view of the questions. The main transdisciplinary vision – duality – is evident in modern physics, which discovered particle-wave duality at the beginning of the 20th century. Everything has a particle character (something concentrated) and wave (something expanded), even light, which in thesis would be only a wave, but is diverted by gravitational fields due to its particle character (its mass). One character predominates over the other, of course. Considering the light nature, wave character is dominant. This is for non-mechanical phenomena, not predictable by classical physics, the Cartesian paradigm or logic since Aristotle. In human phenomena this dual character is intrinsic. It is something close to platonic philosophy with regard to the theory of ideas, the duality of the world of the senses versus the world of ideas, portrayed in the myth of the cave. By the way, the Greeks invented logic based on mythology as well as the amphitheater (two theaters, the two therapeutic and cathartic forms of the satire, staged in the morning, and tragedy, in the afternoon). Therefore, logic did not appear isolated among the Greeks, it should be seen in the context of symbology, which complements logic for the understanding of the whole reality.

For example, Newton, the father of classical physics in the 17<sup>th</sup> century, was supposed to be aware of the limitations of his models, because, in addition to being a successful businessman, theologian and politician, most of his works involve the alchemical tradition – the symbolic field of mythology, from which the Greeks invented logic. Finally, the ancients already intuitively knew the transit between the analytical method (diabolical) and the synthetic (symbolic), in the Greek sense of *diabolos* as the one that septs and *symbolo* as the one that joins. Without the complementarity of the two visions, any diagnosis for problem solving is reductionist and unbalanced.

This paper methodology involves transdisciplinarity applied to problem solutions, mainly from 1) Plato philosophy; 2)

Taoist principle of duality Yin Yang, 3) Jungian psychology, so connected to modern physics and 4) Weil, Leloup and Crema psychological vision of holistic transdisciplinarity. Our findings in this regard involves Figure 11 for Jungian functions and Figure 12 model for problem solving through duality plus four elements.

The objective is to create a comprehensive understanding of reality through Plato and Taoist philosophies, Alchemical tradition and Jungian psychology improved by the MBTI system, as tools for problem solving.

## 2 Mythology and Greek Amphitheatre - Art

Opposed to linear rationality, mythology is the study of myths, legends and their interpretation in a culture, so important to understand the transdisciplinary duality mythology-rationality. Myths are complex folk or religious stories, reflecting the views of those who lived at the time they were created. It is usually a narrative in which one uses symbolic language, which seeks to portray and describe the origin and assumptions of some culture, in addition to explaining the creation of the world, the universe, or any subject that is difficult to understand. As a rule, mythology is related to the society of its origin. In various religions mythology is present in some way. According to Campbell [1], there are four functions of mythology:

- a) Mystique: reconciliation of consciousness with the preconditions of one's own existence. Examples: (i) when we prove the fruit of the tree of good and evil and lose animal innocence, or (ii) redeem the consciousness of the feeling of guilt;
- b) Cosmological<sup>2</sup>: formulate and transmit an image of the universe;
- c) Sociological: validate and maintain some specific social order, endorsing its moral code; and
- d) Psychological: shaping individuals according to the objectives and ideas of various social groups.

Cosmological and sociological functions change more radically over time, mainly due to advances in technology. For example, the revolutions and paradigm shifts caused by Copernicus' discovery in the 16th century that the earth revolved around the sun, abruptly changing the idea that the Earth was the center of the Universe.

On the other hand, mystical and psychological functions are more stable, somewhat independent of time and culture. These are the ones that most matter to the application that involve interpretation at the subject level, that is, symbolic, excluding those of merely objective character, that is, logical or analytical.

Several cultures see reality throughout history through this symbolic instrument of mythology. In this vein, Franz states that in the ancient Greek world there were no distinguished natural events external from the internal [2], something corroborated by the physicist Nicolescu, for whom the Premodern man had no will of his own, but a magical-vitalist vision of the world, in which everything would be an expression of God's will. Thus, the man of this period would have the subject immersed in the object. Nicolescu divides the relationship between subject and object into three periods of history. In pre-modernity the subject was immersed in the object. Everything was a dash or signature of a higher sense. The world of premodern man was magical. In modernity, subject and object are totally separated by a radical epistemological cut, thus allowing the development of modern science. The object was there, to be known, deciphered, mastered and transformed. In Postmodernity the role of the subject and the object are changed in comparison to modernity and reverted in comparison with Pre-Modernity: the object, then considered as outside the subject, however is a social construction. It's not really "there." It looks more like an emanation from the subject. In this context, the idea of transdisciplinarity leads to a new understanding of the relationship between subject and object. As in Modernity, subject and object remain separated, but are joined by immersion in a third element, which Nicolescu calls "Hidden Third", whose radius of action is infinite.[3]

The Greeks were an exception in Premodernity, to them does not apply this dominant question in the Middle Ages posed by Nicolescu. The Greeks became rational, invented logic from mythology, brought myths to logic, something that gnawed philosophy and then science. In addition, they were forerunners of the theater, recognized today as one of the forms of therapy. Tragedy is a way of dealing with the suffering of life, as in a process of catharsis, recognizing it. Satire is the way to laugh at this suffering, using humor to make it lighter. In the Greek theater in the morning the satire was staged and in the afternoon the tragedy. Those are rituals comprising the current idea of the theater, whose current symbol is the image of the two masks together, the comical and the tragic. By the way, the Greeks did their stagings with masks, which inspired Jung in his psychological concept of persona. It is the mask in terms of the social role that we interpret, as in the theater. [4]

The persona can have two types of behavioral deviations, according to Hall: (a) excessive development, and even the individual can identify with his persona, something very common in artists who have become icons, leaves the impression of not existing within a real person, when not he is at work; and (b) inadequate or insufficient development, which prevents the individual from fulfilling his social role properly, making him vulnerable to rejection. [5]

Many references of Western culture have been inherited from the Greeks, including various terms that cannot be translated, such as cosmos, chaos, and logos. However, there was an essential difference from the ancient Greek view that developed logic to the present – the transit between mythology and logic, something that has been lost today, leaving dominantly the logic in our Western culture, to limit the view of reality by mere comparisons and relationships of linear cause and effect.

According to psychiatrist and theater director Bernardo de Gregório, for the Greeks there was a duality between chaos = disorder and cosmos = order. In addition, they invented logic, which comes from logos, hence the meaning of the cosmological term, the logic of the order of the universe.

<sup>2</sup>According to psychiatrist and theater director Bernardo de Gregório, for the Greeks there was a duality between chaos = disorder and cosmos = order. In addition, they invented logic, which comes from logos, hence the meaning of the cosmological term, the logic of the order of the universe [15].

As reference for transdisciplinarity, Jung was much more than a dissenting psychiatrist from Freud, He developed his own theory of the psyche based on ancient traditions, philosophies, art and modern physics. In addition to moving on to philosophy and ancient traditions, he lived with modern physicists, so that he understood science, philosophy, traditions and even art well through his Red Book with revealing drawings made by himself (see Figure 1).



