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Methodology

and

TRANSDISCIPLINARITY

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Presentation

Scientific knowledge results from a cognitive process mounted on methodology, metaphysics and the theory of values. Methodology, using resources of logic and epistemology; metaphysics objectifying ontology and cosmology, and finally the theory of values integrating ethics and esthetics enable the weaving of the threads into the magic carpet human beings intend in order to arrive at what is called *knowledge.*

Backed by science within a transdisciplinary approach, the delimitation and ordering of thoughts is materialized fundamentally by three beliefs called the transdisciplinarity postulates, namely, *complexity,* the *levels of reality* and the *participation of the other.* In writings about transdisciplinarity, some call *the other* an indefinite *third,* which may or may not be included, or excluded in expressing the relationship.

The contours drawn by the *levels of reality* where the disciplines are applied compel us not only with the need to recognize them as *objects,* but also to adopt appropriate methodology and *language*. The forms of communication codified in signs and symbols are recognized in the generic indicator as *language.* Language, therefore, is the oratory code through which thoughts and ways of thinking are articulated and classified. All language is based on referential parameters. In other words, the disciplines can be identified through parameters that lend support to their own specific jargon.

Distinct thoughts and ways of thinking, though contrary or contradictory, incompatible or incongruent can coexist even if codified by means of diverse processes. For what we call knowledge, however, it is necessary and essential that these incongruencies and fundamental opposites do not occur at the same level of reality; or better, that the contradictions do not occur at the same time within the same system of thought, for to admit that incoherent and contradictory thoughts are true simultaneously is to deny the paradigms of the truth or falseness with which they are concerned.

Three postulates of transdisciplinary method that contribute to advancing knowledge have been addressed: a) the *complexity* of the phenomena; b) the *levels of reality* at which thoughts occur and c) the existence of the *other,* whether guardedly or expressly included, or not in the cognitive formulations.

It is important in this presentation to clarify the intrinsic meanings in such presuppositions.

I - First postulate: complexity

The experience, whether scientific as is each of our lives, teaches that it is impossible to completely isolate one phenomenon from the others. Even with the greatest precision and rigor with which laboratory procedures are performed, the observer sees himself obliged to appeal to imaginary limits in order to isolate the phenomena under observation detaching it from all other contextual instances by using hypothetical fiction,

In so far as all phenomena are dependent and interlinked, one must admit that *nothing is simple,* but quite the contrary, that *everything is complex.* There are no isolated phenomena; nothing is singular in the world in which our perceptive forms function. All the phenomena, including all living beings, are interlinked and are interdependent. This leads us to believe that *complexity* is an assumption for the knowledge we intend to acquire.

In the Universe, the fragments of the all continue to be part of the all, as tiny as they may be. Deprived of any of its fragments, the Universe would no longer be *universe,* but a quasi-universe. Thoughts are always abstract thoughts of the Universe. They occur within the All; their references integrate the all, and to it remain connected.

For such observances, we adopt, as a true and justified belief, that *all phenomena, of whatever nature, including thoughts, are complex and nothing happens alone or independently from all that exists in the Universe.* This is the first postulate of transdisciplinary methodology.

II – Second postulate: level of reality for knowledge and communication

The observation of the processes and methods that lead us to knowledge and for this reason become propitious to communication, show that the varied available resources originate, and subsequently are processed and externalized from distinct observable points. Such resources follow pre-existing language and concept parameters.

Each person, from their observations, reads the phenomenon differently from another resulting from personal subjective and objective reasons insofar as they come from distinct presuppositions. In view of this verification, we are led to recognize the *state of consciousness,* which is intellective by nature and the signals with subjective and objective perceptions.

These markers, when differentiated, make it possible to read several distinct results and to consider them valid and efficient even though the forms of perception may indicate incompatibilities and incongruencies. When this happens, the solution for resolving the difficulties in this state of consciousness requires an artifice like that used for calculating, or a simple perceptive resource to identify and locate the contradiction at the different *levels of reality.* With this approach, the antagonisms can be overcome through use of the diverse forms of perception at each *level of reality.*

The chronology of the transdisciplinarity documents began with the Declaration of Venice, dated March 07, 1986, to which Brazilian mathematician, Ubiratan D'Ambrósio contributed and helped to elaborate. Items 3 & 4 of the Final Communiqué originated from the colloquium on *Science and Tradition: transdisciplinary perspectives for the XXI century* held in Paris from December 2-6, 1991, organized by UNESCO. They are part of the conclusions of seven items formulated by the editorial committee comprised of René Berger, Michel Cazenave, Roberto Juarroz, Lima de Freitas e Basarab Nicolescu, and say the following:

> *3. Paradoxically, one of the conceptual revolutions of this century (XX) came from science, and particularly from quantum physics bursting the old view of reality with its classic concepts of continuity, locality and determinism still predominant in contemporary political and economic thought. It gave birth to a new logic corresponding in many aspects*[T.N.]*- the old logic forgotten. A capital dialogue evermore rigorous and profound between science and tradition can now be established to construct a new scientific approach: the transdisciplinary approach.*
>
> *4. Transdisciplinarity does not seek to construct any syncretism between science and tradition: modern science's methodology is radically different from traditional practices. Transdisciplinarity pursues points of views from whichever enables science and tradition to interact. It seeks to find intellectual space that will take it out of its unit while respecting the differences, especially those supported by a new concept of nature.*

In the Transdisciplinarity Charter, struck at the First World Transdisciplinarity Congress, held at the Arrábida Convent, Portugal, November 2 - 6, 1994, article 2 reads:

> *The recognition of the existence of different levels of reality governed by different types of logic is inherent in the transdisciplinary attitude. Any attempt to reduce reality to a single level governed by a single logic does not lie within the scope of transdisciplinarity.*

And in Article 14:

[T.N.] Of the many conferences sponsored by UNESCO the Declaration of Venice emerged from the symposium "Science before the Boundaries of Knowledge", organized with the Georgio Cino Foundation in 1986. "Science and Culture for the 21st Century was the name given to the Vancouver symposium held in 1989.

