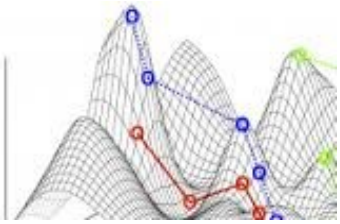
Journal of International Union for Interdisciplinarity and Transdisciplinarity in Complex Systems



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International Union for Interdisciplinarity and Transdisciplinarity
in Complex Systems - <<IUITCS>>

Content

Argument

Journal 2 of the “International Union for Interdisciplinarity and Transdisciplinarity in Complex Systems” - <<IUITCS>> proposes the expert submission of some notifications and comments from the point of interdisciplinary and transdisciplinary point of view related to the current international results and having a scientific and humanist profile. The texts of the Journal are referring to the high-performance university and academic studies. In order to put into light the concerns for the XXIst century interdisciplinarity and transdisciplinarity and to evidentiate, at the same time, the significances of the respective fields, Journal 2 will open with an argument review of the general issues and also of the structure related to them. In this edition, are shown and commented some interdisciplinary and transdisciplinary scientific aspects which find their place within complex systems, the forms which can be taken out from the results that have been granted the Nobel Prize in 2024.

Interdisciplinarity and transdisciplinarity existing in complex systems – current aspects

"IUITCS" Scientific Board

Nowadays, within the international scientific segment, one may notice the continuous existence and requirement for a well-marked interdisciplinarity and transdisciplinarity, with pertinent significance. Thus, by means of interdisciplinarity, a "cross-fertilization" with epistemological level takes place; it pertains to the research and analysis of the knowledge hermeneutics obtained by means of an optimal redefinition of general concepts, logics, methods appplied to the scientific research and humanism, to the philosophy of the latter. It is to remark the "transversality" which characterizes interdisciplinarity, as well as the scientificity which is already to be remarked, making its presence still known within the transdisciplinary disciplines.

The complexity of the subject matters, as well as the considering of the close results among them, of the simultaneity in achieving the different research steps proper to the harmonizing of the languages used, of the limitations implied by the auxiliary aspects, sometimes having determinant influences on the scientific "targets", are also useful in an (upward) modification the intellectual attributes of the Human beings, obtainable in an interdisciplinary and transdisciplinary way.

The knowledge supposes integrativity and convergence, as well as forms exercitated on the study and research of a subject matter by two or more disciplines having, most times, as an objective, also obtaining a local "wholism".

Currently, some new methods are proposed to optimize the research field proper to interdisciplinarity and transdisciplinarity of complex systems, thus trying to avoid the possible redundancies, as well as heterogeneities, dissipations, non-integrativities, influences of the non-neighbouring results proper to non-harmonized langauges. Thus, a complementarity of interdisciplinarity and transdisciplinarity concepts takes place, implying the recent mechanisms of integrative research, but observing, however, the disciplines of an academic level, the requirements of the latter being maintained by means of an optimal reorganization and by means of specific intelligently built softwares. Thus, is generated the emergence of new disciplines, proper to the XXIst century. They imply professional competencies recently appeared, and no discipline will be superior to another.

Essentially, a number of six funamental complex systems are considered: a) physical and chemical; b) bio-molecular and cellullar; c) physiological; d) organisms and populations; e) social-human and economic; f) engineering. Within those systems are to be found different research subject themes, such as those referring to emergence, complexity and bio-complexity, self-organization. The current forms, proper to the concerns taking place within complex systems, consider the (mathematical, physical, chemical, biological) modelling (existing in cognitive disciplines), the evolution and adaption, the colective behavior, the non-linear dynamics and bio-dynamics, the theory of games, the theory of systems, the theory of networks, each having, in turn, numerous distinct components which interact among one another. At the same time, the number of the level of scale is considered; the primary level is proper to the common, non-structured behavior. There is an intensive (vertical) hierarchy of the former within which, at a certain moment, appears a structure that assures quality by means of its processes and mechanisms. Thus, the optimal development of functionality, proportional with the hierarchic growth of the level of structure (including the biological one) takes place. E.g.: within the living processes there are: the common molecular matter (non-structured) (level I), the bio-structured one (level II), the noesi-structured one (level III). As concerns the extensive (horizontal) hirarchy, are considered the interior relationships, proper to the system and exterior ones (with third complex system, such as the environment), as well as the forms of evolution (one can notice that they take place also within the intensive (vertical) hierarchy). When considering that, are taken into account the general concept of system, the necessity of some optimal flows of energy to exist, for its functioning, as well as Newtonian space and time, quantum processes, biological information (including genetic + epigenetic), bifurcation, space of phases, statistic aspects, adaptativity and evolution.

There are essays that concern interdisciplinarity, where it is remarked the fact that in some West-European states, such as U.K., Holland, Belgium, Germany, France (*University of Paris "Sciences Po"*), there are concerns regarding the field of interdisciplinarity, but also in the USA (*The Center for Studies of Interdisciplinarity, The Faculty of Graduate Studies of British University Columbia, Fairhaven College of Bellingham-Washington, Stanford University (software of the types:Bio-X-biology, medicine, bio-mathematics (modelling in genetics and evolutionist biology, bio-computational disciplines)), bioengineary – University of Pensylvania*). To be remarked, too, in the USA – *Association for Interdisciplinarity Studies, International Network of Inter.&Transdisciplinarity*, *Philosophy of/as Interdisciplinarity Network, Center for Study of Interdisciplinarity – University of North Texas*. And so on. Thus, it is generated a new modality of

approach, what, in fact, the philosophy of interdisciplinarity considers to represent an "ontological unity of disciplines".

Interdisciplinarity and transdisciplinarity may be also found in humanist disciplines (general-theoretical philosophy, as well as theology – with its aspiration towards ecumenism, hermeneutics, semiotics, general antropology and antropology of culture, psychoanalysis, philology, linguistics and psycholinguistics, economy and bio-economy, legal disciplines, history, sociology, politology…), obtainable by means of establishing some connections existing among the classical domains and the new ones, which emerged in the XXth-XXIst centuries. It is also taken into account the perspective to come, by connecting the humanist disciplines with the non-humanist ones, some of those having a dominant actuality (artificial generative intelligence, computational legal studies and others).

For instance, it is to be remarked a domain with an interdisciplinary and transdisciplinary status + a great amount of instrumentalism, named "neuroscience", which also contain domains such as mathematics and bio-mathematics, physics and mathematical physics, theory of operators (existing within quantum disciplines), biology (cellular, molecular, synthetic), biophysics, biochemistry, philosophy of science and epistemology, neurophilosophy, neurolinguistics and psycholinguistics, bio-psychology, medicine, genetics and epigenetics, medical imaging, bio-complexity, sciences of computation, nanomedicine, neuroetics, neuroinformatics, neuroengineering.

One should also remark the major concerns of bioetics that include interdisciplinary and transdisciplinary elements (contributions) in the following fields: biology, genetics and epigenetics, medicine and biotechnology, artificial intelligence and mathematical, physical, chemical, teological, antropological, legal, philosophical, sociological modelling…

There are important subject matters and also considerations, in time, belonging to remarkable thinkers, philosophers and logicians, such as Georg Cantor, Gottlob Frege, Edmund Husserl, Martin Heidegger, Karl Popper, Rudolf Carnap…, who generated and claimed some scientific and philosophical ideas, very significant in our days, too, for the thinking and judgement (interdisciplinary and transdisciplinary direction), some of which having futurist attributes, too.

As compared to the period of about fifty years ago, currently, the situation of non-humanist sciences, but humanist ones, as well, has been much modifying; a feasible solution is the one generated by the approaches of interdisciplinarity + transdisciplinarity, since the functional framework of the latter is continuously optimally-rebuilt, based on significant ideas, intelligently applied.

As concerns the special significance pertaining to transdisciplinarity, one can distinguish three fundamental components. Transdisciplinarity is different from interdisciplinarity. The three components of transdisciplinarity refer to (I) the knowledge existing within disciplines, exterior connexions which may take place with other academically accepted domains (even border ones) (II), within the context (III) of some "evaluations" when (potentially) considering the levels of reality, where some of these are "felt" and "intuited" by the Human being, by means of some forms proper to neurophysiological perception, some others - not. Different forms of logics are used, too (in the superior-experencial, phenomenological, and not at all common, trivial situations) which do not fit into the forms of Aristotelian logics, but having, however, consistency (e.g.: logics of the third party included, third, polyvalent type of logics, the principles of tetralemma, others). In this sense, it has been accepted to include the issues of transdisciplinarity also in the category of those pertaining to complexity, biocomplexity, as well as chaordicity (appliable to situations when complexity and biocomplexity go beyond the human understanding). An essential requirement of transdisciplinarity is represented by the characteristic of the temporal simultaneity of the three forms - I, II, III -, a fact that cannot exist within a strictly interdisciplinary framework. Transdisciplinarity has also a methaphysical aspect (that goes beyond the common rationality of the human being, as it is, trivially known), an aspect which, sometimes, is no longer taken into account by the university and academic environment. This may, however, represent, in the context of the current period, but also in perspective, an interesting method of study, to be possibly considered also within the fundamental research which is complementary to logics, methodology and philosophy of science (sometimes, named classical). It is useful to remind, in the context of component III of transdisciplinarity the Borromean regions, too, which specially refer to the triad Real – Imaginary – Symbolic, where the Human being is at their intersection; the Real "zone" is not accessible to the latter, since it is different from the ontic reality (Heidegger).

To close the current essay, we also consider the situation of the systems of complex systems. In this context, a complexity of level 1 takes place, existent within each system and a complexity of level 2, more remarkable, which takes place among the (global) systems of complex systems, consequently including the systems of level 1. When thinking of interdisciplinarity and

transdisciplinarity existing within complex systems of level 1, it is necessary to take into account, at the same time, the systems of systems that have this form, which consequently also implies the intersystemic analysis of the relationships among the systems that include complex systems of level 1. This aspect makes a difference between some of the current concerns of the <<IUITCS>>, and the series of the objectives proper to the analysis of common complex systems. The interdisciplinary and transdisciplinary relationships existing within complex systems of level 1 and among the systems of complex systems of level 1 represent modern concerns that sometimes also have phenomenological aspects. Example: Social systems of a complexity of level 2, containing systems with a complexity of level 1, are currently represented by the European Union, as well as the United States. In the first case, the component states of the European Union represent complex systems of level 1 of complexity and in the second case, the complex systems with level (degree) 1 of complexity are represented by the states composing America. Between the two multinational forms, multistatal-regional, respectively (each having a complexity of level 2) containing systems of complex systems of level 1 of complexity, some relationships also take place. One can also remark examples in cosmology, as well as in other third domains. The category of complex systems of level 1 of complexity also may include the big systems (current scientific name), having numerous sub-systemic components. It is useful to remind, however, the fact that big systems can sometimes constitute systems of complex systems.

We close this segment of the analysis with a rhethoric question *(President of IUITCS)*, regarding interdisciplinarity and transdisciplinarity: *is it possible to metaphorically-mathematically join interdisciplinarity and transdisciplinarity?* Under these circumstances, trandisciplinarity, considered to be a formal operator, may be applied to interdisciplinarity and, at the same time, we may remark its character, situated "beyond" the borders of interdisciplinarity, as well as its integrative wholistic aspect. In the future, we will strive to answer that question and we will insert the answer into the IUITCS site.