Source: drawing by Jung in his *Red Book* of 2009, released much later than his death in 1961. The picture is a variation of celtic cross

**Figure 1:** Celtic cross drawn by Jung himself.

Another way of seeing duality in art can be through the symbol of theater as shown in Figure 2. The Greeks were their forerunners. The staging of tragedy is a way of dealing with the suffering of life, as in a process of catharsis, recognizing it. Satire is the way to laugh at this suffering, using humor to make it lighter. They are two complementary forms of therapy. Those are rituals that composed the image of the two masks together, the comic and the tragic, which inspired Jung with the psychological idea of persona, as a mask that each one is obliged to put on his professional and/or social role.[4]



**Figure 2:** The symbol of theater – comedy and tragedy (Source: one of many variations available on internet).

Moving from theater to the fine arts, the sphinx in Figure 3 is an important symbol of four elements throughout history. After studying Weil and Tompakow, we deem that it symbolizes the man integrated in all its aspects - physical, emotional, mental and intuitive, represented in the image with ox body, trunk and lion paws, eagle wings and man's head. The authors consider that in the ancient tradition the ox is linked to instinctive and vegetative life; the lion to emotional life; the eagle to mental life (intellectual and spiritual); and finally, man is the whole, the consciousness and dominion of the three previous unconscious.[6]

It happens that the eagle may have a double symbolic meaning, representing both thought and spiritual intuition. Depending on the context, it means only spiritual life, intuition, such as the symbol of the dove of the Holy Spirit, or it may be only the air, the thought. Thus, depending on the situation, the eagle, within the context of the four elements, can alternate in the position of intuition or thought or simultaneously of thought and intuition, as in the reading of Weil and Tompakow. The ox, the lion, the eagle and the man (in the form of an angel) are also the symbols of the four evangelists (Luke, Mark, John, and Matthew).

According to Leloup [7], in some Roman cathedrals Christ is often represented surrounded by a tetramorph. The bull represents Luke, the rooting in the earth (the sensation, Jung would say). The lion represents Mark, for in his gospel there is much passion (feeling, according to Jung). Man represents Matthew, for in his gospel there is a rational dimension (Jungian thinking). Finally, the eagle represents John, for his gospel is an invitation to contemplation and mystique (the Jungian function of intuition). Summing up the symbology of the evangelists:



**Figure 3:** The symbol of theater – comedy and tragedy ( Source: British Museum. Palace Guardian Nimrud, Assyria, 965 BC.).

- a) Luke - bull - sensation – earth.
- b) Mark - lion - feeling – water.
- c) Matthew - eagle - thinking – air.
- d) John - angel - intuition - fire.

### 3 Philosophy – Western Plato and Oriental Taoism

In our perception, Plato (427-347 BC) is perhaps the philosopher with the greatest influence on Early Christianity and European Alchemy, reaching even the Jungian and transpersonal psychological lines. Platonic philosophy is much discussed to this day, either by its capacity for synthesis, by universality or by the timelessness of its teachings. The philosopher presents in *The Republic* a dual concept of "world of ideas" versus "world of the senses" (ideal forms versus imperfect copies). These two (i) intelligible or sensitive and (ii) abstract or ideas worlds are the basis of their philosophy. For him the body has senses and the soul the reason. The soul is immortal and eternal; inhabits the world of ideas before our birth and wishes to return there after death. As we will see later, the theory of ideas would have been influenced by hermeticism. Also according to Plato, the task of philosophy is to ascend from the world of the senses to the world of ideas, and from this contemplate the idea of good. Thus, he defends the existence of the immortal and absolute world (of ideas), in the face of what is situated in the corporeal, mortal and relative world (of the senses); it also postulates the cycle of the soul in its passage through the two worlds, until it no longer needs to return to the world of the senses, which is conventionally called the theory of metempsychosis. However, a facet of the philosopher is little explored: that of duality - the rise to the world of ideas must then correspond to a process of descent, to accomplish the Good in the world of the senses. Thus, it is evident the prejudice that exists in our society that the adjective "platonic" is related to something idealistic, distant, outside reality, such as "platonic love", something to be deconstructed in the face of the opposition of the world of the senses versus the world of ideas from the transdisciplinary point of view.

Plato has shown the duality principle through the allegory or myth of the cave<sup>3</sup>, perhaps the most comprehensive in the history of mankind before the various possibilities of application as to: i) world of the senses or material within the cave and

<sup>3</sup>In our synthetic vision, the cave myth, or the cave allegory, deals with prisoners who from birth live chained in a cave, spending all the time facing a wall illuminated by the light generated by a campfire. On this wall are cast shadows representing people, animals, plants and objects, showing scenes and everyday situations. Prisoners can only see the images (shadows) reflected on the wall. If one of them manages to get rid of the currents to be able to explore the interior of the cave, he ends up finding an exit to the outside world and comes into contact with "reality", then being able to see the sun and the entire breadth of nature outside the cave. He realizes then that he has spent his whole life analyzing and judging only projected images. When you leave the cave and get in touch with the real world, you are delighted with what you see. He then returns to the cave to pass all the knowledge acquired to his companions, still trapped. However, he is ridiculed for telling everything he saw and felt, because prisoners can only see the wall with the shadows. The prisoners call him crazy, threatening him with death. It is perceived then, in the myth, a process of ascension (exit from the cave) followed by descent (back to the cave), a cyclic duality, as if in the idea of the spiral, that when each cycle is completed it never turns to the same point, given the evolution and conscientious development implicit in the process, which also reminds the cycle of transformations and Heraclitus.

ii) world of ideas or intuition outside the cave. The philosopher seems to be the most important power of synthesis and breadth that has been reported, perhaps the most debated to date. For him, the enlightened must rule the people. Although Plato criticized the oligarchy, the government of a few understood it as a degeneration of the aristocracy of philosophers well prepared to rule, which he defended. The current context is quite different from that of ancient Greece. Social networks create an environment with intrinsic wisdom, which perceives at some point the institutional deviations and narratives of the mainstream that do not fit with reality, such as the animal instinct before disasters and cataclysms. Therefore it does not seem reasonable, currently, for a minority to go to govern a majority through influences by narratives of opinions disguised in facts, or a supposed technoscience restricted to a few “enlightened”, so in the theory only those selected ones would know what is best for the population, reproducing in a certain way the platonic idea of oligarchy, but today as a possible degeneration of democracy. History teaches in this line as to the pre-Socratic philosopher Heraclitus (535-475 BC.) by considering that the balance of opposites leads to the unity of the universe, everything is in the process of change and the cycle of transformations takes place up and down [ ], even reflecting an hermetic principle, which leads to the idea of spiraling consciousness development, according to Jung. This also resembles the philosopher character in Plato’s cave myth, who leaves the cave and then returns to tell his fellow prisoners what he saw. In the end, it is dialectic so that the friction between opposites and the oscillation between them is for the learning process. Polarization crystallizes and disrupts this evolutionary process. After all, such “truths” can be an instrument of power, manipulation or domination through subliminal communication techniques.

In the pragmatic view of this author as an engineer, transdisciplinarity can be summarized by two requirements: duality and four elements, like in ancient philosophies and traditions.

Duality involves the dialectics of opposites, the thesis and the antithesis until synthesis is reached, when it comes to human phenomena. Obviously it can’t be applied to mechanical phenomena, whose variables are well behaved, where classical logic is used.

The four elements refer us to concepts of Greek philosophy and the European alchemical tradition, as to the principles: earth, water, air and fire. These translate, as to the physical states of matter, into liquid solid, gas and plasma.