> *Rigor, openness and tolerance are fundamental characteristics of the transdisciplinary attitude and vision. Rigor in argument embracing all existing data is the best defense against possible distortions. Openness involves an acceptance of the unknown, the unexpected and the unforeseeable. Tolerance implies acknowledging the right to ideas and truths contrary to our own.*

At these diverse *levels of realit*y the perceptive, exteriorizing and communicative forms of thought require paradigms with distinct natures to enable them to measure intelligibility.

Acknowledging that *different levels of realities* process the thoughts and worth of experiences constitutes the second presupposition of transdisciplinary methodology. Our studies lead us to believe that there are at least eight *levels of reality* in which humans think and consciously act. That is, what we call *conscious states* occur at these different levels with a particular state of consciousness corresponding to each level. We identify as levels of reality those in which methods for apprehending knowledge are exercised. That's why *mysticism, authoritarianism*, *rationalism*, *empiricism*, *pragmatism, skepticism*, *amorousness* and *intuitionism* can be considered simultaneous paths that lead us to knowing while coexisting at the same *level of reality* at which knowledge is processed. We call *state of consciousness* the period during which, in the personal physical and mental context, knowledge occurs.

Mysticism

Observation corroborates the affirmative that, we all have mystic and mythological roots. When these roots are not personal we are able to identify them by their origin in the collectivity in which we live, or to which we belong. They are formed by mediation of use, customs and prevailing traditions in the social context in which we are, or were rooted. Each one of us accepts and incorporates as substantiated and true, certain historical narratives of mystical and mythological character referring to the origins of the universe, the world, the planet, and of ourselves.

In judgments that come to us from rationalism and empiricism, there subsist irresolute doubts and pertinent query as to the origins and causes for existing, whether of individual, or of universal nature. Accordingly, in a *state of consciousness* we want information that exceeds the levels of empirical and rational reality. An intellective anguish, by nature intimate and personal, leads us to perceive the existence of a *mystic level of reality* integrated by spaces of diffused images formed by movements of shadows and mist. It is usual to perceive this as much by the emphatic denial of the incredulous, as by the credulous affirmation of those who consciously adopt mysticism as a reason for living.

In view of these premises, it is easy to understand the reason behind the assertion in article 9 quoted from the same Transdisciplinarity Charter cited above:

> *... Transdisciplinarity leads to an open attitude towards myths and religions, and also toward those who respect in a transdisciplinary spirit.,*

We observe a *level of mystic reality* in which we are all ensconced when we go to church, to religious meetings, or to gatherings of mystic or mythical nature. It is also possible to note that the effort made by clergymen and pastors who seek to retain their followers at this level of reality, not only use mystic arguments and mystics with origins in its use, customs and traditions, but also use rational, sentimental and emotional propositions.

Authoritarianism

However skeptical we may be, we always let ourselves be convinced, through acceptance and appropriation, of beliefs adopted by someone else as being true and justified. Accordingly, we receive and adopt as our own truths, the thoughts and ways of thinking that, in fact, integrate another's reality. This supposed *true knowledge* is, or was formulated by others to whom we

give credit by attributing them with intellectual, moral and mystical authority. Furthermore, because we believe in these people, we accept their affirmations as truths. Acceptance, therefore, stems from the subjectivity and the credibility we lend to the human source from whom the information originates. This method of acquiring knowledge, called authoritarianism, assumes the characteristic of a *level of reality* imported subjectively, which we claim and by which we form our own judgments, reap opinions and garner values.

There are thinkers who affirm that around ninety percent of what we think we know actually has roots in information which takes its source from authoritarianism. It is at this *level of reality* that we adopt as true, information inherited from our parents, received from our teachers or gleaned from third parties in whom we trust. The *level of reality* called *authoritarianism* is formed by alien experiences and beliefs through the translating of what *others* establish, and whether through personal conviction or convenience, becomes easy and advantageous to espouse as a truth.

Thus, for example, we accept as truth, neither questioning nor delving into rational or empirical verification that the theory of relativity corresponds to a scientific truth. After all, it has been confirmed by innumerous authorities in the field of physics, and also derives from the intellectual authority we attribute to Albert Einstein. Furthermore, we take our children to be vaccinated against poliomyelitis based on the *scientific authority* we credit our scientists and the authority we attribute to the information published in the newspapers and ads when they affirm that a vaccine is effective and has no side effects.

Rationalism.

There is a level of *rational reality,* by nature abstract, which is not only identified in algebraic and geometric expressions, but is also in linguistic formulations. It becomes perceptible in expressions, judgments and ordination of thoughts and ways of thinking.

The *level of reality in which reason* seeks to harmonize, identify or signal what appears to be real and true uses symbolism, the mode shown to be the most readily accessible to the getting and projecting of ideas. Processed in this symbolic context, is communication by mathematicians, physicists and other scientists, be they active in empirical fields or simply in theoretical ones, as are also the conveyance of mystic and religious teachings. The essential requirement of rationalism in mental processing demands the compatibility, congruency and verifiability of conclusions in relation to their premises and those between them.

Empiricism

The codification of presuppositions, where the tower of knowledge is seated, the one we call corpuscular physics, when applied in another scenario such as quantum physics renders it necessary to establish whether or not the same scientific language used in corpuscular physics can be adjusted to the communication needs imposed by quantum physics. This occurs because the conceptual presuppositions that rule the relationships between the thought forms of these disciplines have shown themselves to be empirical and rationally incongruent. This means that saying that what is observed by one empirically as the materialization of bodies, to the other is only a probability of existence.

Hence, we can observe an *empirical reality* that comes through our senses of taste, touch, smell, sight and hearing, conditioned by forms of perception such as the auditory, which sensitizes us by the sound uttered, or is articulated through sounds and noises. One also observes other *empirical realities* such as those expressed in body language, in the art forms of

communication, those perceived through the intermediation in the culinary arts and in so many others that we learn to decode throughout our lifetime.