Bibliography:

1. Martin Heidegger, *Science and Reflection*, 1954, pp. 155-182;

2. Julie Thomson Kleine, *History-Theory-Practice*, 1990;

3. Jan C. Schmidt, *Towards a Philosophy of Interdisciplinarity*, 2007.

Interdisciplinary and Transdisciplinary Aspects Existing in Complex Systems Identified in the Results Granted the Nobel Prize in 2024

Sorin Baiculescu[1]

General introduction (references to the Nobel Prizes 2024, to the reasons for granting the former)

In the period 2nd – 9th October 2024 the Nobel Commitee *(in Sweden: Royal Swedish Academy of Sciences din Stockholm – the institution designed to grant the Nobel Prizes for Physics, Chemistry and Economy; Karolinska Institute in Stockholm – institution designed to grant the Nobel Prize for Medicine and Physiology; The Swedish Academy in Stockholm – institution designed to grant the Nobel Prize for Literature and Norway: Norwegian Nobel Committee, Nobel Peace Prize – Norwegian Nobel Institute in Oslo – institution designed to grant the Nobel Prize for Peace)* presented the Nobel Prizes for the year 2024. Those were granted for the following domains: Physics, Chemistry, Medicine and Physiology, Literature, Peace, Economy *(a prize funded, since the year 1968, by the Central Bank in Sweden (Sweriges Riksbank in Stockholm))* granted by the Royal Swedish Academy of Sciences in Stockholm. The structure is described as follows, for the year 2024.

Physics

John J. Hopfield (Princeton University, USA); Geoffrey E. Hinton (University of Toronto, Canada).

Reason: "For foundational discoveries and inventions that enable machine learning with astificia neural networks".

Chemistry

Demis Hassabis (Google DeepMind, USA); John Jumper (Google DeepMind, USA); David Baker (Washington University, USA).

[1]President of International Union for Interdisciplinarity and Transdisciplinarity in Complex Systems (IUITCS), the Romanian Committee for the History and Philosophy of Science and Technics (CRIFST), Division of Logic, Methodology and Philosophy of Science (DLMFS), the Group for Interdisciplinary Research (GCI) – The Romanian Academy, Société Française de Philosophie (SFP) - associated member.

Reason: “For protein structure prediction (Demis Hassabis and John Jumper) and for computational protein design (David Baker)”.

Medicine and Physiology

Victor Ambros (Dartmouth College, Harvard University and University of Massachusetts, Chan Medical School, USA); Gary Ruvkun (Harvard Medical School and Massachusetts General Hospital + MIT, USA).

Reason: “For the discovery of microRNA and its role in post-transcriptional gene regulation”.

Literature

Han Kang (Art Institute in Seoul, South Korea).

Reason: “For her intense poetic prosethat confronts historical traumas and exposes the fragility of human life”.

Peace

“Nihon Hidankyo” - a Japanese organization in Tokyo. .

Reason: “For its effort to achieve a world free of nuclear weapons and for demonstrating through witness testimony that nuclear weapons must never be used again”.

Economy

Daron Acemoglu (MIT - Simon Johnson Sloan School of Management, USA) and James A. Robinson (University of Chicago, USA).

Reason: “For studies of how institutions are formed and affect prosperity”.

The Nobel Prizes (Nobel medals and diplomas) are effectively granted to each laureate, by the King of Sweden (Physics, Chemistry, Medicine and Physiology, Literature), always at the same date of the year – 10th December –, in “Stockholm Concert Hall” and – according to the same principles – by the “Royal Swedish Academy of Sciences” in Stockholm (Economy). On the same day, in Oslo (Norway), in “Oslo City Hall”, is held the ceremony of granting the Nobel Prize for Peace by the “Chairman of the Norwegian Nobel Committee”, in the presence of the King of Norway. In 2024, there were eleven Nobel laureates, eight of them from the USA, one from

Canada, one from Japan and one from Soud Korea. Each one, as per the Nobel statutes, has he right to have a single "Nobel lecture", referr. to the subject for which they were granted the distinction[2].

Abstract

In the following text, there are comments for each of the fields mentioned in the introduction, the significancies of the subjects for which were granted the Nobel prizes in the year 2024. In the second part, there are references to interdisciplinary and transdisciplinary aspects existing within complex systems, which also include the results granted the Nobel prize, for the respective period.

In the context, are put into light the importance and their perspective, in relationship with the border and futurist disciplines. It is useful to remark, when putting those aspects into light, the structure of the expertise of the Nobel Committee (specially) created with a view to identifying the Nobel distinctions granted in 2024.

Physics

Within the Artificial Inteligence (AI) the algorithmic optimization, as well as the modeling of the AI processes are important, the latter ones being similar to those inspired by human cognition. Concerning this trend, a significant role is played by the probabilistic and statistic forms existing in mathematics, as well as in statistic physics. The advantage of using such forms is useful in the architecture and building of complex systems which self-instruct (within the frame of artificial networks) out of data collecting (the Big Data system) and then include the latter into different patterns. The networks introduced by John J. Hopfield (which took his name) are inspired by the proceses specific to associative memory of the Human Being (also studied in "neuroscience"). The process of modeling will take place: the basis will be statistic physics and the collected memory pattern will be associated to the minimum energy of the modeled complex system.

Within a Boltzmann distribution, by means of theories in statistic physics, it is possible to check the stability of those network forms, which mostly depend of their energy. The training of neural networks (without using supervision) is realized by menas of the so-called "Boltzmann machine", where Boltzmann (probabilistic) distributions are used in the training of neuronal networks. Modeling also implies simulations of state transitions (of the nwworks) which, in the analyzed

[2]For the mathematical sciences, the equivalent of Nobel is represented, since the year 1936, by the Fields Medal granted by the "International Mathematical Union".

framework, will identify essential structures existing in the entry data which the Human Being, in natural conditions, cannot determine. Thus, takes place the optimization usable in determining the optimal configurations of complex systems. Automated learning ("machine learning"), as a process resulting from the interactions existing among the artificial neurons, will become possible. In the context, emergence[3] may also occur, as specific to the complex systems with networks (the Hopfield form). Such networks are useful in biology (the prediction of the structure of proteins by means of the AI), the recognition of forms, neurolinguistics (recognition of talk), the growth of the algorithmic processes speed (in general) and obtaining their efficiency. We would like to mention that Hopfield has important scientific developments in statistic physics, complex molecular biological systems and "neuroscience" + A (artificial neuronal networks) and Hinton has developments in AI, the "machine learning" obtaining, "the Boltzmann machine", in developing technologies based on AI. We remark the necessity of an interdisiplinary approach, but also a transdisciplinary one for the wholistic analysis of scientific issues specific to the XXIst century, which are to be further presented (in detail) (referring to the debated subject matter).

The result of the research granted with Nobel-2024 will determine remarkable interdisciplinary, but also transdisciplinary scientific implications existing within complex sytems.

We should remark some connections, first from the interdisciplinary point of view: a) the scientific interdisciplinarity existing within cognitive disciplines, considered in biology (the functioning of the Human Being's brain, as well as of the latter's neural connexions), statistic physics (the Boltzmann distribution and the Boltzmann machine), as well as in informatics (automated algorithmic learning and data analysis), in the sense in which neuronal networks in AI have the possibility to learn progressively, to keep and memorize the concluzions obtained out of a diversity of patterns, generally mathematical ones, at the same time, taking over the latter's patterns; b) the applicability in the research achieved within the European Centre for Nuclear Research CERN in Geneva ("Large Hadron Collider" (LHC)) referring to cosmic particles and subparticles; c) eliminating some possible cosmic "perturbations" (named "noises"), which may occcur with the perception of gravitational waves, already identified (thoretically provided by Albert Einstein and effectively registered, by a performant assembly achieved in the USA (functional), awarded the Nobel Prize for physics in 2017; d) the applicability in optimizing the dynamics of complex and bio-complex systems; e) optimizing the identification of the objective functions (operational research - in mathematics); f) major scientific opportunities in the general recognition of forms, as

[3] Sorin Baiculescu, *Emergence*, NOEMA XIV, 2015, Academia Română.

well as in that pertaining to the the recognition of facial forms. We should mention that the concept of free energy is also used, which, in fact, comes out from (thermodynamic) physics, which may be used in generating some statistic patterns (self-learning and adaptability of behaviours generated by data). In order to obtain some probabilistic patterns, in the above-mentioned sense, it is also used the probabilistic modeling, as well as the Bayes modeling.

Two – from the transdisciplinary point of view: a) the transdisciplinary tendency existing in the future-technological and bio-technological connecting of the wholistics of the majority of current disciplines, as well as the new ones[4], applicable within a (possible) scientific whole. Which can be situated (perspective) over classical knowledge (in physics); b) the analysis of current results (currently achieved at theoretical and intuitive levels) referring to the difference between Real and the reality of the Human Being (by means of the symbolic and imaginary components (the Borromean regions)) to the "hard" issue referring to human consciousness (David Chalmers – 1995), to the components of scientific information (statistic, syntactical, semantic, pragmatic and apobetic – Wernner Gitt opinion), in the (AI) study of natural linguistic forms proper to the Human Being and to certain animals (neuro-psychological aspects of the latter) to the analysis of some forms of natural forms of intelligence and automated learning, to surgery robotics (the medical domain), to achieving autonomous vehicles, to their intelligent "routes"; c) by means of the scientific transhumanism, onw may also explore the "borders" of natural intelligence existing as compared to artificial intelligence, as well as to the generative artificial intelligence; d) the prospective identification (AI modeling) of essential data delivered by the ‚Big Data" system; e) discovery of non-identifiable "patterns" by the Human Being in their natural conditions, but identified/identifiable in an automated way, by means of AI; f) identification of data referring to climate changes (existing in that period), first of all, generated by certain cosmic natural forms, including the earthly and solar magnetism, being forms within which, unfortunately, we are included, likely to similar phenomena deployed in Nature, in time, in other periods proper to the cosmic universe described by history. We should remark the fact by means of which, in a transdisciplinary sense, may occur the concept of 'transdisciplinary pattern", introduced/exemplified in other paper in Journal 2.

Chemistry

The Nobel Prize 2024 for chemistry was awarded for the remarkable results obtained in the biochemistry field. Those results referred to proteic structures (chains of aminoacids) as a

[4] To consult, also, the UNESCO classification of current and newly-occurred disciplines, to be found in the annex to Journal 1 of IUITCS, inserted in the site of the Union.

"computational design"; thus was generated the creation of some proteic forms, by using algorithms, and the results are useful in producing medicine. By using the artificial intelligence, was precisely determined the 3-dimensional proteic structure, which is important in order to identify in an exact way the functions of proteins, considering the sequence of the latter's chain of aminoacids. The results become mostly useful to structural/molecular biology. In fact, from now on, proteins can be obtained by an artificial method. Thus, have been founded the bases of a new specific bio-technology, named the AlphaFold pattern. The results are included within the "Complex Biological (molecular) Systems", which also clarifies the subject matter of "flexion of proteins in different 3-structures".

Interdisciplinary scientific aspects: the results were possible following certain interdisciplinary connections coming from the structural (molecular) biology, biochemistry and artificial intelligence.