After deeply studying Greek philosophy and alchemical tradition, Jung discredited the four functions of the psyche, based on the empirical observation of his patients. Such conscientious functions reflect the same principles, by order: sensation, feeling, thought and intuition. In a 1957 interview with psychologist Dr. Richard Evans, Jung made a parallel between the matter of our physical body and the psyche, the latter as a quality of matter, another aspect of matter.[8]

In this context fit the four ancient Greek visions of the human being, for Leloup soma, psyche, nous and pneuma. [9] and [10]:

- a) *soma* - like matter, physical body and sensations;
- b) *psyche* - like feeling, emotions and thoughts;
- c) *nous* - as the intuitive part (noetic);
- d) *pneuma* - the great vital breath that interpenetrates all things.

As a sum, psyche and nous represent the internal environment of the subject, in the context of the four elements to interact in dualities: introversion-extroversion, judgment-perception, feeling-thought, sensation-intuition and synthetic-analytical, pneuma represents the unity of the object’s external environment, where dualities cease.

Plato, in his dialogue The Republic [11] had already developed similar concepts regarding knowledge levels or dividing lines. By platonic epistemology (episteme in the sense of comprehensive knowledge in the transdisciplinary context):

- i) *noesis* is intellectual intuition, and episteme is knowledge acquired through noesis, it is synonymous with broader understanding in this context, it is not just about intellectual knowledge;
- ii) thinking, when contemplating forms or ideas, offers the rational view of knowledge (*dianoia*), as in mathematics;
- iii) *noesis* and *dianoia* then form knowledge in the sense of comprehensive understanding of platonic vision, as opposed to the opinion of the lower levels of *pystis* (belief or conviction) and *eikasia* (opinion by perception only).

Hence one can observe the parallelism between the Jungian functions and Plato levels:

- A) *Eikasia* - sensation (perception function).
- B) *Pistis* – feeling (belief is a form of feeling).
- C) *Dianoia* - thought (mathematics is a form of logical thinking),
- D) *Noesis* – comes from nous (spirit), means to understand the essence through intuition.

In addition, the following characteristics of the four Jungian functions are evidenced, which can be deduced from the MBTI System [13] for self-leadership and management training, an evolution of the psychological typology developed by Jung:

- a) Sensation – concrete.
- b) Feeling – subjective.
- c) Thinking – objective.
- d) Intuition - abstract.



Table 2: Plato's knowledge levels (divided lines A,B,C and D), Source: University of Florida [12].

		KNOWLEDGE		VS.	OPINION	
Stages of Cognition:	Objects of Cognition:	Intelligence = Reason = Dialectic	Thinking = Understanding	Belief = Faith = Conviction	Imagining = Perceiving	
		D	C	B	A	
	Form of the GOOD  Other Forms	Pure Mathematics  Applied Mathematics	Empirical Generalizations (hypotheses)  "science"	Visible "things"; common objects (trees, socks, etc.)	mirror images (reflections)	Shadows
	NOESIS = intelligence, or rational intuition  EPISTĒMĒ = knowledge  The method of obtaining EPISTEME is the Dialectic, meaning philosophical conversation by question and answer seeking an "account" (logos) of some Form.  Ultimately: knowledge of the Good.	DIANOIA = thinking Reasoning from premise to conclusion.  Actually, a bridge from the world of Opinion to that of Knowledge, brought about by higher education, especially mathematics.	PISTIS = common sense belief in the reality of visible objects and correct moral teachings (that is, sufficient guides for action), without knowledge of the reasons for such beliefs.	EIKĀSIA = imagining  Wholly unenlightened state of mind which takes sensible moral notions at face value, just as it takes sensible appearances of the "world" at face value.  The allusion is to the condition of the unreleased prisoners in the Cave allegory (Rep. 514 ff.)		

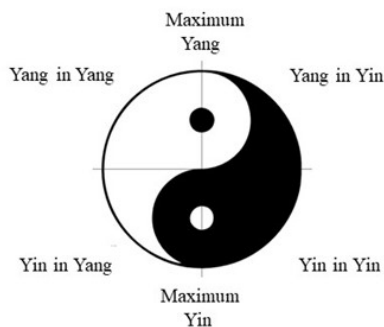
One of the best known images is revealed by Taoist philosophy: the Tai Chi diagram. Through Lao Tzu (6th century BC), Chinese philosophy already knew the principle of complementarity discovered by modern physics, found in one of the oldest concepts of duality, the Yin and Yang, used to describe how seemingly opposing forces are interrelated and interdependent in the natural world. This concept is at the center of several branches of Chinese science and philosophy, being one of the basic principles of its traditional medicine. Yin and Yang represent the idea of balance, where two opposites coexist in harmony, complementing each other and being able to transmute into each other. Some of the common associations with Yin and Yang are, respectively: dark and light, passive and active, female and male, rest and movement. In the Tai Chi Diagram shown below in Figure 4, the Yin is represented by the black part and the Yang by the white part. Thus, by the scheme there is a bit of Yin within the Yang and a little Yang inside the Yin, evidencing that each opposite contains a seed of the other. According to Taoism, within each independent entity there is a part of its opposite. Within the disease is health and vice versa. This is because opposites are actually manifestations of the unity of the Tao (the energy that maintains the natural order of the universe) and so are not independent of each other, but rather a variation of the same unifying force. In the West there are several misinterpretations according to which Yin and Yang correspond to good and evil, but Taoist philosophy prefers to focus on the idea of balance. The Tao, which means "conscious path", is struck by "non-action" - meditation, pondering, peace, simplicity, tranquility and harmony.

According to Jung, the Chinese terms Yin and Yang represent a conceptualization of the opposites needed to explain energy (the opposite of inert uniformity) that can only exist when these opposites are acting. The world cannot move without conflict, therefore. Yin and Yang are not only physical and metaphysical principles, but also psychological. They are quite different from our concepts because there is a peculiarity in the thinking of the Chinese, making them realize what happens inside and outside as being inextricably linked. We Westerners are unable to mix the two things, our mind has the prejudice of the "cause and effect" paradigm. But the Chinese believe that everything is connected with everything else. So they understand human psychology as simply a special case of spiritual principles.[14]

This ancient philosophy is also perceived in the well-known Buddhist principle of the "middle way", the balance between the opposite ends. By the way, the physicist Nicolescu, in the context of transdisciplinarity, similarly defends the logical axiom of the "included medium". The logic of the "included medium" is a tool for an integrative process: it allows us to cross two different levels of Reality or perception and effectively integrate the coherence of the Universe, not only in thought, but also in our own being. The use of this included third party is a process of transformation, which ceases to be a logical, abstract tool: it becomes a living reality by touching the dimension of our being. This is particularly important in education and learning. Such an idea of balancing opposites to the "middle path", the complementarity of modern physics and Nicolescu Middle Included is suggested in the Tai Chi Diagram, the best-known symbol of Taoism.

In the Tai Chi symbol of the millennial Chinese philosophy of Taoism, the outer circle of the Yin Yang symbol represents the universe, the cycles of the earth, such as birth, childhood, maturity, and death or the transition from season to season. It also describes the circular and flowing movements found in Tai Chi, which mimic the meanings of the circle in the Yin Yang symbol. Tao means "conscious path", and Taoism is based on the philosophy of the interaction of opposites, between the principles of Yin and Yang, from feminine to masculine, which has analogies in modern physics. The duality Yin and Yang reflects, respectively, the polarities (a) low, feminine, gloomy and material opposed to (b) high, masculine, luminous and divine.