We can ascertain that the existing codes in the different scientific languages lose their value and effectiveness when they are incoherent, contradictory and controversial when they are considered at the same *level of reality.* Experience teaches that a sole scientific language is not always best for communication when used within different levels of reality.

Up to now we have spoken of transdisciplinarity as a method of approach that, related to interdisciplinarity and to multidisciplinarity, is multidimensional and does not exclude a trans-historical horizon. Transdisciplinarity endeavors to open all the disciplines to paths of knowledge that transverse and transcend them. And it does this by evoking not only *mysticism*, *authoritarianism, rationalism, empiricism,* but also *pragmatism*, *skepticism*, *amorousness* and *intuitionism*.

Pragmatism.

Pragmatism and *practicability* are not the same thing. Pragmatism, also called practicalism, sees the usefulness of things. Practicism, one of the manifestations of pragmatism, above all, holds in view the *ease and speed to which actions may be reverted.*

Montague signals that:

> *... The pragmatic principle is implicit in the statement that the truth of a theory depends on the practical validity of its consequences. Therefore, if in this statement the word* "consequence*" is highlighted, pragmatism becomes a general tendency or attitude and so widely disseminated that we end up studying it as futurism; but if we emphasize the word* practical, *its color and character change because it is designated as practicalism. And, being thus, more specifically applies to the problems of logical methods.*[1].

A more polished approach leads us to understand that modern *pragmatism* is guided by the same anthropocentric beacon that has directed humanistic thinking since the XII century. In fact, to the extent that we seek to attribute practical validity to knowledge seeking to better adapt ourselves to respond to future situations, we are moved by the idea that the future is created by us and for us. Therefore, the reasons so many understand *pragmatism* as *futurism.*

Skepticism.

The philosophical content paramount to *skepticism is the possibility for knowledge* that comes imbedded within the limitations of the human mind and results in the subject's inaccessibility to the object of knowledge. *Certainty* and *skepticism* oppose one another because of the a) confusions of language; b) different meanings attached to the same words; c) different levels of reality in which the phenomena and thoughts processed are focused d) ambiguities in the conceptual field.

The criticism to skepticism is that by adopting the principle of systematic doubt as certain, the skeptic behaves as though the truth contained in the doubt itself were an irrefutable dogma, and for this reason, incurs in the same error as the dogmatists.

Moral skepticism sustains: a) that moral principles cannot be proved; b) that there are no moral truths; c) that morality has no rational base and d) right or wrong is a question of preference or convention.

As one can see, *skepticism* is a *level of reality* in which shocks of ideals become evident when one intends to fit them into thought forms processed at other levels of existence.

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[1] MONTAGUE, William Pepperell. *Los caminos del conocimiento*. Buenos Aires: Sudamericana, 1944, p.113.

In approaching transdisciplinarity, one must consider that the empirical sciences depend on two essential approaches, namely: *a) empirical nature* dictated by common sense objectively when adopted to alien singular or collective experiences becomes recognizable by usual forms of communication; and b) *perceptive nature* when that which results from observations becomes the researcher's own, incorporated into his/her own personal and subjective experience, manifesting in his/her attempts to communicate and transform the results into *objective communication* assimilated by others.

Skepticism serves approaches of experimental nature that not only occur through intermediation of the intellective capacity of the collective (*common sense),* but also through the subjective neurophysiologic perceptions of the observer (*personal sense*).

Amorousness

When we treat relations of *love* garbed in the meaning contained in the word *amorousness,* we do not exclude the *common sense* indicated by sex, nor do we confine ourselves to the understanding that sexuality is the essence of love or of amorous gesture.

The Christians affirm that *God is Love.* In Latin, the word is linked to the meaning of c*upid,* which as a noun translates into *desire, wanting, appetite, passion.* Mystically and mythologically speaking, Love initially denotes a divinity.

In social relations, *mystic love* unveils as *vocation* or as *a response to divine calling,* expressed in devotion of the human being to the chosen deity. It is the generating force of the cult that externalizes the feeling of adoration.

In biology, love manifests as a force. It acts on live beings determining the special attraction of one being to another. When between beings of different sexes, it generally manifests itself with the reproductive force component called the *survival of the species instinct.* It is said that *amorousness* is the behavior which reveals respect, zealousness, care, attention and lovingness.

It does not seem possible to arrive at a conceptual content, nor at the practices of knowledge without including the idea of *amorousness* in the approach*,* and even more so, *love of another.* Love is, truly of vectorial magnitude defined by intensity, direction, meaning, application and temporality point without excluding the possibility of adding other characteristics.

Within the methods that can propitiate knowledge, amorousness is the most pleasurable, efficient and productive. It resolves problems, dissipates doubts, is creative and skillful, and seeks to induce processes, systems and solutions that render the human assimilative capacity efficient and productive, harmonious and pleasing whether to the spirit as to the soul and body. A*morousness,* when comprehended as a method that identifies a *level of reality* in which certain *conscious states* are manifested, signals with the transcendent power that the human mind conquers over limited meanings, and what we suppose is structured knowledge is *uni*, *inter*, *multi* or *pluri-disciplinary*.

Without love, there is no creed to connect the subject to the integrating elements of a supposed objective truth. Without a creed, no justification is possible. Hence, intellectual experience shows that without *amorousness* there isn't the slightest possibility of practicing transdisciplinarity. Moreover, without *transdisciplinarity,* scientific knowledge defined as a *true and justified* creed becomes a mere *fictional hypothesis.* .

Induced by the mysticism by which we are possessed, we assume the belief and accept as *intuitive truth* that there is a level of reality in which *love* is the *supreme force* that induces to

encountering knowledge. At this point we become cognizant of the meaning of the expression *God is love.*

Intuition

For five thousand years the Bonist monks, followers of the Bon Po religion, the oldest in Tibet, have studied the phenomenon they call *Dzoghen*, which we understand as *intuition.* In *intuitionism,* they recognized an efficient method for *revealing* knowledge. In *common sense,* the lexicon conveys the idea that we intuit what is made conscious through the intermediation of the internal forms of perception, regardless of all a priori knowledge, rational activity or personal experience.