Transdisciplinary aspects: the newly-obtained results are beyond the possible limits of classical disciplines, such as biology and biotechnology, medicine, classical physics and structural chemistry, geometry, mathematical statistics and topology, due to the new achievements of the "deep learning and AlphaFold" form (informatics), in the first place, useful when investigating certain major genetical defficiencies. By means of gene editing, made possible by the already existing technique - CRISPR-Cas9 (genetic editing - Nobel Prize in 2020), one can oversee the transdisciplinary association with the AlphaFold technology; as a perspective, the two will complete each other, generating still a new paradigm in bio-sciences.

Medicine and Physiology

In conformity with the theories existing within cellular biology, which is connected to genetics, will take place a process of tailoring the activity of genes, whose principle was put into evidece by means of the achieved research, which was awarded the Nobel Prize in 2024. Cells, by their diversity, being base entities of the living structures, are using, in different ways, the genetic information of cromosoms, and have as an "aim" to activate or deactivate certain genes. When the correct activation is influenced by some pathologic cellular processes, some genetic disfunctions in health may occur, including human health. Such aspects are generated by the micro-RNAs that regulate the way genetic manifestations (expressions) take place. For instance, it is to be remarked that, with the elderly people, neurogenerative affections are triggered by the malfunction of the micro-RNA, stopping or blocking certain genetic messages to be transmitted correctly to proteins.

Within this frame, will be generated/perfected new personalized theories, since one can clearly understand/descipher the mechanism by means of which will intervene that genetic structure.

Interdisciplinary aspects: In order to obtain the results of the study awarded the Nobel Prize in 2024, there has been a crossroad of the theories of cellular/molecular biology with those of genetics (tailoring of gene activity), and there are influences upon the cellular activity of the living structures. Since the DNA and the RNA should be split into sequences, in order to identify the micro-RNA structures, were used/applied methods proper to biological informatics, as well as to biotechnologies necessary to achieve the splitting into sequences.

Transdisciplinary aspects: the placing beyond the limits of certain classical scientific disciplines; a) molecular biology and cellular physiology, genetics (tailoring the cellular activity); b) the placing beyond the borders of biological amd bioinformatic disciplines; c) the occuring of new medicine which may represent a solution for a series of genetic disfunctions; d) new bioetical aspects, placed beyond classical (previous) borders.

Literature

The issue mind-body – in fact, connected to the subject-matter of the Nobel Prize 2024 for literature – even if there is no direct reference to that – was explicitely analyzed by the French thinker, philosopher and mathematician René Descartes ("res extensa - res cogitans"). That issue had been present since ancient times (body-soul in the Greek philosophy (Plato – "Phaidon", Aristote – "De Anima")), up to Augustin, and Toma d'Aquino. That issue still exists, in the present, but it is connected to consciousness transformed – as an expression, under the form of a so-called "hard" issue, by the Australian philosopher David Chalmers (formulated in 1995). Descartes considered that the soul (immaterial mind) is completely separated and different from the body (which has only material components). We may ask the fundamental question: can the body have an interaction with the mind, since they both are composed out of different entities? and by means of the "hard" issue (also named "of the consciousness"): how can be explained the fact that an ordinary form (physicalistic), simple-material (the brain of the human body), it may generate a subiective entity, named "qualia" (pertaining to subjective thinking), in fact, of the consciousness (that of the mind associated, in a way, to the soul, too). To that (fascinating) issue, a current discipline named "neuroscience" is also trying to give some answers; the explanations of the latter being strictly

materialistic, at a distance from a certain finality, and mostly based on the results of modern medical investigations, such as tomographic ones; however, those ones, under certain reserves, cannot be totally taken into consideration from the scientific point of view. In this sense, the subjective "turmoils" of the human soul still have a place well determined from the psychological point of view: they are admirably described under the form of certain "sensitivities" and "vulnerabilities" of the Human Being by the South-Korean writer and esseist who was awarded the Nobel Prize in 2024 – Han Kang. In fact, the subject-matter of the Nobel Prize 2023[5] awarded to a well-known Norwegian writer (Jon Fosse), also referred to some strictly psychological (or neuropsychological) issues proper to the Human Being, even pathological of the latter's "qualia", described in literature. One may also make a connection to the human "imaginary", as well as to Freud's psychanalysis. Han Kang wrote a book named "Vegetariana" (there a "shift", a "transformation" of a Human Being into a tree is taking place, in fact, an aspect considered by the author as a sort of "refuge", an "exit" out of the human reality (not out of the Divine Real (the Borromean regions)). As far as psychanalysis is concerned, we remark the fact that one can make profound connections to the unconscious (where, most times, we can find the existence of unsatisfied desires) and to certain forms of "symbolic" which (by means of its attributes), is supporting the Human Being, all over their existence. In the book "Human Acts", are underlined the psychological trauma generated by a military conflict in South Korea (Gwangju – 1980). The style of the South-Korean writer is characterized by "symbolism"; then as we already mentioned, the existence of some minimal forms of langauage, but also of silence, with a very powerful "emotional complex", the connections of the profound literary and poetic combination, similar to that between the art of music and the visual art. We may also remark the books "The White Book" (the relationship between life and death), "Your Cold Hands" (alienation and identity), "Love in Yeosu' (the existence of emotions).

(Approximative) aspects of interdisciplinarity: a) the interrogative-metaphysical "word" (with transcendent aspects) of the relationship mind-body (soul) between existence and bioetics (existentialist philosophy and morality in biology); b) the "symbolistic" of the Human Being in relationship with Nature; c) the study of the extreme psychological and existential limits of the Human Being (for example: "Vegetariana"); d) the non-achievement of the Human Being (by means of their body) faced to society; e) the analysis of suffering, trauma and alienation, from the "angle" of psychological introspection; f) the aesthetics of the white colour (a methaphoric image) to put into evidence purity; g) historic and sociologic descriptions; h) poetic art.

[5] To see also, the references in Journal 1/2023 of IUITCS concerning the Nobel Prize 2023 for literature, to be found on the site of the Union.

Transdisciplinary aspects: a) transcending the borders of interdisciplinarity (the possible composition of transdisciplinarity with interdisciplinarity; b) wholism of the Willard Van Orman Quine form; c) the death issue; d) the rerelationship of the human body with the spiritual; e) memory, as well as the psychology of colectivities; f) the harmonious connection of philosophy to psychology; g) the exploring of silence and of the complexity of simplicity; h) the transcending of the classical limits of knowledge.

Peace

The Japanese Organization "Nihon Hidankyo", with its headquarters in Tokyo, includes survivors of the American nuclear attacks in Hiroshima and Nagasaki, the people called "Hibakusha". Following those tragical situations, very few people in the respective region stayed alive. Currently, the Association is militating for the irrepetability of such human tragedies. Our opinion is that any one who may curently menacing with possible nuclear attacks, knowing what happened in Japan, do not comply to any humanitarian, moral or ethic norms; in the international (nomal) community are not accepted any forms of justification, including false "patriotic" ones (hypocrite, fanatic, irrational) and not at all patrotic.

Interdisciplinarity: a) science (connections between nuclear physics and atomic radiations, among physics, chemistry and mathematics), technology (discipline of materials and advanced techological assemblies); b) history (social and nuclear); c) psychology (psychological traumas generated by the war and a possible nuclear war); d) sociology (social trauma); e) international law (international treaties concluded for the nuclear desarming); f) ethics and bioethics (morality in biology); g) philosophy (relationship between social security and social protection + militarism).

Transdisciplinarity: generally speaking, it doeesn't exist, in this case.

Economy

It approaches some issues of related to the existence of specialized institutions (industrial, performant in IT or with another structure), necessary in order to ensure the prosperity of a nation, by its development/growth. Out of that "angle" are analyzed also the historical-colonial periods which mostly determined the pauperization of the respective nations.

Interdisciplinarity: a) rconomic and econometric patterns (mathematical modeling in economy) of prosperity; b) history and the economic impact of colonialism; c) cultural anthropology and the cultural impact related to economic growth; d) individual psychology and crowd psychology related to economic developments, with an impact on the growth of prosperity; e) wholism existing in the analysis of the economic determining of prosperity; f) political influences in the growth of the prosperity of a nation; g) bioeconomic systemic complexity existing in the growth of prosperity.

Transdisciplinarity: a) intensive growth of the prosperity of a nation, by continually placing at higher and higher levels from the economic point of view, passing beond the previous “borders”; b) the study of some economical aspects that imply global growth of prosperity (for example: the studies of the Rome Club); c) ensuring new perspectives of science, necessary in the development of huam societies.

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MEANINGS OF NATURAL PERCEPTION BY THE HUMAN BEING

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Abstract

In the present paper, we analyse certain scientific aspects related to the complexity of systems, as well as to the theory of cognition, methaphysics and science philosophy. The result represents a "contingency" with issues concerning the complexity of social systems associated to the psychoanalysis ones and methaphysics, influenced by religion in its different "nuances" and having differrent interdisciplinary scientific "tendencies", and significant existencies in epistemo- logy, philosophy, a.s.o. The exterior world is a product of our perception. Pure mathematics – the form of the absolute, independent of the empiric models, can build the universally true results only mentally, irrespective of the spaces they are in. Gauss – Riemann – Lobacevski geometries have inner coherence (Henry Poincaré) and it is possible to apply them to some "real" world, probably different from what the human being perceives and which the human being can consider as virtual, according to its system of assessment. Absolute time becomes "flexible", its extension or contraction describing the speed cosmic phenomena in the Universe are achieved with. The basis of mental procedures leading to «truth » resides not only in the procedures of a certain formal system (Kurt Gödel theorem of incompleteness). Stochastically, ancient dualistic philoso- phical concept (Aristotel) is implied.

Keywords: Methaphysics, Philosophy, Science

In his last book, "Out of this World, Other Wordly Journeys from Gilgamesh to Albert Einstein", Shambbala Publications, Inc. Boston & London, 1991, Ioan Petru Culianu was referring to the conclusions of certain Gallup soundings, according to which 94 % of the Ameri- cans believe in God, 67 % believe in life after death, 71 % believe in the existence of Para- dise, 29 % could see Paradise, 53 % believe in the existence of Hell.

The result represents a "contingency" with issues concerning the complexity of social systems associated to the psychoanalysis ones, methaphysics, influenced by religion in its different "nuances" and having different interdisciplinary scientific "tendencies", and significant existencies in epistemology, philosophy, a.s.o.

The symbolic meaning of "paradisiac" knowledge(extensively-intensive,"horizontal") and the "luciferic" one (extensively-intensive,"vertical") is generated by the meaning of the direction taken by the development of "phenomena" within some profound coherences of understanding the "meaning".

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Simultaneity generates creative explorings, while the profoundness of revealed non-knowledge minimizes the human being as concerns stochastic knowledge, asymptotic knowledge of the paradisiac or luciferic level. Pure absolute phenomena have certain implications in the "relative", since they universally operate in a dual way.

Psychoanalysis also examines thinking issues, cognition issues generated by the unconscious.