In Figure 4 it is suggested the rotation between Yin and Yang, counterclockwise (may also appear on time), making



**Figure 4:** Tai Chi symbol to evidence complete cycle of opposites in the quadrants clockwise (Source: author adaptation based on traditional Chinese medicine).

analogy with the rotation to complete the cycle. The graphic analogy in the Cartesian plane of Tai Chi can be presented as follows, by Uroboros in the alchemical tradition.

In the view of the psychiatrist, philosopher, theater director and Jungian therapist Bernardo Lynch de Gregório, when dealing in an interview about studies comcomparatod civilizations, communities, tribes and peoples who have never met, the types of archetypes are summarized in three dualities: (a) male and female, (b) light and shadow, (c) human and divine. The shadow is often related to evil in these cultures, and Jung would have developed the psychological idea of animus and anima, which reflects male and female duality in the sense of spirit and soul, respectively. In parallel Chinese Taoism comes with Yin and Yang duality, reflecting, respectively, the polarities (a) high, masculine, luminous and divine, as opposed to (b) low, feminine, gloomy and material. [15]

## 4 Alchemical Tradition

In our view, many think it's the alchemical tradition just a protoscience, a precursor to modern chemistry, but it's much more. This tradition arises in a context where there was no separation between the natural sciences, philosophy, psychology and religious traditions. In a way it encompasses all these aspects of human knowledge, in the form of symbols, allegories and images. Its principles may relate to Greek philosophy, but integrated into the empiricism of laboratory practices. This set of knowledge was deeply studied by Jung, who discovered a series of symbolic meaning with the human psyche and the unconscious, interesting for the interpretation of dreams. Thus, the alchemical tradition reveals a universal language, to be understood by the scholar in the form of symbols and metaphors. One of the main alchemical instruments are images bringing to consciousness unperceived contents in everyday life, which need to be expressed for the evolution of being in its psychological process, which Jung called individuation.

According to Hillman, Jung said that alchemical metaphors give us a better understanding of what the psyche goes through in a long and in-depth analysis. Alchemical tradition was necessary to provide a basis for Jung's deep psychology, as he abandoned literal unilateralism entirely. No term means only one thing. Every alchemical phenomenon is both material and psychological at the same time. It is then all metaphorical and symbolic. The soul asks to be worked as well as the material asks to be refined. The raw wants to be cooked, thus suggesting an archetypal basis for the ideas of perfection, progress, as well as evolution. In Addition,, the same author points out that the alchemical model suggests that it is the same as what is inside; both man and the world have souls, so. In addition, Hillman explains that the alchemical tradition offers psychological insights that cannot be achieved by a Cartesian-Newtonian science, which separates the worker from work. In this regard, quantum physics offers similar insights, only discovered in the early twentieth century, when it is attested that it is not possible to separate the observer from the observed object, that is, the subject is inseparable from the object. Hillman adds that the alchemists said "Throw away the books", meaning "discard the literal", in order to hear the spirit in the lyrics.[16]

As a rule, the alchemical tradition outlined a process of "chemical transformation", which could also be understood as the work (the alchemical opus). The opus, consequently, dictated the instructions for that process to be completed. However, the way he was routed and even described ranged from adept to adept. Each alchemist had his own language, and perhaps that is why his study is considered very complex to this day. According to Hall, alchemists did not clearly distinguish objective work on subjective work on themselves.[5]

For Crema, the alchemical opus represents a symbolic journey in the psychic universe from the raw stone of the ego towards the supreme goal of the elixir of life, the philosopher's stone of self. The alchemical tradition aims, at the same time, at the healing and liberation of the soul and the cosmos. In this sense it complements the Christ task of human salvation, also proposing a cosmic redemption. Also according to Crema, in Jung's view the alchemical tradition is the Western dream and, more particularly, of Christianity, constellation the aspects denied in it: matter, feminine and evil. Here is the second

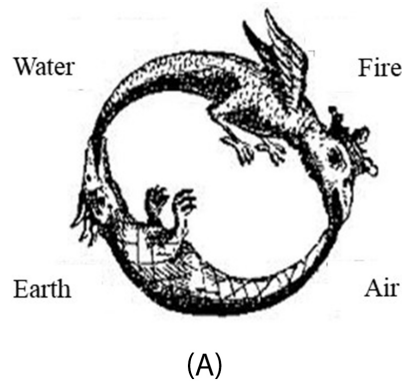


principle of the Emerald Tablet. Considering the four Jungian functions of sensation, feeling, thought and intuition, in Roberto Crema's reading the individual develops only one or two of them, and the others end up atrophied or undifferentiated. The development of the deficient functions and their integration and harmonization with the rest leads to a fifth function, which Jung calls Self, an intelligence of psychic totality, the central objective aimed at the process of individuation, an initial path that leads us from the egoic periphery to the altitudes and abysses of the wisdom of the Being.[17]

The four elements are principles of frequent reference also in the European alchemical tradition, which Jung studied in detail, before drawing his psychological theory, in view of the principles of earth, water, air and fire, as Franz explains:

The alchemist Zosimos (3rd century) already stressed that the four elements should not be understood in a concrete way; on the contrary, they would be mysterious "centers" or principles present in the matter. Later, they were interpreted as aggregations: all solid matter was considered as "earth", all liquids as "water", all gas as "air" and everything that burned, corroded or burned as "fire". [2]

In this context, Figure 5 shows the alchemical dualities and four element principles.



(A)



(B)

**Figure 5:** Alchemical dualities and four elements (Source: author adaptation from Franz [18] for comparative purposes: A) Symbol of Uroboros or Ouroboros, two creatures with and without wings biting their respective tails, analogous to the Tai Chi symbol – duality and four elements in the quadrants. B) Star of David as a duality symbol of i) the opposed triangles, corroborated by the ii) black small cross at the top, another symbol of duality (vertical versus horizontal axis opposed).

According to Franz understanding, explaining the meaning of Uroboros or Ouroboros:

Of course, the problem of the two birds is a variation of the Ouroboros as in the old alchemy, because in the ancient Greek texts they find a drawing of the snake that eats the tail. In general the head has stars and the rest is black, which would be the secret opposition. In the ancient Greek text this explains how the head is different from the tail. It's a wonderful image if we say it's one thing, but there's an opposition between the head and the tail. Hence there are sayings such as: "Take the head, but take care of the tail", or "Unless the head integrates the tail, the whole substance is nothing". It is very much what is said about the head and tail, and the way in which they must relate to each other, so that it describes well the opposites that are secretly one. It is a kind of European Tai Chi, as the symbol of the Yin-Yang, the opposites in one. [18] (p. 90 in Portuguese Issue).

Synthetically, many symbolic similarities are perceived between the Uroboros and the Tai chi diagram, as well as with the Star of David. All are ways of representing the need to interact and harmonize opposites. The figure of Ouroboros also



**Figure 6:** Emblem of the Theosophical Society (The Theosophical Society).

appears, very similarly, on the outside and circular of the symbol of the Theosophical Society in Figure 6, where the serpent bites its own tail, as follows.