In view of intuition, logical or empirical reasons lay open, for it is proper of *intuitionism* to emerge distanced from the claws that bind us to verbalized thoughts. What we designate as intuition is neither imprisoned in discursive language, nor in other specific forms of communication such as words, ideas, lines or ways of thinking, geometric or plastic forms, sensations caused by sound, noise, luminosity, taste, touch or smell. Truly, it appears that intuition translates existence at the *level of reality* from whence stem intuitive thoughts.

Third postulate – The existence of the *other*, as the third included or excluded.

The transdisciplinary approach suggests a third state of consciousness wherein *the other* exists, enabling it to be or not to be included or excluded in relation to the observed. We know that *other* is an indefinite pronoun: a different or an additional person or thing. It can refer to something personal as well as impersonal, human or inhuman, great or small, colored or uncolored, opaque or transparent, a lot or a little, lasting or transitory, light or heavy, present or absent, current, past or future.

In transdisciplinary observations, the presence or absence of this *other,* because it is limitless and indefinite, and may unduly be being included or excluded– is always a sign that *humility* ought to preside in the knowledge inquiry process. Hence, transdisciplinary vision is resolutely sensitive to propitious openings of new knowledge in so far as it surpasses the dominion of the exact sciences. It imposes, through its dialogue and tendency, to reconcile not only with the human and social sciences, but also with literature, poetry and spiritual experience.[2].

The fragments and the disciplines in the knowledge process

When we refer to the object of a discipline we mean to convey the set of phenomena whose characteristics are, or can be contained or delimited by the intellective resource in this specific field of knowledge. We know, and scientific practice has proved, that only theoretically, vis-à-vis the artifacts of the *imaginary* and of *science fiction* can the phenomena be totally isolated, contained and perfectly delimitated. In practice, such procedures always present themselves at certain levels of reality according to the order of magnitude which is particular to each of them and is contained within the limits of acumen of the respective forms of perception. There is also no doubt that the process of reduction in the fields of observation are subordinated, when less, to one of the rules of Cartesian method, which is that of analysis. This, by its very nature is fragmentative and, as it is inherited from Greek culture, we are not used to separating ourselves from it.

[2](Cf.art. 5. º da Carta de Transdisciplinaridade

When we order our ideas, the analytical process leads us to reducing our difficulties and incomprehension to the smallest possible dimensions, focusing them in a more appropriate level of reality where they can be classified, understood and resolved, one by one.

From the smaller variables, the synthesis enables us to form a set of answered questions that allows a broader range for comprehension and understanding. From an analytical fragmentation point of view through transdisciplinary methodology founded on holistic perspectives, we endeavor to render our intellect fit to better comprehend our context.

In simultaneously exploring the diverse levels at which distinct realities coexist, transdisciplinarity, through its postulates and method, offers an ample perspective of human wisdom announcing the broad scope of holistic view. Through this vision without boundaries, a transdisciplinary attitude signals with the possibility of overcoming space-time and of approaching the Sacred. Descartes satisfies the anxiety for the truth and propels us toward knowledge of our own selves.

Acknowledgments

This work and the efforts developed herein, endeavor to continue to provide me with the vital *amorousness* that propels me as a human being who happily travels through the divergent fields of knowledge. In this flow of ideas, lines and forms of thinking it is imperative to honor those who transmitted attention, information, love, and above all, the ethical principles that give life meaning.

Our studies began with the writings of William Pepperell Montague, when he approached the paths of knowledge. It has never excited us to criticize, or contest Montague's methodological content, nor that of any other thinker. Nor, did we have any intention of adding anything to theirs. The methodology of knowledge aided us as a guide on the path through which we esteemed reaching the transcendental and sacred both emergent from the effort to integrate fragments. This cognitive experience, with the transdisciplinary attitude in our lives was initially aroused by Ubiratan D´Ambrósio and Dirceu Borges from their works at the Peirópolis Foundation. To both, we are sincerely grateful.

I remember with longing and affection my parents, grandparents and the others who as true hierophants, bequeathed unforgettable lessons. Hamilcar Turelli, Leila Cury, Aldo Perracini, Walter Toledo Silva, Francisco Hoffmann e Benedito dos Santos, who are still in the trenches of life and were a great part of my intellectual life. There are others whose memory I associate to competency and dedication to learning and education, and who no longer can dodge my personal gratitude: Lélio Canevari, Nicolau D'Ambrósio, Albrecht Tabor, Fritz Ackerman, Fritz Pietschke, Alfredo Silva, Geraldo dos Santos and countless others who delineate in my already remote childhood, tracing the initial readings.

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Chapter 1

Method and Methodology

1 – What is method?

Whatever action, be it effective in theoretical life, or in the broad world of realities that to us seem concrete, of fantasy and fiction, impels us to search for references by which we can be guided.

We call life, or theoretical living, the processing of ideas the contents of which we are able to approach through abstraction of the reality via rationalism, authoritarianism, mysticism, skepticism, intuitionism and amorousness. The expression gives a feeling of dealing with the abstract, and the idea of contemplative life. By practical living, we understand the experiences reaped in the world of sensorial realities, especially by means of the intermediation of empiricism and pragmatism. The world of realities relates to an all- inclusive universe that encapsulates not only the imaginary, but also the real, and for this reason is called world; embracing the true and the false whether concrete or abstract, as well as the fictitious, including dreams and hopes. It comprehends the past, the present and the future embodying all the contingencies and necessities that are part of them.

In fact, we almost instinctively try to attach sign posts to the areas in which we experience life so that they can signal elements as to our location. As we tread our path, we strive to identify the landmarks of the course.

In practice, however, the itinerants are much more daring. They very often advance without any references. They venture through reality without the previously recommended speculations of authoritarianism, rationalism, empiricism and pragmatism. They set aside the imperatives of action dictated by the rational and empirical and move onward guided by a process that is not only intuitive, but that stems from the jumbled desires they consciously avoid rationalizing.