In the "Stanford Encyclopedia of Philosophy" by N.F.Zalta, Paul Thagard maintained – in the section on representations and computations – that thinking can be understood in terms of the representational structures and of the computational procedures processing the former. The Brentano problem consists in the existence of the mind universes having a content in the sense of intentionality. One may believe one could have seen a world that one could imagine, while that world may not exist in the pysical, limited "space" = the bio-received "space". The mental "space" - which has a psychologic nature - is different from the limited "space", therefore mental universes can create n-dimension images, which are impossible to be perceived in the limited trivial "space" usually (naturally) bio-received by the human being. The latter can sometimes imagine certain "symbols" generating images that psychologically reflect a resemblance to the substantial (pysical) appearance, in the way it is operating in the topology (geometry) of the trivial (E3 - Euclidian) perception, endowed with auxiliary, complementary qualitative characteristics, generally having a superior/inferior "moral"; those images contain positive/negative apects (psychoanalysis applied to fairy tales) probably sprung from the unconscious and "covering" the interval between malefic and ineffable (sublime); one might choose to analyse those images by means of fuzzy sets (vague multitudes), taking into consideration one's choice, one's vision, the respective epoch, the respect tive civilization, a.s.o.

Psychoanalysis applied to fairy tales (the tendency of the human being becoming or aspiration), applied to mythology, to religious confessions, to education – are some examples existing all over the symbolic bio-received "space".

The exterior world is a product of our perception. Pure mathematics – the form of the absolute, independent of the empiric models, can build the universally true results only mentally, irrespective of the spaces they are in. Gauss – Riemann – Lobacevski geometries have inner coherence (Henry Poincaré) and it is possible to apply them to some "real" world, probably different from what the human being perceives and which the human being can consider as virtual,

according to its system of assessment. Absolute time becomes “flexible”, its extension or contraction describing the speed cosmic phenomena in the Universe are achieved with. Together with time, the curve space forms a 4-dimension system, which can better explain the macrocosmic universe, while the non - Euclidian geometry invalidates the Newtonian concept. Within the microcosmos, however, there are: the “ideas”, the “meaning”, the “phenomenology”, the “information”, the “cuantic gravity”, the “space–time pair”, which are all different from what has been known to us; another “image” of the former is “true”, more concept-based, connected to another type of reception, which probably exists “within” fundamental particles (current correlation agreed to exist among Buddhism, Christian religion, science) and different from the habitual one.

In “The Meaning of Relativity”, Princeton University Press,1955, Princeton, New Jersey, Albert Einstein concludes: “…the theory depicted here is the simplest relativist theory possible from the logical point of view. This does not mean nature cannot be submitted to a more complex theory of the domain… One can find well-founded reasons for the fact that reality cannot be represented by a continuous domain. Out of the cuantic phenomena seems to result that a finite system of finite energy can be fully described by a finite range of cuantic numbers. This seems not to be in accordance with a theory of the continuum and consequently, it should lead one to try to find a purely algebraic theory in order to describe reality. On the other hand, no one knows how to obtain the basis of such theory”. In terms of the above-mentioned point of view, the concept of “limited physical space” is epistemologically justified.

Epistemological theory considers the world perceived by the human being as a variety of a more profound, many-sided-structured world, which does not fully penetrate our representtation. The possible dimensions of the « Transcendent » (Buddhism), of the « Pure Reality », of the « Thing-in-Itself » (Immanuel Kant) bring at the knowledge level the infinity, «paradisiac spaces» probably ‘’lighted’’ by Divine love and wisdom, guide marks of an infinite God, capable to create a sublime world in its perfection - maybe Dante’s world, as he was guided in his roving through Paradise by Beatrice, a symbol of Divine Wisdom and benevolence. In such worlds, religious spirits can find satisfactions which are complementary to those pertaining to perceived existence, since in “hyperspace” the wordly loss of the human being has one more “meaning”: while the soul is separated from the body, the existence of certain sub-spaces allows one to locate it. The masterpiece entitled “Divina Commedie”, written by the poet Dante Alighieri during the period [1306-1321], represents a universal aleadmirably reuniting many elements of applied psychoanalysis, identified at a global level as a complex system (social, confessional,

educational,philosophical, mythological, literary, semiotic, mathematic, stochastic, a.s.o.), in an integronical sense.

Ioan Petru Culianu assumes that each and every human action is developping in certain Hilbert n-dimensional spaces limited by norms. The “Passing away” probably repesents the « transcendence » within a non-material, a-spatial, a-temporal informational existence. In his “Morphology of Religions’’, Mircea Eliade sees the tendency towards the concrete as “the getting out of the profane, insignificant, illusory experience man is living in, until he decides to obtain his liberation; only the sacred zone is truly real, while everything beyond the sacred zone is short-lived, insignificant”.

The divine is dominating by means of the “absolute”, the human being able to “asymptotically” transcend towards the knowledge of the former through meditation, contemplation, mystical physiology; there are several such procedures based on a “profound” psychoanalysis.

All those facts lead to the idea of possible mathematical dimensions of the absolute, or even symbolic ones, generating universal equilibrium to be found at different levels of expression of the human being.

In trying to describe “spaces” of superior dimensions, the well-known example of the 2-dimensionality versus 3-dimensionality, is highly susggestive. Hypothetically, the 2-dimension world comprises flat beings, fully examinable by beings existing in a “space” that has one more dimension. The latter is not to be understood by the flat « universe », except for maybe a few “fascicles” of its existence. Intelligent flat beings sharing some knowledge of n-dimensionality would undestand the 3-dimensional world in a relative way, while its full meaning would still remain inaccessible.

Extrapolation is evident.

For beings living in the (n-1)-dimensional “space”, the n-dimensional “space” would seem to belong exclusively to « gods », and the latter would be able to fully subordinate the former. The process represents a « miracle » for those having one less dimension, or having another way of understanding how “real” existence” of the Macro/Micro-Universe “is Functioning”.

The basis of mental procedures leading to «truth » resides not only in the procedures of a certain formal system. Irrespective of the algorithm (Kurt Gödel), the sentence $P_n(n)$ cannot be validated within the respective algorithm when it takes place in a complete axiomatic system of an arithmetical order (theorem of incompleteness).

Human mind seems not to be algorithmic in a holistic sense. This probably represents the universal "interdiction" for the fact that (n-1)-dimensionality cannot imagine the n-dimensionality within an absolute relationship. Ivan's speech delivered to his brother in "The Karamazov Brothers" (Dostoievski –1878-1880) is depicting the former's perception of the Divine Universe: "Please, understand me well, it is not God I'm not accepting, but the world He created. I do not accept God's world and I refuse to accept it. Allow me to put it in a diferent way: I have the strong belief of a child that wounds will be healed and scars will disappear, that the whole comical and offensive show of contradictions will vanish into thin air, like a poorly-achieved mirage, like a horrible and loathsome invention of the weak and insignificant Euclidian human mind… Should parallel lines ever meet and should I see that with my own eyes, I would declare they have met, but still will never accept it". The "Divine Universe", the "Pure Space ", the truly "Real ", "Ineffable" one surpasses our capacity of understanding, just like non-Euclidian spaces surpass the capacity of understanding of the above-mentioned literary character.

The "Voyage" to such a « world» implies exploring certain mental universes, possibly a certain "mental exercise", since the mental "space", unlike the limited, pysically-received "space" (also called the sensitive "space") can enjoy the n – dimensionality or a certain "symbolistics", which, however, it cannot substantially, consciously interpret, in the sense of psychoanalysis.

From the mathematical point of view, there might be an n - dimensionality world.
$E^n = \{(x^1, x^2,\ldots, x^n) | \; x^k \in E \; , \; k = 1, 2, \ldots, n\}$, (regular systems of "n" dimensions), can be structured. Certain differentiable forms can be associated to an (n+1) – dimensional "hypersurface".

From the mental point of view, "spaces" included in E^{n+1} can be associated to a certain multitude (mathematically, psyhologically, psychoanalitically (the Jacques Lacan topology referring to the three "TORs" which represent the inter-clasping, symbolic, imaginary, real "space")); their co-existence can be demonstrated. The geometry of differentiable varieties and of the attached multifunctions, of differencial algebraic forms, in relationship to multivariables they depend on, stochastics and even probabilistic metaphysics all stand as a proof: they represent

scientific structures developped within « spaces » with different “profiles”, with certain “images”. In probabilistic “spaces”, the microuniverse is “hidden” in small infinites, and particles are in some oscillatory motions of a continuous vibration around some relatively balanced centres. For a more “suggestive” analysis, Academician Mihai Draganescu also refers to the possibiliy of associating a “wave” to the brain of the human being-a procedure similar to the one used in the study of corpuscular and ondulatory aspects of light.

Some maintain that the macro-Universe (the visible universe (within certain limits)) is but a convention based on our perception, while real worlds lie hidden deep within the laws of micro-Universe. The universality of absolute phenomena implies the existence of some forms which are superior to substance and energy, the law being probably generated by the triad (information – energy – substance), by the fundamental quantum of information. Somehow, this is another “association” to the Jaques Lacan fundamental triad concerning the “psyhoanalitical space” with its well-known “limits”. One may assume the quanta of information are capable of superluminic speeds, the energetic and substancial matrix being predetermined by information (sometimes biological). The resonance of the information, energy and substance codes implies direct access of ideal systems to quanta of information and to their multidimensional configurations, and there are holistic couplings related to configurations of the human being neural network. In this way, processes of psychic reflection and perception might be generated by the flows of quanta related to stuctures; those flows evolve between the “space” reflected in the unconscious mind and in the conscious mind.

Pure phenomena are implied in the relative, they are universally functioning in a dual way. 3 – dimensional forms represent relativist mathematical directions, “plungins” into the absolute. They configurate the “sizes” Sigmund Freud was referring to when he was speaking about the “ocean feeling” concerning the religious belief of the human being “built” - from the substantial point of view - in a tridimensional Euclidian way. Stochastically, ancient dualistic philosophical concept (Aristotel) is also implied.

There is a pointing out of the structure, a metamorphosis of the quantitative into the received qualitative. The Absolute becomes received esthetic, in proportion in which the relative is emphasiezd or revelation induces metaphysical introspections of the pure universe. Merston Morse identified links at a psycho-spiritual level that metamorphosize into received esthetic.

Edgar Allen Poe was assuming: “… Let us examine a crystal. We are at one interested by

the quality between the sides and between the angles of one of its faces: the equality of the sides pleases us, that of the angles doubles the pleasure. On bringing to view a second face in all respects similar to the first, this pleasure seems to be squared; on bringing to view a third it appears to be cubed, and so on. I have no doubt, indeed, that the delight experienced, if measurable, would be found to have exact mathematical relation such as I suggest, that is to say, as far as a certain point, beyond which there would be a decrease in similar relations."

The Golden Section (the Golden ratio $(1+5^{0,5}) / 2$) and the Fibonacci series ($x_n = x_{n-1} + x_{n-2}$; $n \geq 2$; $n \in N$) stand as a proof. Fechner demonstrates the esthetic optimum generated by its existence, the Renaissance considers it divine through its capacity to generate harmonious proportions, sculptors identify its capacity to produce esthetic proportions, architects consider it as a guide mark in achieving buildings, biologists consider it the "number of life", musicians – "a basis in generating sounds". As a measure, when getting closer to it, harmony is generated, while when getting farther from it, asymmetry is generated. The optimal angle ($137^{o}30'28''$) of incidence of light rays, together with the golden number represent the secret of the ideal, liniar-angular balance.