In this emblem there are several interesting aspects in our vision. One can observe the Star of David, evidenced by the difference of the black triangle indicating the material world and the white indicating the spiritual world. Moreover, in the center one perceives a cross, another symbol of interaction of opposites (from horizontal to vertical). This cross with a different shape at the top symbolizes the Spirit immersed in Matter and crucified in it, but risen from death, so it is considered the "Cross of Life", the symbol of Immortality, an ancient Egyptian symbol, also known as *crux ansata*.

Thus, the ultimate goal of the alchemical tradition is to reach the philosopher's stone. Then comes the concept of quintessence, ether or fifth element, result of the interaction of the four - earth, water, air and fire. In our opinion, one of the European alchemical symbols, the Uroboros or Ouroboros are two birds or dragons biting each other's tail, with wings and without wings, a symbolic image of the European alchemical tradition for interaction and integration of opposites. The four principles earth, water, air and fire appear drawn at the vertices in the original spelling (highlighted by this author), with their respective triangular symbols to be joined in the star of David in the illustration below, an icon of interaction and integration, both of the opposites and of the four elements, according to the alchemical tradition, but also present in the Jewish tradition, including on the flag of the State of Israel.

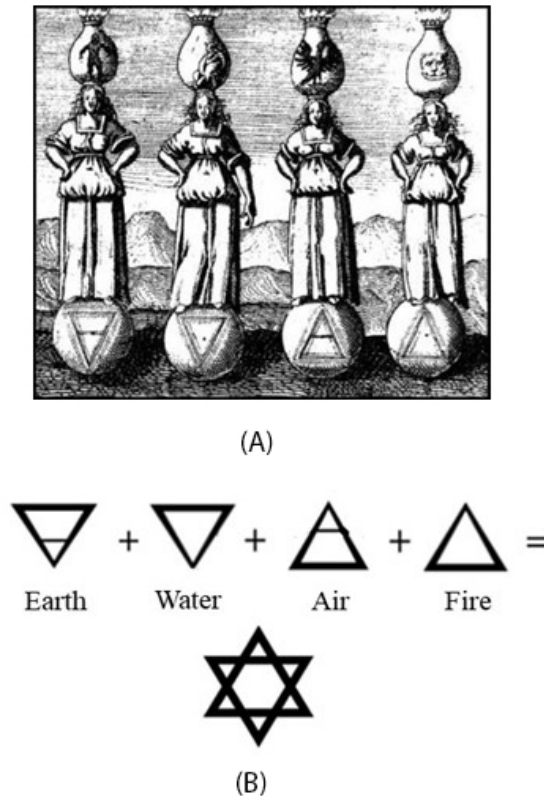
Figure 7 shows the symbols of earth, water, air and fire of the alchemical tradition as triangles of different shapes, in the illustration placed inside spheres. These four overlapping symbols form the star of David, the very frequent 6-pointed star of both the European alchemical tradition, as a symbol of integration and balance of the four elements and the "up and down" dualities. In the same Figure the operations are represented by the vials or vessels at the top, each with distinct contents. Hillman suggests a parallel between the psyche and the vials or glasses. Glass, like the psyche, is the means by which we see inside, we see through. It would be a physical representation of insight. Glass as a subtle body requires a subtlety of observation [16].

Edinger relates the ego to the image of a vase [19]. On the four operations, sublimation, for example, is represented by the eagle, in the vial related to the air element. Calcination, on the other hand, is illustrated by the lion, the lower sun, the egocentric impulse of power, a form of fire.[20]

The graphic overlap of the symbols of the four elements, that is, the triangles with or without cuts in the middle, shown in the spheres of Figure 7A, reveal the Star of David, as shown in Figure 7B, which besides being a symbol of duality also indicate two triangles whose vertices point up and down, and may also be a way to see the integration of these four elements, the quintessence, the ether, the fifth element.

As the most comprehensive example of all, Figure 8 below simultaneously reveals quaternary and duality elements, as we will review below.

**Some comments on Figure 8.** One of the possible readings of the Figure would be the interaction between the spiritual world or ideas (clearer, above) and the material of the world or the senses (darker, below). Observing as seven people sitting inside the earth or digging, he remembers the Myth of Plato's Cave, from the world of the senses: they can represent the seven energetic levels that manifest themselves on the physical plane as in the psychological counterpart, the seven chakras, which correspond to the seven nuclei of the rainbow and the seven musical notes, besides relating to various physiological and psychic elements. To see the harmonization, at a more subtle level, through the balance of opposites, between the man sitting with the red triangle up and the woman sitting with the blue triangle down. The balance appears in the form of a human being in the middle, sitting and holding the Star of David (the overlap of the triangle up and the triangle down). Emphasizing this interaction of opposites, the sun and moon appear at the top, at the lightest background, symbolizing the day, contrasting with the sun and the moon below, in the darkest background, representing the night. It should also be noted that the sun, a masculine principle, is on the left, on the man's side, and the moon, a feminine principle, on the woman's side. This figure can be interpreted as a Western mandala, as Jung would say, because there are four elements at the ends, suggesting a convergence to the center, represented by the Self, in the form of the human being who appears holding the Star of David with his right hand. As for these four elements, the water appears below on the right, and the earth, below on the left. The fire, high to the left, shows itself as a burning salamander. In Europe the salamander became a symbol of fire, because when burning firewood they appeared, usually hidden underneath, thus giving the impression of arising from the



**Figure 7:** The four stages of the alchemical process (Sources: elaboration of the author from A) of the figure: "The Four Stages of the Alchemical Process" MYLIUS, *Philosophia reformata* (1622) and B) scheme of the triangles of the figure, to reflect the alchemical tradition: four elements earth, water, air and fire, consolidated as one: the symbol of the star of David.).

flames. The air, high on the right, appears as human heads blowing the air, suggesting the rational part.

## 5 Jung Typology

Franz states that Jung developed a theory of psychological types, conceived more intuitively in myths and religious symbolism, in the model of a quadruple structure of the psyche, like in modern physics. [21]. The Jungian typology considers, in this context, eight possible combinations based on the predominance of a given function of the psyche with the focus in introversion, in the subject - internal part, or extroversion, in the object – external part: sensitive, sentimental, thoughtful and intuitive (introverted or extroverted). Tabel 3 synthesizes this classification, with examples of each type.

As in every classification, his scheme of typologies is merely a kind of orientation, just an instrument to practical psychology, to give some explanations, because there are no pure types at one extreme or at the other of the polarities. In this classification there are three dualities:

- a) extroversion and introversion;
- b) sensation and intuition;
- c) thinking and feeling.

## 6 Initial Insight Flirting with Technoscience – January 2012

Our book released in 2020 deals with transdisciplinarity applied to public administration, but its universal basis began to be constructed in early 2012, when an image came to me as an initial idea, similar to the x and y axes intersecting in a Cartesian



**Figure 8:** Other alchemical example of duality and four elements (Source: Aureus tractatus de philosophorum lapide. Musaeum Hermeticum, 1625).