Alfredo Pena-Vega cites Edgar Morin in affirming that the sciences whose purpose is to know nature and its relationship to human beings, find it extremely difficult to integrate them into conceptual postulates, particularly in the interactive effort of conceptualizing life, nature, the human being and society. He clearly explains that:

> *... ... The science of man and nature would have even greater difficulty in integrating their conceptual postulates, especially in terms of units of interaction: Life / Nature/ Human being / Society, indispensable in explaining the complex procedures of adaptation, survival and disappearance that govern the evolution of the ecosystems. It seems necessary at this point, to try to attempt a theoretical and conceptual "reforming of thinking" in order to incorporate into the sciences of man the concept of life and/or inversely, an ecological science capable of integrating in its reflexive development, a new approach of anthropo-social dimension*[3].

Thinkers habitually dream with their eyes open, projecting actions with a direction and meaning that they would never consciously adopt in practice. When awakened to the demands of material reality, they try to recall what happened from oneiric memory, but are generally unable to draw into the state of consciousness the true cause of their mental processes. Only then, do they realize that the markers left by the lines of thinking in which the dreams occurred are fragile and diffused when not confused.

[3] PENA-VEGA, Alfredo. *O despertar ecológico:Edgar Morine a ecologia complexa*. Tradução de Renato Carvalheira do Nascimento e Elimar Pinheiro do Nascimento. Rio de Janeiro:Garamond, 2003.

The language of dreams whether nocturnal or diurnal, is often constituted by apparent disconnected signals lacking the sensorial support that would allow it to reconstruct the sequence of the oneiric thoughts. To some scholars, the unconscious is atemporal.

On the language of dreams: Fromm[4] wrote:

> *Babylonian, Indian, Egyptian, Hebrew and Greek myths are rewritten in the same language as that of the Ashantis or the Xavantes. The dreams of a person living today in New York or Paris are the same as those registered by persons living a thousand years ago in Athens or Jerusalem. The dreams of ancient and modern man are written in the same language as the myths whose authors lived in the dawn of* history.

The step that initiates the search for paths to knowledge begins with the selection of the method. It is a process that takes us to situations similar to those that occur when we awaken from dreams.

The return to *the state of consciousness* occurs via vague images. Upon awaking, these images emerge through the intellective actions of comparison, definition and recognition. The conscious state demands a mapping of the representation, of the signals and of the signs observed. Thoughts are compiled by means of synthesis of the data obtained through personal observation. The information resulting from the observation be it theoretical or practical, indicates the most diversified models of relations such as presences, absences, positions, durations, or other forms of manifestation of the phenomena. Induced, at this point is the construction of supposed personal, owned, convenient and opportune thinking forms.

Through a series of observations and the ordination of arguments, we begin to believe that mysticism, authoritarianism, rationalism, empiricism, pragmatism, skepticism, amorousness and intuitionism are fundamental methods, and that by combining them, we can identify the different levels of reality through which the tracks of knowledge meander.

Selecting a method is tantamount to choosing a path that allows approach to the level of reality in which we find ourselves. To the peregrinators of the intellect, several itineraries, innumerous trails and the most diverse paths are allowed. The wisest prefer to also avail themselves of alien experiences, forewarned of failures that are oftentimes irreparable consuming long periods of their lives. After all, the experience teaches that spent in mistakes, the time of life is not recuperated.

We know that sometimes it is possible to withdraw from equivocal and directional mistakes that distance us from our purposes. But for now, only imagination and science fiction have allowed us to successfully retreat from the axis of time. Time is something that appears to be irrecoverable. Time poorly used, is life poorly lived. Wasted time is life consumed without advantage. We are intuitively led to believe that it behooves those who want to advance in the direction toward knowledge do so with assurance, firmness and at a cautious speed compatible with their own potentialities. Reason and the will to live envisioning the use of knowledge and thing compel us to choose appropriate paths to better utilize the assimilated knowledge.

The experience teaches us that we reach our objectives either by accident or by applied diligence. Failing this, we rest at the margins of the intellective process where we define a part of our human nature. In our intellective approach, we seek to polish our advances with information heralding from common sense. Hence, the advances will be penciled in discursive language, translated into the Portuguese spoken in Brazil and will have as its informational base the authority that is informed us through dictionaries be they etymological, grammatical, encyclopedic, or of the specific jargon used in the respective fields of knowledge..

Comentário: Gustavo, talvez queira se referir ao inglês aqui.

[4] FROMM, Erich. *A linguagem esquecida*. Rio de Janeiro: Zahar Ed. 1964, p.14.

The word *method* comes from the Greek μεθοδοζ (read *Méthodos*). This entry in the dictionary points to several meanings, some of which we highlight here: *path, procedure, form or mode of action, manner, and procedural treatment.* In the figurative sense, it also means *prudence, attention, circumspection, judicious manner of proceeding; order.*

Several options can be used in journeying in the direction toward understanding and becoming aware of the myriad mental processes involved in the cognitive approach. It becomes easy, then, to see that various methods are passive in their use. In fact, many are the inroads to knowledge. There are specific uni-disciplinary methods applied to specific disciplines. There are interdisciplinary methods that propitiate knowledge approached through different disciplines. There are pluri and multi-disciplinary methods, where the trajectory is determined by information gleaned from the many different disciplines. This happens when the creeds are diversified and relate to each other in different fields of knowledge, when not, but also in different levels of reality. There is, however, a method that seems more appropriate, the fundamental object of which this approach defined in the transdisciplinary attitude by many is understood as a belvedere from which open the horizons of holistic knowledge.

Dictionaries provide several meanings contained in the entry *method* that are indicated by different practices and disciplines. They conduce to intellective contexts that open themselves up to approaching the cognitive phenomena enabling their study.

We can verify in each field of knowledge how the scholarly journey along various trails meandering through different levels of reality leads us to presume myriad triumphant possibilities. Yet, while we concurrently try to function rationally, we notice that while we grope amidst the fog of the unknown, we let ourselves be guided, sometimes less, sometimes more so by the mysteries that considerably encapsulate what we allegedly know. Emerging from supposed ancestral knowledge originated in archetypes, *mysticism* induces us to accept the propositions which turn *creeds and justifications* reductive, signaling the roots and pre-requisites of that which we call scientific knowledge.