There is a measure of the esthetic, probably present in the unconscious of any human being.

In a work of art, the"Rhythm" identifies with itself (the way Saints are placed in the paintings with iconographic subject, the succesion of motives specific to decorative arts, the geometrical development of sound in Johann Sebastian Bach's organ concerts, the pathos of Ludwig Van Beethoven's symphonies).

An analysis of the way of combining the elements of a work of art implies obtaining a model, which, in terms of esthetic value, probably exists inside of any artist's soul, thanks to whom the Universe can be put into evidence or can be revealed. Fractal increase, chaos,
catastrophes, multi-shaded universes of fuzzy (vague) multitudes, the continuum, the discreete, stability, bifurcations represent only some of the current trends in mathematics / philosophy, as well as in the study of biocomplexity. Fractal analysis of nature's varieties generates the latter's virtual universe. Lyndenmayer algebra establish some algorithms that introduce a new formalism for re-modelling and stimulating the development of multicelular organisms, and computational methods lead to next-to-perfect results (Aristid Lyndenmayer – Developmental models for cellular interactions in developments, Part I, II, Journal of Theoretical Biology, 1968). Mathematical chaos is not synonimous to absolute disorder. Geometrical structures describe the behaviour of chaotic

systems. They limit prevision, while generating, on the other hand, causal relationships we otherwise cannot imagine. The behaviour of a system in the universe perceived by the human being is apparently aleatory.

Hazard, probability and necessity represent some of nature's options and are achieved according to laws man only partially understands. The diagram of bifurcation sketches the transition of a system towards chaos, and attractors of the system are organized accor- ding to the expression $x_{n+1}= \omega + x_n + (k / 2\pi) \sin (2\pi x_n)$, k – control parametre. The model allows one to study the transition towards chaos for a system characterized by two frequences whose ratio is ω. Catastrophes (discontinuities of nature) point out to non-liniarity, non-symmetry, paradoxes.

Could the above-mentioned be identified as possible "transitions" of the Universe towards other "forms of existence"?

Mathematics has imagined methods to gradually estimate contextures. The level can be "multi-shaded", fuzzy (vague) multitudes being the ones to be applied. Nature can be quantified in terms of some relative systems of assessment. Paradise, as it is psychoanalytically perceived by the human being can be wonderful, beautiful, less beautiful, …; the quantification in the interval [0,1] of the adjectives through which it can be described may be characterized by measuring the level of "polarized esthetic emotion", a "felt" measure of perception. Moreover, that analysis can be made using some methods pertaining to linguistics and generative grammar (Noam Chomsky), cultural anthropology (Claude Levy-Strauss), semiotics, genetic epistemology (Jean Piaget), genetic algorithms (artificial intelligence) a.s.o. Does the "Pure Space" of the perceived relative repesent the real "sense" the absolute is implied in? Can the absolute form perceived by the human being in its relative system be correctly assessed from the Euclidian point of view? Probably not. Stochastically, all the above represent questions "for the future", and psychoanalysis, complexity of systems and cognition should bring their respective contributions to answering them.

To conclude, we shall put into evidence a possible interdisciplinary trend we have imagined as existing between psychoanalysis and the theory of systems (Annex 1 / formal mathematical model). We also submit the apologetic model "built" upon an interesting presentation - delivered by the Priest who had been invited to an interdisciplinary symposium - in order to explain the way the Cristian Church understands certain concepts of informational preception (Annex 2).

According to that presentation, the Christian outlook maintains Paradise and Purgatory (Hell) do not simply represent an illusion, those "spaces" really exist. Different arguments have been submitted and supported by some examples."Divinity",the "Fundamental Consciousness» (Mihai Dragănescu / answer to the question asked by Constantin Noica) surrounds with love those arriving in the "Pure Space", as well as those arriving in the Purgatory (Hell); however, while those who are in Paradise can perceive Divine Love, those who are in Purgatory cannot realize it. There is a certain cancellation of the informational perception "channel" of love because of the non-observance – during their lifetime – of the Divine Knowledge. By achieveing an image of the described system, one can set off a "stochastic law" of the system's functionning, as briefly described below.

The non-observance, during one's lifetime, of the norms reccommended by the Divine Knowledge triggers one's ulterior "informational", non-substantial, a-spatial, a-temporal "placing" within zone 6; on the other hand, the observance of those norms triggers one's "placing" within zone 5.

The Ω point marks the border between the two.

Formal mathematical model:

Notations are $\sum = (T,U,\Omega,Ipsi.,Y,\Gamma,\Phi,\Lambda)$ (1), its components being the following:

T-multitude of values of the variable time t, related to the conscious system ($t \neq 0$) or unconscious system ($t = 0$);

U-multitude of values of u entry variables described by the class of functions $\Omega=\{\omega:T\rightarrow U\}$ (2), where:

$\omega =\{u(t)|t\in T,u(t)\in U\}$(3) represents the evolution of entry variable accepted by the pshychic conscious sub-system ($t \neq 0$) or unconscious sub-system ($t = 0$), and u represents the value at a certain time ($t \neq 0$; $t = 0$) of the function ω;

Ω-class of functions of the multitude of values of entry variables accepted by the system, by components and instances (conscious mind, pre-conscious mind, unconscious) / (super-ego, ego, self);

Ipsi.-multitude of values of satus variables marked with i;

Y-multitude of values of exit variables described by the class $\Gamma=\{\gamma:T\rightarrow Y\}$(4);

Φ-transition function of the considered system ($\Phi:TxTxIpsi.x\Omega\rightarrow Ipsi.$)(5),where $i(t)=\Phi(t,\tau,i,\omega)$ (6);

Λ- exit function $\Lambda(t)=\Lambda(t , i (t))$ (7) where $\Lambda:TxIpsi.\rightarrow Y$ (8)

We note by $\omega_{\{t1,t2\}}=\omega\,|_{T\cap(\{t1,t2\}}$ (9) the restriction representing the entry segment, ω-evolution of the entry variable accepted by the system;

$T=\sum\cup[t_i,t_{i+1})$ (10) for i = 1,n ; where $[t_i,t_{i+1})$ – segments related to the structure of the time horizont.

The system of differential equations will have the following general form:

$dIpsi.(t)/dt=f(t,Ipsi.(t),u(t))$ (11), vector $u = (u_1,u_2,\ldots,u_m)$ (12) represents the control variable and the order is represented by the measurable function $u:[t_0,T]\rightarrow R^m$, $u(t)=(u_1(t), \ldots,u_m(t))$ (13)

$T\in[t_0,T],f :[t_0,T]\times R^N\times R^m\rightarrow R^N$ (50), $f(t,i,u)=(f_1(t,i,u),\ldots,f_N(t,i,u))$ (14)

$Ipsi.:[t_0,T]\rightarrow R^N$ (15) – solution of system (11), U-sub-multitude of space R^m, Ü-multitude of measurable functions $u:[t_0,T]\rightarrow R^m$, $u(t)\in U(t)$-family of the R^m space.

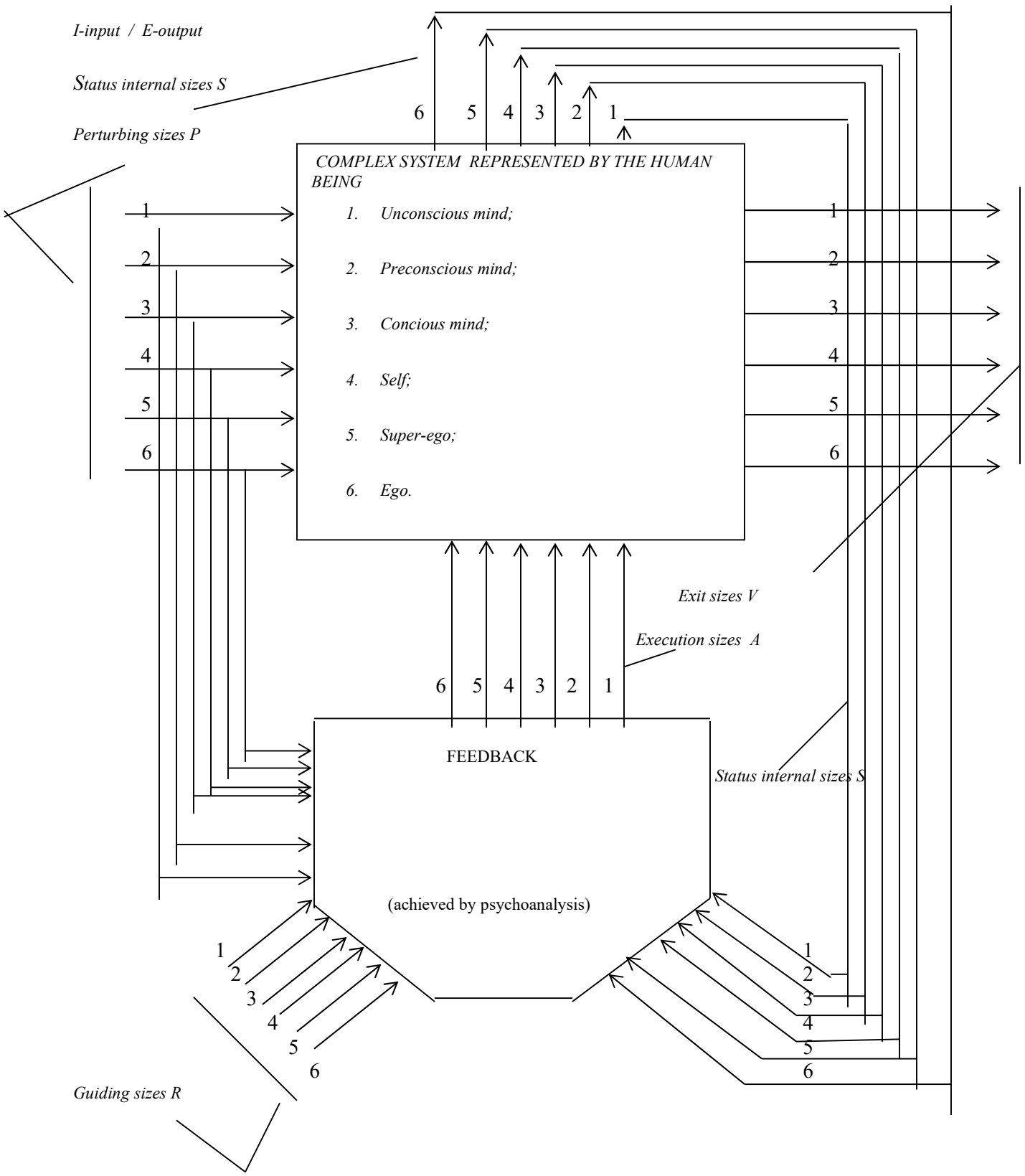
One can determine size E - Onicescu informational energy (connected to the processes of cognition) and size H - informational enthropy (connected to the processes of cognition).