**Table 3:** The eight Jungian psychological types (Source: scheme prepared by this author [22] based on Franz [21]).

Dominance of function	Complementary focuses:	
	Extroverted or Introverted	Psychological profile
	Object or subject	
	External or internal	
Sensitive	Extroverted	Cold engineer, experimenter, empiric
	Introverted	Painter (artist) detailing well his colors
Sentimental	Extroverted	Reasonable, friendly, soften the environment, supportive. They like ready proverbs, so as not to think. They tend to fanaticism.
	Introverted	They are often the ethical basis of a group.
Thoughtful	Extroverted	Organizers, they may hold high level government positions. They have a sentimental connection with ideals.
	Introverted	Theorists, full of ideas
Intuitive	Extroverted	Major investors, entrepreneurs and politicians.
	Introverted	Religious prophet, seer type, like a shaman, or even other types of visionaries and innovators.

plane, like a cross. It was an insight, actually. This image initially showed the interaction of horizontal and vertical opposites through the cross, with much more:

- a) The four functions of the psyche – sensation, feeling, thinking and intuition.
- b) The four states of matter – solid, liquid, gas and plasma.
- c) as a result, the duality psyche and matter (soma) – psychosomatics.
- d) the four epistemic ways – philosophy, tradition, art and technoscience.

Only after some years I could understand the result of this initial insight: transdisciplinarity (TD) at the center of the scheme (see Figure 10).

Figure 10 shows our initial insight, as a representation of duality and the four elements, through the four physical states of matter, analogous to the four psychological functions. Interestingly, in 2020 this author discovered Jung's 1957 interview with Dr. Richard Evans, in which he claimed that the psyche is another aspect of matter [8]. Psychosomatics corroborates this view of complementarity between the physical and psychological dimensions. Figure 10 thus presents four dualities:

- i) physical and psychological by the corresponding four states of matter with Jungian functions;
- ii) judgment and perception regarding the psychological dimension of the horizontal and vertical axes, respectively, which form a cross;
- iii) thinking and feeling on the horizontal axis;
- iv) feeling and intuition on the vertical axis

There is also the subject and object duality, observed both in modern physics (observer and experiment) and in Jungian psychology (introversion and extroversion), but this complementarity appears only in Figure 9, as OBJECT that is outside the circle to involve the cross and SUBJECT to what is inside.

According to Capra there are deductive scientific methods, represented by René Descartes, or inductive, represented by Francis Bacon.[23]

In our perception deductive reasoning is based on theory, typical of ancient Greeks, while inductive, based on experimentation, as in Ancient Rome. The Romans were very pragmatic, great directors of engineering works and forerunners of law. However, when they needed scientists and inventors, they turned to the Greeks, who had the gift of mathematics, of deductive reasoning. There are, therefore, these two complementary forms, which can and should be used to close a framework of thought. In the history of philosophy there were Rationalists (such as Descartes, Leibniz and Kant) and Empiricists (such as Locke, Berkeley and Hume. [24].

By the way, according to Hillman, the empiric John Locke claimed that all knowledge was acquired through the senses and understood that nature can only be known by direct experience. [16]

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## 7 The Four Disciplines as a Management Instrument

Weil, D'Ambrosio and Crema consider that there are four main disciplines applied to transdisciplinarity: science, philosophy, religion and art. Advisable to remember that technoscience is the result of interaction of **technology** and **science**, sometimes it is difficult to separate one from the other. Also, tradition can be a broader approach to religion [25]. So, the four epistemic ways or the four disciplines can be considered as:

### I. Philosophy, II. Tradition, III Art and IV. Technoscience

One relevant question regarding transdisciplinarity can be translated through Jung's point of view: causality (linear logic) is the Western way. and synchronicity the Oriental way – the meaning in first place [26]. In this aspect, transdisciplinarity could be the **dialog between causality and synchronicity**. The basis of transdisciplinarity can be considered as the **interaction and integration of opposites, dialectics** – episteme or noesis.[12]

In 2005 Max-Neef said that we have reached the point in our evolution as human beings where we know a lot, but we understand very little. [27]. So, Max-Neef considers that transdisciplinarity is connected to comprehension, something broader than the mere knowledge, that does not necessarily select the relevant information for problem solving, in economics, for instance, Max-Neef discipline as ex-professor of Berkeley.

Table 4 shows transdisciplinarity as TD in the quadrant IV, at the centre of the cross.

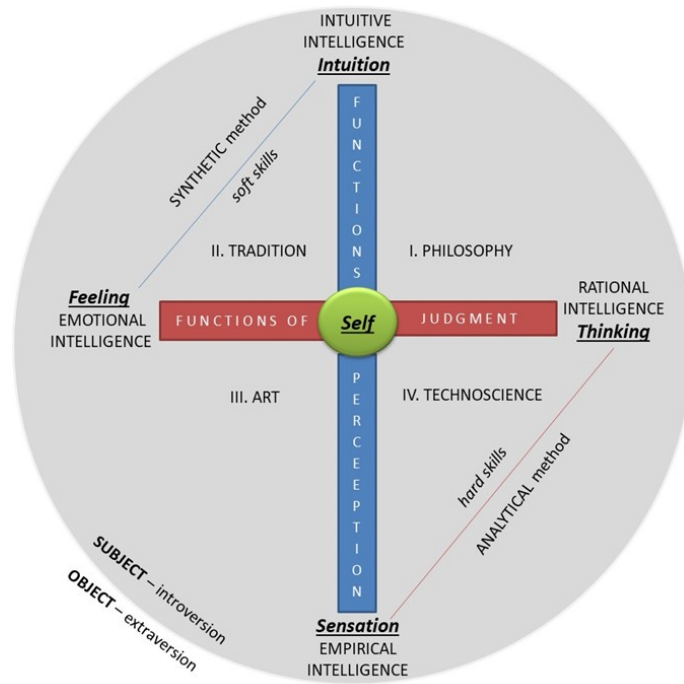


Figure 9: Costa perspective of individual psyche and Jung celtic cross drawing at the Red Book (Source: adapted from COSTA [22]).

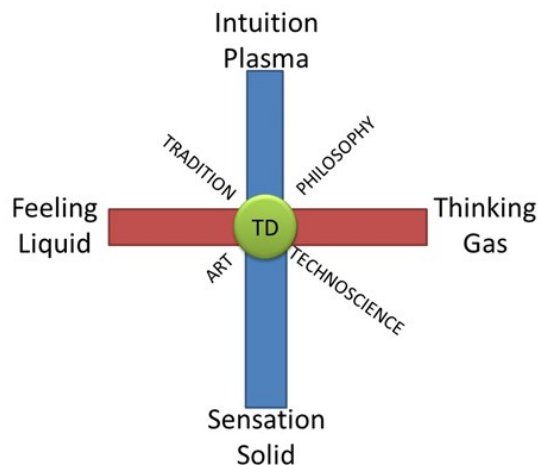

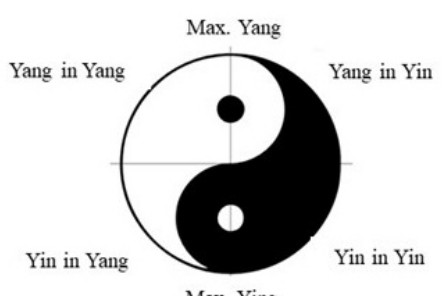

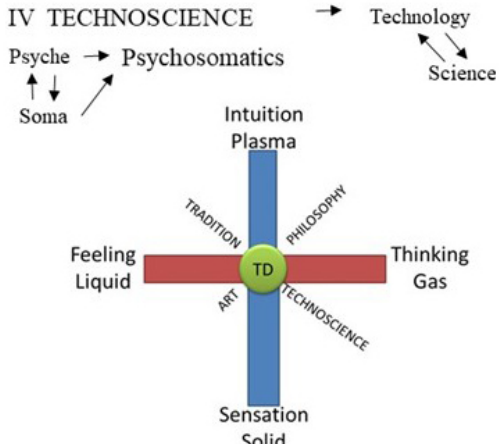


Figure 10: Complete insight at the beginning of 2012 (Source: adapted from COSTA [22]).