Furthermore, we receive *intuitive signals* that space and time are inseparable, being imaginarily occupied by variations of knowledge, like that of the Universe. Both lead us to believe that they are devoid of the geometric linearity revealed in the pluri-dimensional curvatures suggested by trigonometry. It is from this point of view that knowledge is presented to us, and in like manner, the Universe is perceived: in other words, in expansion projecting and representing curvatures.

On the other hand, we believe that the methods, as efficient as they may be, cannot be inflexible. To the extent that objects of knowledge reveal themselves dynamic, we must accept that the paths to apprehend them also reveal themselves mutable.

From the method recognized as *authoritarianism*, we receive a series of information translated by *affirmations from which we do not engender doubts.* They are signals arising from various inputs of facts and actions, paths from which the same nature of creed and justification are attributed to ideas and ways of thinking.

We observe that one eminently *utilitarian* feeling is present in the course taken by the intellect. We want to know the cognitive process seeking to reduce operational costs and better income. We want to act to increase personal or collective gains and to reduce eventual losses. From this *pragmatic ritual* there clearly emerges a work-result relationship, reduced by economists to the expression *cost-benefit.* Pragmatism is, in itself, one of the ways leading to knowledge, and possibly the closest to our way of evaluating what best suits us.

Experience shows that in the majority of cases, specific methods comply with the pragmatic ritual of attending to the use of knowledge in view of the personal interests of the people involved. The human being, very often, lets himself be dominantly guided by *pragmatism,* translating it as the method that justifies the search for knowledge because of the services it can render to human beings, which in other words, translates to the use derived from it.

Utility is understood, from the Latin utilitas, tis, *a noun indicating how to use or take advantage of an action, thing, object, or person keeping in mind the human interest of the subject that defines the direction and the meaning of the observation. The word carries the meaning of servitude being rather of the thing or person who renders some benefit in his own favor, or to someone else. It can be considered a subjective or objective utility. The dictionary definition signals the result of a phenomenon whose object, thing, action, use or function meets the interest of some agent, or patient in an ethical relationship. It translates the nature, or what is proper of the being, object or person in relation to someone, or to the collectivity to which it is related.*

In fact, *pragmatism* is one of the methods proposing to justify the search for knowledge by benefits that from it can result to the human being. For this reason, the pragmatic questionings are frequently in intellective processes.

A large part of the methods recognized as specific by scientific literature present characteristics responding to *empiricism.* This is because they correspond to the utilization of *one's own experience and from the experiences of others.* The experience of others serves as a basis for knowledge as long as authoritarianism is accepted as resulting from the additions translated as truths through the words of historians to whom we give credit. These are methods to which we give much attention, for they are the hallmarks of our personal experiences and those of others to whom we attribute moral and scientific authority.

There are thinkers who dwell within the limits of *rationalism*. Intellectual tradition of the West places great value on the act of thinking when the procedure results in the ordination and systemization of ideas. In this same tradition, those who work with organized forms of thinking with a minimum of rationality are designated *philosophers*. They are subjected to the principles of logic and epistemology. So being, these thinkers express ideas in an orderly fashion in view of the necessary relations that define the relation *cause-effect,* the differential *antecedent-consequence,* and the ordering chronologic *anterior-posterior,* collecting observations in which truth is subjugated to the need for temporal proof, be it empirical or logical.

Citing Gianbatista Vico, Pena-Vega stresses that:

> ... today we witness a true crisis in confidence regarding modern science, and from this crisis there blooms a conscientiousness for a necessary transition to another contract with a *"scienza nuova", based on the cooperative unity between predictability / unpredictability, certainty / uncertainty, determined / undetermined, complicated / complex and order / disorder.*[5]

Rationalism concerns the set of abstractions through which is sought the identification of the *casual relationship* to which the phenomena reacts. It permeates the series of projected facts in the axis of time looking for an atemporal relation in which to characterize it. Conversely, it aims to express the reach of the *law of cause-effect* granting that the search identify the *necessity and sufficiency* in the element that integrates the phenomenon.

Another indispensable method for obtaining knowledge is *skepticism.* In life's flow, we are often stricken by *skepticism*, by the *sequential doubting* that leads to alternating between belief and disbelief, assuaging doubts and suggesting certainties. Life teaches that in our movements, we are touched by sentiments and emotions. Within the natural forces that act on human beings *amorousness* is highlighted. Attracted by the delights toward which it takes us,

[5] PENA-VEGA, Alfredo. *O despertar ecológico:Edgar Morine a ecologia complexa*. Tradução de Renato Carvalheira do Nascimento e Elimar Pinheiro do Nascimento. Rio de Janeiro:Garamond, 2003.

we advance happily in the fields of knowledge. *Consciousness* of what is love, leads us to treat *amorousness* as the most pleasing and effective method of knowing.

Amorousness, as we refer to it, is part of the system of universal forces that act in the sense of maintaining and preserving existing forms and combinations in the universe materialized in animate and inanimate beings. As a vector, it is identified by its *intensity, direction, feeling and application.* Intensity, direction and the feeling of universal love impel Nature, as well as everything integrated within her, with the disposition to preserve the generic, or specific characteristics determinants of their condition for existence and perpetuation..

Finally, human experience signals that intrinsic in each human being is the cognitive effort marked by *intuitionism,* which enables comprehension and understanding under the auspices of thought forms that arise outside of the demands of logical and empirical reasoning. *Intuitionism,* therefore, reveals itself to be a creative and inspiring path, genuinely a *method* that leads to self-reliant knowledge.