The attached cybernetic diagram is conceived in accordance with the following works:

-Algebraic aspects of the theory of dynamical systems, R.Kalman, Diff.Eq.and Dyn. Systems;

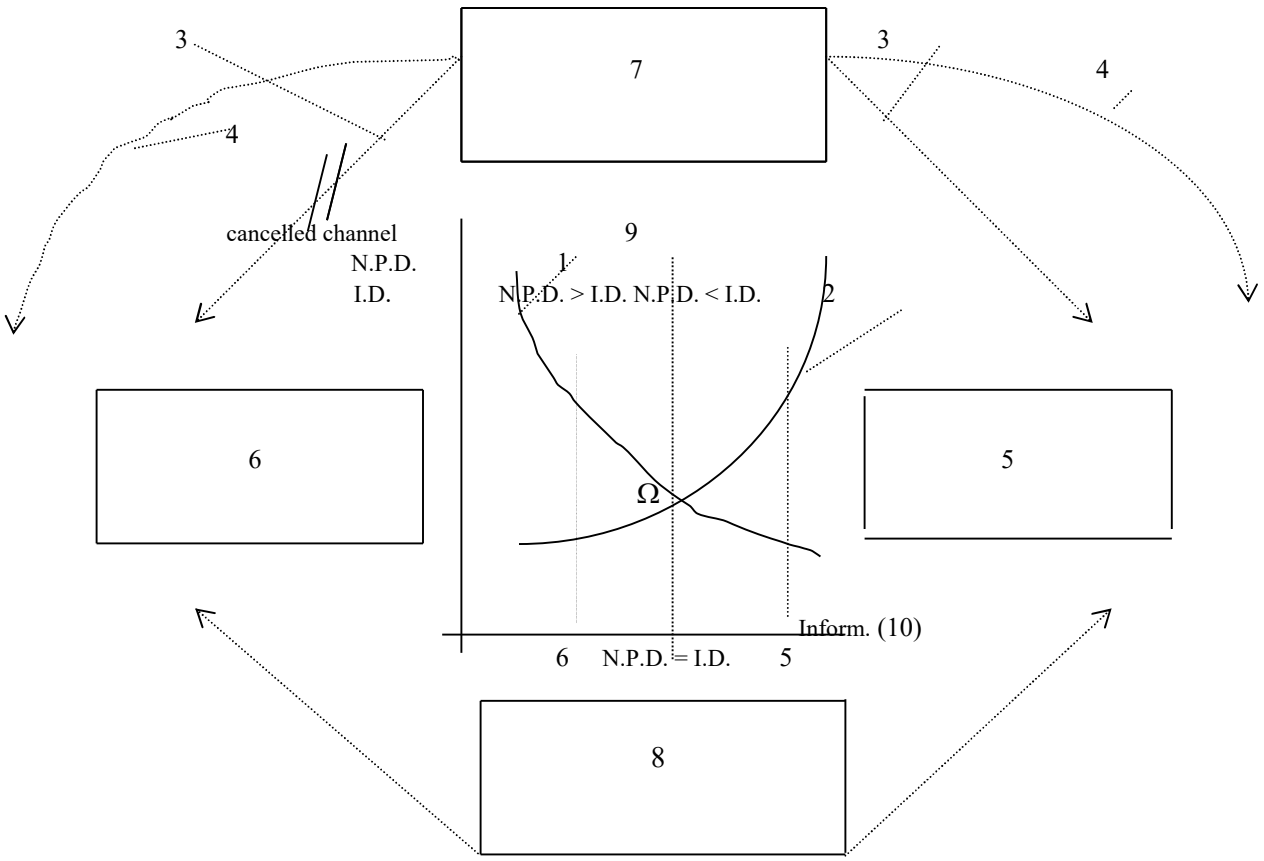
-Lectures on Algebraic Systems Theory, R.E.Kalman, Springer Lecture Notes;

-The Human Use of Human Beings, N. Wiener, Boston, Mass., Houghton, Mifflin.


I-input / E-output
Status internal sizes S
Perturbing sizes P
6 5 4 3 2 1
COMPLEX SYSTEM REPRESENTED BY THE HUMAN BEING
1. Unconscious mind;
2. Preconscious mind;
3. Concious mind;
4. Self;
5. Super-ego;
6. Ego.
1
2
3
4
5
6
Exit sizes V
Execution sizes A
6 5 4 3 2 1
FEEDBACK
Status internal sizes S
(achieved by psychoanalysis)
1
2
3
4
5
6
Guiding sizes R

Annex 2

Apologetical Model:



Legend:

1 N.P.D.- Curve of Non-observance of the Divine Precepts During the Wordly Existence;

2 I.D. – Curve of Divine Love;

3 Communication Channel of Divine Love;

4 Divine Love;

5 Paradise, the "Pure Space" – informational, non-substantial, a-spatial, a-temporal existence;

6 Purgatory – informational, non-substantial, a-spatial, a-temporal existence;

7 Divinity – informational, non-substantial, a-spatial, a-temporal existence;

8 Wordly Existence (substantial);

9 Border existing between (6) and (5);

10 Informational placing.

Remark: In the current paper, the concept of "Purgatory " includes the concept of "Hell", in the sense of Dante Alighieri's work.

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TRANSDISCIPLINARITY (BASARAB NICOLESCU, HEISENBERG, EDGAR MORIN) AND THE ACADEMIC/SCIENTIFIC SUSPICION AGAINST "SUBJECTIVITY" (E. MORIN). A DISCUSSION

HENRIETA ȘERBAN*

Abstract

Basarab Nicolescu proposes a multi-levelled model of Reality

The concept of Reality in Basarab Nicolescu can be understood only in correlation with other concepts, the included middle, the 3-value logic, transdisciplinarity and complexity. Also, in his vision the essence of the Object and the essence of the Subject subsist together. Reality is defined in Basarab Nicolescu as „that which resists our experiences, representations, descriptions, images or mathematical formalizations. Quantum physics caused us to discover that abstraction is not simply an intermediary between us and Nature, a tool for describing reality, but rather, one of the constituent parts of Nature. In quantum physics, mathematical formalization is inseparable from experience. It resists in its own way by its simultaneous concern for internal consistency, and the need to integrate experimental data without destroying that self-consistency." Werner Heisenberg came near the concept of "level of Reality" in his famous Manuscript of the year 1942 (published only in 1984) Heisenberg, who knew Husserl well, introduces the idea of three regions of reality. But Nature participates in the being of the world, hence, there is an ontological dimension to the concept of Reality. As an inexhaustible source of the unknown, nature justifies the very existence of science. Reality is not only a social construction, the consensus of a collectivity, or an intersubjective agreement. It also has a trans-subjective dimension, to the extent that "one simple experimental fact can ruin the most beautiful scientific theory". But Nicolescu, as Edgar Morin, included in his vision subjectivity in interaction in transdisciplinary connection with objectivity...Academia is still very suspicious of "subjectivity," although subjectivity essentially amounts to the everyday experience of life, and particularly of the subjectivity of academics themselves and everything is thought is thought by a subject. Lupasco, Gaigneron, Nicolescu, all affirm that the essential of the Subject as that of the Object must subsist in a synthetic sphere where they are in a relation of conciliation. We consider phenomenological research of lived experience scientific, but feminist scholars of epistemology challenge these limits and stress the importance of fully integrating the knower in all her vulnerabilities. Morin keeps reminding us that life is not confined to one or two disciplines, so the pretense of objectivity unsullied by the contingency of life is met by B. Nicolescu with the conception of vertical complexity and by Morin with a conception of transdisciplinarity that includes personal experience in a "holographic" method, interweaving the planetary and the personal.

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A brief introduction

In Basarab Nicolescu's vision, reality is defined as "what resists our experiences, representations, descriptions, images or mathematical formalizations. Quantum physics has led us to discover that abstraction is not just an intermediary between us and Nature, a tool to describe reality, but one of the constituent parts of Nature. In quantum physics, mathematical formalization is inseparable from experience. It endures in its own way through the simultaneous concern for internal consistency and the need to integrate experimental data without destroying that self-consistency." Werner Heisenberg approached the concept of the "level of reality" in his famous 1942 manuscript (published only in 1984). Heisenberg, who knew Husserl well, introduces the idea of the three regions of reality. The levels of Reality predicated upon in the metaphysics proposed by Basarab Nicolescu are many more and different in kind from those posited by Heisenberg (physical, psychological and artistic, political). For Basarab Nicolescu Nature participates in the being of the world, so there is an ontological dimension to the concept of reality. As an inexhaustible source of the unknown, nature justifies the very existence of science.

Reality is not just a social construction, the consensus of a collectivity or an intersubjective agreement. It also has a trans-subjective dimension, insofar as "a simple experimental fact can destroy the most beautiful scientific theory." Nicolescu, like Edgar Morin, includes in his vision subjectivity in interaction, in transdisciplinary connection with objectivity. The academic world is still very suspicious of "subjectivity," even though it essentially represents the everyday experience of life, especially the subjectivity of scientists themselves, of any agents of knowledge, and every thought is thought by a subject. Lupasco, Gaigneron, and Nicolescu, affirm all in their works that the essence of the Subject, as well as that of the Object, must subsist together, in a common synthetic sphere where they are in a conciliatory relationship.

Phenomenological research on lived experience is considered scientific, and feminist epistemologists challenge the claims associated with objectivity in the pursuit of knowledge and emphasize the importance of the full integration of the knower in all his vulnerabilities. Morin insists on reminding us that life is not limited to one or two disciplines, an idea that is in line with Basarab Nicolescu's conclusion, namely that the claim of objectivity untainted by the contingencies of life is fined by him through his conception of vertical complexity and with a conception of transdisciplinarity that includes personal experience in a "holographic" method, interweaving the planetary with the personal, this aspect of interweaving the personal dimension with the planetary,

he one being also found in E. Morin and Mircea Eliade.

The task of formulating a new concept of reality

The disciplinary access to reality is far too limited. Basarab Nicolescu was not the only scholar to address this matter and impressed with the quantum physics perspective of the world, with Heisenberg's approach to a levelled reality , with Pauli's task of reconceptualizing reality, and especially with Stephan Lupasco's philosophy of the included middle he answers this task with his own *philosophy of the levels of reality and the hidden middle* which led him to a vision of complexity of the world, transdisciplinarity and to a renewed understanding of the relation between Object and Subject. The purpose of transdisciplinarity is the overcoming of disciplinary limitations in knowledge of reality, offering a philosophical access to complexity, to *a more comprehensive understanding of the present world and of the unity of knowledge.*

As we have shown in our previous conferences and works, Basarab Nicolescu mentions in his book *What Is Reality? Reflections Around the Work of Stéphane* Lupasco[8] that he was impressed by the 1948 affirmation of Wolfgang Pauli (Nobel Prize laureate for Physics and a founder of quantic mechanics): "formulating a new idea of reality is the toughest and most important task of our times", so as a consequence, he engages in a lifetime quest that led him to an interesting philosophy of complexity and transdisciplinary integration, in fact, very close to "a theory of everything.[9]

The work of Stéphane Lupasco (Ștefan Lupașcu, in Romanian) was especially inspiring for Basarab Nicolescu who explored and capitalized upon Lupasco's philosophy of the included middle: a new logic with epistemological and ontological interesting consequences leading the path toward a fertile and original concept of reality in Basarab Nicolescu.