**Table 4:** The four applied epistemic ways (Source: adapted and improved from Costa original version [22])

	Subjctive feeling	Objetive thinking
Abstract intuition	 <p>TRADITION II</p>	 <p>I PHILOSOPHY</p>
Concrete sensation	<p>Amphitheater</p>  <p>ART III</p>	<p>IV TECHNOSCIENCE</p>  <p>Psychosomatics → Technology / Science</p> <p>Intuition Plasma</p> <p>Feeling Liquid</p> <p>Thinking Gas</p> <p>Sensation Solid</p> <p>TRADITION</p> <p>PHILOSOPHY</p> <p>ART</p> <p>TECHNOSCIENCE</p> <p>TD</p>

The four epistemic ways can be related to Jungian functions, considering: **I. philosophy** (thinking + intuition), **II. tradition** (intuition + feeling), **III. art** (feeling + sensation) and **IV. technoscience** (sensation + thinking). These correlation between Jungian functions **thinking, feeling, intuition** and **sensation** with the quadrants I to IV this author had understood initially by himself, as shown in the cross of the quadrant IV, but then found the same approach in Weil, D’Ambrosio and Crema, unfortunately only available in Portuguese. For those authors, obviously these connections are relative, because art has intuitive aspects, religion has developed rational foundations, and science itself often initiates its theories on an intuitive level. Besides, they connect to transdisciplinarity the holistic vision, including hology (the study of the whole) and holopraxis (the praxis of the whole). This paradigm is known as “holistic transdisciplinarity” [25].

Finally, the origin of the correlation between **objective, subjective, concrete** and **abstract** with quadrants I to IV in Table 4 comes from the MBTI system. [13]

The cross represents the interaction and integration between the horizontal and the vertical, judgment and perception in terms of psychological functions, but there can be interpretations. Psychosomatics implies physical and psychological parts functioning as a whole. The four states of matter compared to the four Jungian functions are only one of the possible ways to show psyche functions as a quality of matter, considering the physics states of matter: solid, liquid, gas and plasma, if considered the 1957 Jung’s interview. [8]

Finally, the four disciplines are shown graphically as a part of TD in the center of the cross. Besides the interaction and unification of the four epistemic ways, TD can be also considered the balance and eventual integration of the four functions, as well as of the horizontal judgment and vertical perception.

In our opinion, with the development of science from the eighteenth century, since the Modern Age the Western view of reality has become fragmented by experts focused on the paradigm of causality, in which everything is rationally summarized to direct relations of cause and effect. It is seen that this does not work entirely for human phenomena, as Nicolescu puts it. If someone seeks to promote this reductionist paradigm for any kind of description of reality, caution is needed, because it may be:

- a) simplistic, unsuspecting or unconsciously co-opted; or
- b) conscious or unconscious manipulators, using arguments
- b1) of "science",
- b2) of the "technique" supposedly only known by the specialists, as well as
- b3) absolute "truth", dogmatic, axiomatic, polarized, without dialogue and without recognition of the coexistence of opposites (after all, without ethics).

The pre-Socratic philosopher Heraclitus (535-475 a.C.) considers that the balance of opposites leads to the unity of the universe, everything is in the process of change and the cycle of transformations takes place up and down [24], even reflecting an age-old hermetic principle, which leads to the idea of spiraling consciousness development, according to Jung [16]. This also resembles the philosopher character in Plato's cave myth, who leaves the cave and then returns to tell his fellow prisoners what he saw [11].

Finally, this is the dialectics meaning, the friction between opposites and the oscillation between them is for the learning process. Polarization tends to crystallize and interrupt this evolutionary process through dogmatic "truths", even in science, which can be an instrument of power, manipulation or domination, either consciously or unconsciously, in view of subliminal communication, advertising and marketing techniques.

## 8 Duality and Four Elements for Problem Solutions

To illustrate in praxis the need for dialogue or dialectics, the Figure 11 scheme was constructed for reflection on how to deal with problem solutions, when they involve human phenomena, in terms of dualities or polarities and four elements: sense, reasonableness, feasibility and rationality. This model is a result of our conception and developed based on Jung's psychological typology and in the MBTI, which improved the Jungian classification. The four requirements can be correlated to the psychological functions developed by Jung types, which is the basis of the MBTI system: dominance of intuition, feeling, sensation or thinking.

Anthropologist and psychologist Roberto Crema, rector of UNIPAZ in Brazil, teaches that Jungian functions of feeling and intuition make up the synthetic method, while those of sensation and thinking underlie the analytical method. He considers that we can summarize the synthetic method as a necessary and creative response to the fragmentation crisis based, paradigmatically, in a science detached from consciousness, which led the subject to degenerate into an object. This method is the basis of the generalist. It is a qualitative pathway that is opposed to the quantitative and merely objective approach of the specialist. The four intelligences can also be considered, respectively: intuitive, emotional, sensitive (empirical in our classification) and rational.[17]

Besides, Figure 12 shows this author's vision of transdisciplinarity, which can be as simple as the A) dialogue of opposites, interaction of dualities or dialectics and B) the integration and balance of the four archetypical<sup>4</sup> elements or principles:

- B1) In ancient traditions – earth, water, air and fire (the alchemical four elements).
- B2) In physics – solid, liquid, gas and plasma (the states of matter).
- B3) In psychology – sensation, feeling, thinking and intuition (the conscience functions).

Considering that psychology was separated from philosophy as a discipline only in the end of 19th century; even in Plato philosophy these four elements are present, and can be shown in the same sequence of B1 to B3 approaches in the divided line A, B, C and D [12] evidenced in The Republic [11]:

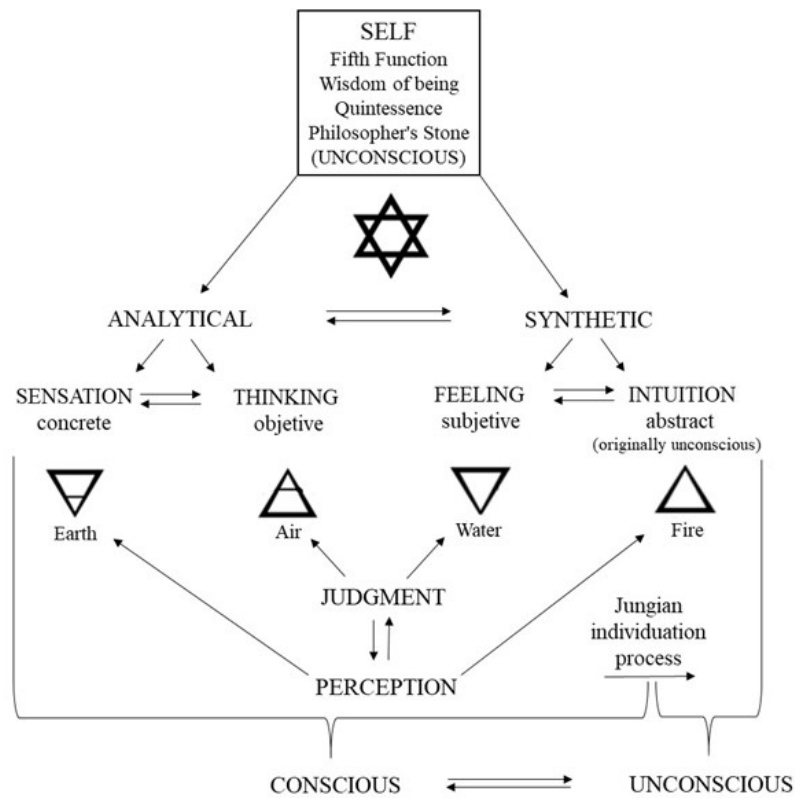
- A - Eikasia – sensible appearances (perceiving).
- B - Pistis – common sense (belief).
- C - Dianoia – thinking (like in math).
- D - Noesis – intelligence or intuition (dialectics).