Comentário: Gustavo, the following is the deifinition for **self-re·li·ance** (sĕlf´rĭ-lī□əns) *noun*
Reliance on one's own capabilities, judgment, or resources; independence.
— self´-re·li□ant *adjective*
— self´-re·li□ant·ly *adverb*[1]

2 – Information emerging from philosophy

Philosophical understanding suggests some conceptual convergences and many divergences. Walter BRÜGGER[6] affirms that:

> *... Method and system make up the essence of scientific knowledge in which the system represents the aspect of contents and the method the formal aspect. More precisely, we designate* system *the ordered set of knowledge, or the content of a science. Contrarily, we characterize as method, the path followed to construct and reach the said whole conforming to the etymological meaning of the word* path, (in Greek *με οδοζ, shortcut, a vocabulary compound of οδοζ ,* way, *and μετα (together with, beside, from where, "shortcut, encircling"). Generally speaking, we methodically concentrate on one dominion of knowledge when we research it following a plan. We single out its peculiar articulations, order partial knowledge according to reality, and connect them with the strictest logic for intelligibility consonant with the case, availing ourselves of demonstrations; in the end, we ought to know, from each and every thing, not only "what it is", but also "why it is" one way or another, and subsequently, not only the fact, but also the reason for it. The transfer of a particular method from one science to another can falsify and even nullify all the work; for what follows when, for example, one plans to elaborate metaphysics with only natural science's method. St. Thomas of Aquinas had already prepared a clear separation of methods through the distinction he makes between the three degrees of abstraction: a distinction he develops following the path opened by Aristotle. For above physical abstraction (natural scientific) and mathematics, there arises metaphysical abstraction which considers the entity as long as it is so.*

André LALANDE[7] explains that the word *method* carries three fundamental meanings, namely:

> ***a)*** *the first, etymologically translated "persecution"(cf. Μετερχομαι) is consequently, an effort to reach an end, research, state; from where among the moderns, two very close conceptions meet and are distinguished thusly: 1- The way in which one arrived at a certain result, even when this way was not exactly fixed or reflected in the manner desired. Here, we call "ordering" the action of the spirit whose diverse ideas, diverse judgments and diverse reasoning on the same subject points to the best manner in which to know this subject. It is this that is still called method. All this, sometimes occurs naturally and sometimes better when executed by those who have not learned any rules of logic compared to those who have learned them.(Lógica de Port-Royal, Introdução, 6-7) . 2 -A regulating program to advance in a series of mandatory operations and which signals certain mistakes to be avoided when seeking to reach a desired result.* **b)** *the second fundamental meaning suggests the connotation "technical procedure of calculating or experimenting: "The method of the smallest squares", the method of Poggendorf" (employment of the movable mirror for measuring angles);* **c)** *the third meaning implies the idea of a system of classification (above all in Botany: John Ray, Methodus plantarum nova, 1682).*

[6] BRÜGGER, Walter. *Dicionário de Filosofia*. S. Paulo: Herder, 1969
[7] LALANDE, André. *Vocabulaire Téchnique et Critique de la Philosophie.* Paris: Quadrige-Presses Universitaires, 1997.

And still, Lalande who affirms that *the idea of method is always from one definable direction that can be regularly pursued in one operation of the spirit.*

Descartes, in *Discurso do Método (Discourse on the Method) , I, 3,* recommends*:*

> *...fallen in with certain tracks which have conducted me to considerations and maxims, of which I have formed a method that gives me the means, as I think, of gradually augmenting my knowledge, and of raising it by little and little to the highest point which the mediocrity of my talents and the brief duration of my life will permit me to reach..."*

Rudolf Bölting[8] in his *Dicionário Grego (Greek Dictionary) - Português*, clarifies: μεθοδοσ, ον . *N. f. Path, via, rule.* μεθοδιοσ, *confining.* μεθοδ (ε) (α, ασ) *deceit, ambush, fraud, deception,* μεΘοδιχοτησ, ητοσ*f., method, system, rule, pedagogical order, mode of proceeding, custom, way.* Bölting teaches that the Greek adverb μετα , written with the letter *tau (T)* and not with *teta (Θ)*, as mentioned by Brügger, leads to sundry meanings such as: *in the middle, between, beyond; as* a preposition and genitive, it means *between, in the middle, beside, together with, under, in, in accordance with;* as a preposition and accusative it means: *after, into, second, according, between.*

One need only to observe, that the etymological reference, μεταδω (read *methodo*) means pursue, which is different from μεθοδοσ,ον, (read *método*, *on*) path, track, itinerary, in which the radical is written with teta (Θ) and not tau (τ), where the prefix *meta* leads to the meaning of objective, or goal to be reached. Accordingly, we understand, in this work that *the method to knowledge is the way that thought can go,* in a voluntary or conditioned manner, guiding itself by markers that signal to the advancement of intellectual processes.

Comentário: METHODIOS Latinized form of the Greek name *Μεθοδιος (Methodios)*, derived from Greek *μεθοδος (methodos)* meaning "pursuit" or "method", ultimately from *μετα (meta)* "with" and *'οδος (hodos)* "road". Saint Methodius was a Greek missionary to the Slavs who developed the Cyrillic alphabet (with his brother Cyril) in order to translate the Bible into Slavic http://www.behindthename.com /php/view.php?name=metho dius

It is important to note here, therefore, some of the differences between the concepts of *method* and *system*. When we speak of *method* we immediately think of a way that is at least from one point of departure to a point of arrival. *System,* however, involves much more than the mapping of a way. *System* is a dictionary word signifying *the interaction* of elements, parts and particles, movements, fluxes and refluxes when they perform a common action. When we focus the interests of human beings, the system should express *utility,* in other words, a *possibility for reaching and realizing a determined object.*

In late 1948, Brazilian philosopher, Euryalo Canabrava was already teaching that:

> *"The physical systems are defined through the state functions where arguments are represented by classical variables such as space and time, or by determined quantities such as weight, volume and density. Physical objects can be represented by certain properties selected from among myriad others which change over time in extension, color and configuration. A combination of these properties, according to Margenau, characterizes and defines the state: they are measurable and therefore reductive to numbers. The expression "physical system" covers all and whatever structure that is characterized by observable properties tantamount to the electro-magnetic field, electron, particle or wave. But, system is an ambiguous word, susceptible to innumerous applications and metamorphosis; why not use it to designate wealth, value, function of capital in the economic process or business cycles? Admitting, then, the existence of economic systems in which variables of state would integrate them, how would we determine their respective values with forecasting instruments that would, in this case, follow the natural laws of economy?*[9]

When we check the meaning attributed to the dictionary definition of *system* through *pragmatism*, recognizing in certain organs determined specific functions or exercised processes in the set they integrate, we try to identify the *signification of a heterogeneous set* in which the parts function, act, integrate, exist, and operate together. Thus, in this case, we are not talking about a *method,* but about a *system*.