The result was Nicolescu's new concept of reality should be understood via a transdisciplinary approach. For Nicolescu, Lupasco is the great reformer of the 21st century thought. "Basarab Nicolescu understands very early that Stéphane Lupasco captures the *geist* of a singular conceptual revolution of modernity through the acknowledgements of quantum physics, a truth understood by many other physicists such as Planck, Einstein, Bohr, Heisenberg, Pauli,

[8] Basarab Nicolescu, *Ce este realitatea? Reflecții în jurul operei lui Stéphane Lupasco* [*What Is Reality? Reflections Around the Work of Stéphane Lupasco*], Translation from French into Romanian language by Simona Modreanu, Iași, Junimea Press, 2009.

[9] See Henrieta Șerban, "On Transdisciplinarity and Complexity in Basarab Nicolescu", *Un-Bordering Disciplinarity. Psychology & Philosophical Studies,* Conference Proceedings, Volume V, "Un-Bordering Disciplinarity. Trans-/Cross-/Postdisciplinary Approaches to Humanities & Social Sciences", Edited by Denisa Elena Drăguşin and Daiana-Georgiana Dumbrăvescu, Rediviva Edizioni, Milano, Italy, 2024, pp. 275-300.

Schrödinger, Fermi, Dirac, Born, de Broglie. At the same time, B. Niculescu was convinced that this conceptual revolution occasioned by quantum physics overpassed the domain of physics and spills over into philosophy."[10]

The scientific revolution induced a fervor, an enthusiasm for science that only grew with all the life and worldview transformative discoveries that gain the trust of people, improving their lives and, even more, science acquired new oversized mythological dimensions for mankind, to the point diffusely portraying science as a competing new form of religion. This status was challenged after WWII and following the horrors of the human disaster of Hiroshima and Nagasaki, humanity started the meditate on ideas such as "science with meaning", "science with conscience", to the point of embracing the idea that "The 21st century is going to be a religious one or it shall not take place at all" (André Malraux). Some considered that the next century is going to be spiritual and the scope taken by the New Age Movement confirmed it to a significant extent and others, such as Ioan P. Culianu[11], Mircea Eliade's assistant and continuator of work, saw science as a humble "apterous fly" perfectly illustrating the challenge posed to the status and legitimacy of science to the advantage of a renewed more prestigious status for philosophy in the 20th century and the beginning of the 21st century (that not many or not all thinkers embraced). Basarab Nicolescu continuing the understanding of the ultimate consequences of quantum physics based on the complex mathematical formalism, found in the works of Stéphane Lupasco emphasized that by the end of the 20th century, three directions were dominant: first, the direction given by Bohr[12] who considered that the principle of complementarity could constitute the starting point of a new epistemology, answering at once to matters of physics, biology, psychology, history, politics or sociology; 2) the non-Aristotelian system of thought of Korzybski[13], with an infinity of values; and 3) the direction open by Lupasco[14] founded on the logic of energetic antagonism.

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[10] *Ibidem*, p. 278.

[11] Ioan P. Culianu [Couliano], *Eros et magie à la Renaissance* [*Eros and Magic During Renaissance*], Paris, Flammarion, 1984.

[12] Niels Bohr, *Essays on Atomic Physics and Human Knowledge*, New Yor, Interscience Publishers, 1963.

[13]Alfred Korzybski, *Science and Sanity*, Lakeville, The International Non-Aristotelian Library Publishing Company, 1958. See also Gaston Bachelard, "La Logique non-aristotélicienne" ["The non -Aristotelian Logic"], in *La Philosophie du non. Essai d'une philosophie du nouvel esprit scientifique*, Paris, PUF, 1940.

[14] Very much like Lupasco, Nicolescu was not exactly well understood and he was not a fashionable thinker, but both were cited by scientists, philosophers, artists and men of culture such as Gaston Bachelard, Benjamin Fondane, Gilbert Durand, Edgar Morin, Henri Michaux, André Breton, Salvador Dali, Georges Mathieu, René Huyghe, Yves Barel, Thierry Magnin or André de Perett. A significant Lupasco Congress was held only as late as March 1988, at Institute of France. In Nicolescu's perspective, the logic of energetic antagonism, especially through the invariance law discovered by Lupasco, represents the most fertile direction of thought by the end of the 20th century. Bohr's principle of complementarity was rather restricted, while Korzybski, despite the contributions to the explanation of the structures of language was vague and less predictive. Lupasco's law of invariance promised the unification of the various fields of knowledge. For the logic of energetic antagonism see Basarab Nicolescu, *Stéphane Lupasco*, Paris, Encyclopaedia Universalis, 1989 and Horia Bădescu and Basarab Nicolescu (eds.), *Stéphane Lupasco - L'Homme et l'oeuvre* [*Stéphane Lupasco – The Man and His Work*], Monaco, Rocher, 1999.

Basarab Nicolescu shows: "By Reality I intend first of all to designate that which *resists* our experiences, representations, descriptions, images or mathematical formalizations. Quantum physics caused us to discover that abstraction is not simply an intermediary between us and Nature, a tool for describing reality, but rather, one of the constituent parts of Nature. In quantum physics, mathematical formalization is inseparable from experience. It resists in its own way by its simultaneous concern for internal consistency, and the need to integrate experimental data without destroying that self-consistency. Elsewhere as well, in so-called 'virtual' reality or in computer generated images, there are mathematical equations which resist: a single mathematical equation gives birth to an infinite series of images. *In potentia*, those images are already present in the equations or in the series of numbers."[15]

Notably, *to comprehend the concept of "reality"* defined as "*resistance* to our formalizations", while *"resistance" is not a philosophical concept* and, from my experience in peer discussions seems to be misleading, we resort to ***an argument for the synonymy between*** **invariance and resistance in Nicolescu's philosophical construction**: science gives specific orientation in knowledge towards reliability, which means invariance and universality; thus, *invariance*, in its strong epistemological version as reliability captures the concept of reliability of knowledge, a concept of the *invariable*, *reliable* knowledge about reality that the human knower can maintain. Nicolescu emphasizes: "The explanation is relatively simple: a kind of statistical belief in what is reality at a given moment is created as an unconscious effect of technoscience. Thus, the dominant concept of reality in the last
century was based on classical science. It reinforces the idea that we live in a rational, deterministic and mechanistic world, destined for unlimited progress."[16]

However, this vision of science is far too simplistic ad it also gave way to contradictions and paradoxes, as well as antagonisms based on the findings of quantum mechanics in contemporary physics; in his terminology, these new findings come from new perspectives and *new explorations, inclusively from an area found between disciplinary formalizations – from the ambiguous, uncertain,mysterious and mostly unacknowledged areas of "non-resistance" of our reality*, around and beyond what we know, which we can situate as B. Nicolescu does, in between disciplines.

[15] Basarab Nicolescu, *Ce este realitatea? Reflecții în jurul operei lui Stéphane Lupasco,* [*What Is reality? Reflections around the work of Stéphane Lupasco]* Translated from French by Simona Modreanu, Iași, Junimea, 2009, p. 4.
[16] *Ibidem*.

To explain the levels of Reality from the perspective of quantum physics and also as a consequence of the *Gödelian incompleteness theorem*, Basarab Nicolescu states that the major cultural and philosophical impact of the quantum physics raised questions challenging the philosophical (and scientific) dogma of the existence of a single level of Reality. Reaffirming his defining view that *reality* represents whatever resists our experiences, representations, descriptions, images or mathematical formalizations Nicolescu adds that Nature participates in the being of the world and we should bridge together the multi-disciplinary, multi-perspectival knowledge achievements associated to Nature, made by science a synonym of Reality in one concept. But this concept cannot be one-levelled anymore for Nature is a surprising and inexhaustible source of the unknown and while it justifies the very existence of science it is also most comprehensively understood in a novel philosophical perspective. The novel perspective proposed by Nicolescu states a plurality of levels of reality, where each level is an „ensemble of systems which are invariant under the action of certain general laws : for example, quantum entities are subordinate to quantum laws, which depart radically from the laws of the macrophysical world. That is to say that two levels of Reality are different if, while passing from one to the other, there is a break in the laws and a break in fundamental concepts (like, for example, causality). No one has succeeded in finding a mathematical formalism which permits the rigorous passage from one world to another. Semantic glosses, tautological definitions or approximations are unable to replace a rigorous mathematical formalism. The recent decoherence models have nothing precise to say on the passage between the quantum level and the macrophysical level: in fact, the main problem is not decoherence but precisely coherence."[17]

He capitalizes as well on the mathematical indications for the impossible continuous passage from the quantum world to the macrophysical world - the *Gödelian incompleteness theorem*. The discontinuity manifest in the quantum world indicates the structure of the levels of Reality, allowing for a unifying concept of Reality and for the co-existence of the two worlds.

Different from the levels of organization of the systemic approaches, the levels of Reality presuppose a break with fundamental concepts that appear plural because they manifest at different levels of Reality. It is relevant that the existence of different levels of Reality has been affirmed by different traditions and civilizations, albeit founded on religious dogma or on the exploration of the interior universe of man or despite that fact that such pioneer thinkers in the exploration of a multi-

[17] Basarab Nicolescu, "Gödelian aspects of nature and knowledge". *Centre International des Recherches et Études Transdisciplinaires* (*C.I.R.E.T.*), vol. 12, 1998. Cf. https://ciret-transdisciplinarity.org/bulletin/b12c3.php.

dimensional and multi-referential reality, have been marginalized by academic philosophers and misunderstood by the majority of physicists (enclosed in their respective specializations). Notably, Edmund Husserl stated the existence of different levels of perception of Reality by the subject-observer. Heisenberg[18], Pauli and Bohr also sustained or suggested ***the multi-levelled Reality, with the subtle ground of an ever closer connectiveness between the Subject and the Object***.[19] The understanding of the notion of levels of Reality leads to an understanding of the Subject-Object connectiveness and of the nature of indeterminacy, like quantum indeterminacy.

The logic of the included middle continued from Lupasco represents an important stage in this process of understanding. The coexistence of the quantum world and the macrophysical world imposes a conceptual overcoming of the vision of a world explained by mutually exclusive contradictories (A or non-A): wave and corpuscle, continuity and discontinuity, separability and nonseparability, local causality and global causality, symmetry and breaking of symmetry, reversibility and irreversibility of time, etc. Classical logic, under the assumption of the existence of a single level of Reality, was founded on three axioms: 1. The axiom of identity; A is A; 2. The axiom of non-contradiction : A is not non-A; 3. The axiom of the excluded middle : There exists no third term T which is at the same time A and non-A.

However, Nicolescu shows, most quantum logics have modified the second axiom of classical logic — the axiom of non-contradiction — by introducing non-contradiction with several truth values in place of the binary pair (A, non-A)., producing a revolution of thought in logic via the multivalent logics. Nicolescu emphasized and fully acknowledged that Stéphane Lupasco has

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[18] Heisenberg knew well Husserl and introduced the idea of three regions of reality: the first region is that of classical physics, the second — of quantum physics, biology and psychic phenomena and the third — that of the religious, philosophical and artistic experiences.