The connection with Jungian functions sounds clear: A- sensation, B- feeling, C thinking and D- intuition.

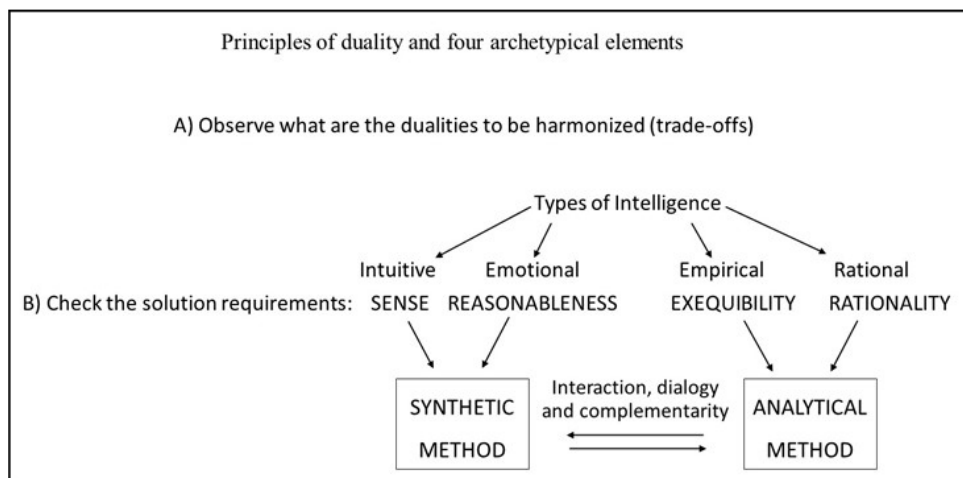
Those four elements tend to be shown in archetypical form, that is how came the idea of requirements of feasibility, reasonableness, rationality and meaning, as an insight. It is a conjunction of physics, psychology, philosophy and management in search for the best diagnosis for sustainable solutions, considered the ones balanced in terms of the various actors and disciplines involved in public management.

These concepts can give some clues about those focused on rational intelligence, often without taking into consideration the reasonableness, feasibility and meaning in the broader context of certain proposed solutions. Therefore, soft skills, related to emotional and intuitive intelligence, have been treated as something less important in our Western culture.

<sup>4</sup>Archetypes are universal images or patterns, culture-independent models or scripts. The initial concept comes from Plato, but Jung explored the idea in his theory of the collective unconscious.



**Figure 11:** Quaternary structure of Jungian functions together with the alchemical tradition (Source: adapted from author’s own book [22]).



**Figure 12:** Duality and four elements as troubleshooting requirements (Source: adapted from author’s own book [22]).

Considering the **synthetic method**, including symbology (soft skills), the history of Abraham in The Old Testament can be significant. According to Professor Jordan Peterson,<sup>5</sup> the individuation process involves: i) integration of feeling and thinking in one direction; ii) to turn abstract (intuition) ideas into actions concretely (sensation); and iii) to integrate subject with object. The worst sin is not to commit mistakes, but not to try. The Abraham covenant is the best solution you have at hand, to go up and down constantly, in the journey of the hero upwards. Professor Peterson tells the story of Abraham, who heeds the call of God to leave what was familiar behind and to journey into unknown lands. The man portrayed in the Bible as the father of nations moves forward into the world. He encounters the worst of nature (famine), society (the tyranny of Egypt) and the envy of the powerful, who desire his wife. There is nothing easy about Abraham's life. Instead, he is portrayed both as a real man, with serious problems, and a hero, who overcomes tremendous obstacles to establish himself in the world.[28]

Individuation, as mentioned by Peterson, is a Jungian terminology, the process where someone develops out of an undifferentiated unconscious – seen as a developmental psychological process of integration over time into a well-functioning whole. It is different from individualization, because it considers not only the subject (internal environment), but also the integration of the object (external environment).

Furthermore, in view of the analytical method, one can understand separately the four Jungian conscientious functions, connected with the four elements, as follows:

1. Thinking with RATIONALITY – that is, the mechanistic and Cartesian view typical of economists and mathematicians.
2. Feeling with REASONABLENESS – reasonableness is a principle widely used in Law to assess whether something is acceptable or not, it is a function of judgment complementary to rational thinking.
3. Sensation with FEASIBILITY – many engineers and administrators tend to solve problems in a concrete way, not necessarily rationally understanding how the best solution works, the focus is empirical.
4. Intuition with MEANING – it is the sense that entrepreneurs, managers, police investigators, politicians, religious leaders and alike seek in certain solutions, envisioning the processes in a broader aspect, especially when there are no complementary rational and empirical arguments to help in diagnosis. It may even overcome RATIONALITY if the perception of meaning is too strong.

## 9 Conclusions

Understanding the psychological types helps to achieve the best of each one, due to their innate strengths and capacities, so that a synergy of results can be created within the relationships. The MBTI serves both i) for self-knowledge, to make his own self-management on a day-to-day life, and ii) to understand how other people work psychologically, so that a synergy can be created in the process of relationships. The applied transdisciplinary approach is based on the principles of i) duality – interaction and integration of opposites, specially the analytical and synthetic methods and ii) four elements - rationality, feasibility, reasonableness and meaning. However, it is not a simplistic or a magical-vitalistic approach as it may seem to rationalists at first, as far as modern physics is concerned. The holistic view of reality, including holology (the study of the whole) and holopraxis (the praxis of the whole) can't be confused with political ideology, something that happens very frequently to scientists, who consider themselves "exempt" and "impartial".

Finally, the core idea of this article is to promote transformation of the culture and personal behavior, connected to reasonableness and meaning, emotional and intuitive intelligences, mainly because of psychological sustainability and mental health.

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## About the Author



**Leonardo Martins da Costa** is a public servant from the Brazilian Treasury inside the Economy Ministry – federal auditor of finance and control since 2009. MBA in corporate management (2002). Post-graduated in engineering economics (1996). Civil engineer with emphasis in sanitary engineering (1992). Since 2011 has been studying applied transdisciplinarity, in connection to physics, economics, law, psychology and politics. Considering his background as an entrepreneur and manager in urban developments and international trading, respectively, from 1993 to 2009, before going to the public service, the author was able to have published three works on federal funds in a managerial approach (2011, 2012 and 2017). With this background he wrote a book in 2020 on transdisciplinarity connected to public expenditure and public administration. Finally, the author is always keen to participate in discussions connected to applied transdisciplinarity.