The dictionary definition of *system* contains various meanings, among which we endeavor toward the most common. Implicit in this, is the meaning of convergent ideas sys+thema), or

[8] BÖLTING, Rudolf. *Dicionário Grego-Português*, R.Janeiro: Ed. Ministério de Educação e Cultura, 1953.
[9] CANNABRAVA, Euryalo, apud *Revista Brasileira de Filosofia*, vol. I, p.39, S. Paulo.

rather, of themes that have common relations. The concept of system interlinks sets and subsets, identified by reasons common to various elements in a determined universe-set to form a complex whole. *Systems* also carries a meaning resulting from a conceptual abstraction, a product of human intelligence, obtained from observation and from the effort to understand nature more closely than we suppose possible in that which is being enunciated by a reality.

Comentário: Translators inclusion

The enunciated, as Morris[10], teaches in Semiótica, *are the interpretants of a system.* They refer to the cause-effect relationship, or to the expressions antecedent-consequence by which the sets of elements that integrate the system can be recognized. The systems are distinguished through experiences, evidence, or hypotheses generating justified beliefs.

Tackled from the pragmatic meaning which identifies the functioning of the sets to which they refer, the systems can be either simple or complex, primitive or derived, abstract or concrete, live or inanimate, auto-sufficient or dependent. They can be considered fictitious systems in that they refer to hypothetical knowledge. We believe that there is a solar system of which the Sun is the center and around which the planets orbit. We believe that we live within this system. Even though skeptics doubt these beliefs, the majority of scholars accept them as true.

Nevertheless, we can agree as a participant in the Universe, that there is a possibility of our being subject to rules more prevalent than those regulating the solar system. If we accept as true the affirmation that the laws that regulate the macro and micro physical spaces are other than those announced by Newton and Galileo, this possibility ought to be projected into the realm of probabilities where it should be evaluated so as to anchor some cognitive meaning.

Based on advanced studies on electromagnetism, we can see that there is a strong link between psychic phenomena and the principles of approaching knowledge. It seems obvious that knowing comes from the systemizing of thoughts. We know that psychic phenomena occur within the electromagnetic dimensions. Consequently, they are studied in neurophysiology. It is also licit to suppose that the electromagnetic vibrations of the Universe are, by nature, the same or similar to those occurring in our nervous system, and particularly in our states of consciousness. From these premises, we note that the solar system is only apparently a system, but in fact, in the order of magnitude of galactic phenomena, is only an asystematic miniscule organ referred to as a system only within the parameters necessary to contextualize it in human thought.

Comentário: Sem systema?

The idea system expresses a set of relationships in a determined universe-set. The meaning contained in the expression set-universe is always a fiction elaborated by the human mind. In as much as this hypothetical universe reduces or amplifies, the process to identify it can become invalid, incoherent and incongruent. Consequently, the supposed fundamentals of truths in which the referred system is structured and comprehended can be validated, invalidated or excluded.

That's why, when we speak of methods of approaching knowledge, we can understand the possibility of expressing a determined system, but, in fact, in regard to a methodology, the systems should be considered contingencies. This means, they may or may not occur in the way in which they appear, are recognized, described or identified. The methods may or may not lead to a comprehension of the systems, that is, they may or may not lead to obtaining true synthesis.

If scientific belief in relation to the sun, planets and moons were to be considered false and were verified that what we designate as the solar system is, in fact, a set of a systematic elements, one could conclude that the idea of a solar system is nothing more than fiction. In the

[10] MORRIS, C. *Fundamento da teoria dos signos.* S. Paulo: Ed. USP,1976,pp.13 e 14.

same way as the methods occur, there are a large number of *systems of thinking* used and studied in the approach of the many disciplines and in the most diverse fields of knowledge..

Fritzjof Capra recognizes two fundamental currents that flow through the limits of scientific thought where trying to explain what live systems are. He affirms citing Haraway's studies:

> *Before an organism was born, many prominent biologists went through a vitalistic phase and for many years the dispute between mechanism and holism was viewed as a dispute over mechanism and vitalism.(…) /Vitalism as well as organicism oppose reduction of biology to physics. Both schools affirm that while the laws of physics and chemistry are applicable to organisms, they are insufficient for a complete understanding of the phenomenon of life. The behavior of one live organism as an integrated whole cannot be understood solely from the study of its parts. As the systemic theorists declared many decades later, the whole is greater than the sum of its parts.*[11]*...*

We shall see the relationship between method and system in this search for knowledge. From Capra's scientific empiricism translated into biological knowledge to scientific authorities like Haraway and the systems own pragmatism which seeks to translate the service of thinking forms that systemized, but not necessarily systemic, serve determined methods. Lastly, through skepticism, as in the anti-mechanistic case, supports itself on rationalism to induce a conclusion that the all is greater than the sum of its parts. Capra further clarifies that:

> *... The organismic vitalists and biologists clearly differ in their answers to the question: "Exactly in what sense is the whole greater than its parts?" The vitalists affirm that some non-physical entity, force or field must be added to the laws of physics and chemistry in order to understand life. The organismic biologists hold that the additional ingredient is the understanding of "organization", or of "organizational relationships"*

The same Capra asserts that *since the beginning of the century it has been known that the organizational pattern of a living system is always a network pattern. Notwithstanding, we also know that not all network systems are live systems.*

In order to further clarify the difference between method and system, one notices that it would not be suitable to speak of *live methods* or *inanimate methods*, but of the *efficient or inefficient methods that are, or are not used which lead, or not to knowledge.*.

[11] CAPRA, Fritzjof. *A Teia da Vida.* S. Paulo: Cultrix,1997, p.38..