[19] In a fascinating work titled *Poetic Theorems* and published in French, Basarab Nicolescu states at Theorem 15: *L'objectivité dépend du niveau de Réalité.L'objectivité associée au niveaumacrophysique est une pure et arbitrairesubjectivité non-avouée et non-avouable. [Objectivity depends on the level of Reality. Objectivity associated with the macrophysical level is a pure and arbitrary unacknowledged and unavowable subjectivity]. Basarab Nicolescu,* Théorèmes poétiques/ Teoremele poetice, bilingual edition, translation L. M. Arcade, Curtea Veche Publishing, 2013. Also, B. Nicolescu quotes Walter Thirring, who shows in a rationalization of the idea of levels of reality: 1) The laws of any inferior level are not completely determined by the laws of a superior level. Thus, notions well anchored in classical physics, like "fundamental" and "accidental," must be re-examined. That which is considered to be fundamental on one level can appear to be accidental on a superior level and that which is considered to be accidental or incomprehensible on a certain level can appear to be fundamental on a superior level. 2) The laws of an inferior level depend more on the circumstances of their emergence than on the laws of a superior level. The laws of a certain level depend essentially on the local configuration to which these laws refer. There is therefore a kind of local autonomy of respective levels of Reality ; however, certain internal ambiguities concerning laws of an inferior level of Reality are resolved by taking into account the laws of a superior level. It is the internal consistency of laws which reduces the ambiguity of laws. 3) The hierarchy of laws evolves at the same time as the universe itself. In other words, the birth of laws occurs simultaneously with the evolution of the universe. These laws pre-exist at the "beginning" of the universe as potentialities. It is the evolution of the universe which actualizes these laws and their hierarchy. A transdisciplinary model of Nature must integrate all this new knowledge of the emergent characteristics of the physical universe. Walter Thirring, "Do the laws of Nature evolve ?", in *What is life ? - The Next Fifty Years : Speculations on the Future of biology*, edited by Michael P. Murphy and Luke A. O'Neil, Cambridge University Press, 1995.

shown that the logic of the included middle is a true logic, formalizable and formalized, multivalent (with three values : A, non-A, and T) and non-contradictory. He also considered that the absence of the notion of "levels of Reality" in his philosophy obscured its substance and a clear image of the meaning of the included middle was represented by Niculescu via the three terms of the new logic — ***A, non-A, and T*** . The dynamics associated with *A, non-A, and T* by a triangle in which one of the segments (directions in the triangle shape) is situated at one level of Reality and the two other at another level of Reality. At a single level of Reality we have the manifestation of two contradictory elements (example : wave A and corpuscle non-A), but the third dynamic, that of the T-state, is exercised at another level of Reality. Nicolescu explains that it is the projection of T on one and the same level of Reality which produces the appearance of mutually exclusive, antagonistic pairs (A and non-A). The consequence is that a single level of Reality can only create antagonistic oppositions. The T-term accomplishes the reconciliation of the contradictory terms and it is the key in understanding indeterminacy. Also, Nicolescu underlines that the entire difference between a triad of the included middle and an Hegelian triad is clarified by consideration of the role of time (coexistence of the three terms simultaneously in Nicolescu, vs. the termporal succession of terms in the Hegelian triad, and in the latter case we have the impossibility of accomplishing the reconciliation of opposites).

The logic of the included middle only constrains its sphere of validity of the classical logic to one level of Reality.

According to B. Nicolesccu, Gödel has proven in what sense a complete physical theory is illusory: „the search for an axiomatic system leading to a complete theory (without undecidable or contradictory results) marks at once the apex and the starting point of the decline of classical thought. The axiomatic dream is unraveled by the verdict of the holy of holies of classical thought — mathematical rigor."[20]

Understanding complexity starts with transdisciplinarity and a Gödelian approach to the unity of the world. In a vision of the Gödelian unity of the world we need the transdisciplinary approach. By this Nicolescu means that it is necessary to consider a multi-dimensional Reality is thus seen in Gödelian perspective as incompletely described and comprised by one single level of reality. The one-dimensional reality, a new vision of the world, with possible passage from one level of Reality to another, in a (relative) coherence, in a unity made possibe by transdisciplinarity and a modified role of the subject-observer of Reality in the dynamics of the unitary vision of thes levels of Reality; none of the levels privileged.

[20] Basarab Nicolescu, "Gödelian aspects of nature and knowledge". *Centre International des Recherches et Études Transdisciplinaires* (*C.I.R.E.T.*), vol. 12, 1998. Cf. https://ciret-transdisciplinarity.org/bulletin/b12c3.php.

Basarab Nicolescu supposes that this number of levels of Reality is infinite, but we understand that this supposition is not crucial and his metaphysical perspective (model) of Reality can work as well without the presupposition of this infinite number of levels. Each two neighboring levels are united by the logic of the included middle: a T-state of one level is connected a pair of A and non-A elements at the immediately adjacent level. As the T-state is functioning as an operator that unifies A and non-A but this unification at a level different than that of their existence, the axiom of non-contradiction from the classical logic is actually respected. This is what gives the (relative) coherence between different levels of Reality, and, mutatis mutandis, to the natural world. This is the "cosmic bootstrap" governing the evolution of the universe, too. From the infinitely small to the infinitely large, there is this flow of information transmitted via the T-states and the A-non-A pairs via an iterative process continuing indefinitely throughout all the levels of Reality in our physical universe. And this captures the cosmology proposed by Basarab Nicolescu, too.

The limits of complexity are provided to the limits of the occurrence of the A and non-A contradiction. Until an absolute non-contradiction is attained we can speak of an evolution of knowledge and about the openness of knowledge and about the progress of knowledge. Until an absolute non-contradiction is attained we cannot have an unified theory.

Until then, as B. Nicolescu phrases the process of orientation of the levels of Reality by information, "finer matter penetrates coarser matter, just as quantum matter penetrates macrophysical matter, but the reverse is not true". We have "degrees of materiality" along an "orienting arrow" regulating the "transmission of information from one level to the other", within an ever more comprehensive Reality governed by ever more general, unifying, and encompassing laws. ". But Nicolescu, as Edgar Morin, included in his vision subjectivity in interaction in transdisciplinary connection with objectivity...Academia is still very suspicious of "subjectivity," although subjectivity essentially amounts to the everyday experience of life, and particularly of the subjectivity of academics themselves and everything is thought is thought by a subject. Lupasco, Gaigneron, Nicolescu, all affirm that the essential of the Subject as that of the Object must subsist in a synthetic sphere where they are in a relation of conciliation.

We consider phenomenological research of lived experience scientific, but feminist scholars of epistemology challenge these limits and stress the importance of fully integrating the knower in all her vulnerabilities. Morin insists on reminding us that life is not confined to one or two disciplines, so the pretense of objectivity unsullied by the contingency of life is met by B. Nicolescu with the conception of vertical complexity and by Morin with a conception of transdisciplinarity that includes personal experience in a "holographic" method, interweaving the planetary and the personal.

As a consequence, Nicolescu can postulate informational coherence restricted to the levels of Reality, limited at the "highest" level and at the "lowest" level. Then to continue the idea of *open-unity*, the thinker has to imagine and accept that the unity of levels of Reality "is extended by a zone of non-resistance to our experiences, representations, descriptions, images and mathematical formalizations (…) 'veil' which Bernard d'Espagnat referred to as 'the veil of the real'".[21] And then Basarab Nicolescu explicitly states that this zone of absolute transparence is due to the "limitations of our bodies and of our sense organs", "regardless of the instruments of measure used to extend these sense organs", ***"corresponds to the sacred, that is to say to that which does not submit to any rationalization"*** [our emphasis].[22]

In his model the correspondent of the coherence of the levels of Reality is the coherence of levels of perception (a zone of non-resistance to perception) constituting *the transdisciplinary Subject*, just as the coherence of the levels of Reality was posit to constitute *the transdisciplinary Object*, which are the more closer together as their zones of non-resistance (of laws) are similar and they coincide when the zones of non-resistance are identical.

We have to observe that Basarab Nicolescu's metaphysics is a *metaphysics* only until the evolution of knowledge comes to that point of exhausting contradictions assessing the levels of Reality and all their Laws. At the same time his metaphysics has strong epistemological and phenomenological dimension. The latter is captured by the idea that the levels of perception are oriented by a flow of human consciousness, namely of the awareness of the distance-nearing relative appropriation of Reality via perception. The flow of consciousness is hopefully becoming to coincide with the flow of information, when the two flows are isomorphism due to scientific inquiry (our models, formalizations, scientific laws that "resist" change and function scientifically) and also due to the "zone of non-resistance", due to the sacred, too. This is the reason why "the study of the universe and the study of the human being sustain one another", because the common zone of non-resistance, the zone of the sacred, the veil, "permits the unification of the transdisciplinary Subject and the transdisciplinary Object" while preserving their difference.

All the dualities are transgressed in transdisciplinarity (subject/object, subjectivity/objectivity, matter/consciousness, nature/divine, simplicity/complexity, reductionism/holism, diversity/unity). The human beings have their chance at open knowledge via this transdisciplinary *open unity* "which encompasses both the universe and the human being", encompassing both "simplexity" and "complexity" in this transdisciplinary approach where *everything is linked together*. We can evoke the idea of Edgar Morin who actually defines complexity as "what is woven together". He shows

[21] *Ibidem*.
[22] *Ibidem.*

that the multidimensional approach to human nature—and to inquiry in general—could not submit to the man/nature divide. In the social sciences there was either the quantitative approach found in sociology (what Pitirim Sorokin called "quantophrenia"), generally anemic attempts to copy the method of physics, or the more philosophically inclined tendency to reject anything associated with the natural sciences as reductive, as "science" or "biology". In natural science, the almost complete absence of reflection on the role of the researcher created blind spots that science itself could not address in its most rigid configuration.

Edgar Morin's book *Le Paradigme Perdu* was written before the emergence of sociobiology and evolutionary psychology, but this is not the greatest merit, the anticipation of some conceptualizations in sociobiology, but the fact that Morin outlined an agenda of problems, still extremely fertile. Among these issues to be discussed, the man-nature division is particularly important, in correlation with the nature-culture division, with the scientific culture-humanistic culture split. Morin does not stop at highlighting some problems, but proposes to approach them with a different way of thinking, which we may call comprehensive perspectivism", a complex, conjunctive-comprehensive "and-and" thinking, not "disjunctive ("neither-nor" /"or-or"), in which he has as interlocutors Basarab Nicolescu and his conception of multi-level reality, the conception of Ilya Prigogine, Francisco Varela, Brian Goodwin, Stuart Kauffman, the mathematician Réné Thom and the philosopher Michel Serres[23]. We can understand seen things in the wider perspective opened by Basarab Nicolescu's vision that the suspicion of academia against subjectivity is a mere limitation of the vision of one-level Reality.

Complexity is not an accident but a datum. In Basarab Nicolescu, science is functional because is conceptually integrated as a functioning whole, as an open system and Nature is a living whole as life is present in all its degrees demanding the integration of lived experience in any knowledge of Nature. Thus the dialogue among all disciplines is necessary and their integrative approach is necessary, while the concepts of science with meaning and science with consciousness are paramount.

[23] Michel Serres (1930-2019) is a remarkable philosopher of temporality, fluidity, porous boundaries and the play of connections with the whole.

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NONE OF THE CATS OF POETS OR PHILOSOPHERS SPEAK

SOME NOTES ON POSTANTHROPOCENTRISM*

VIORELLA MANOLACHE*

Abstract

The present text proposes *some notes* on post-anthropocentrism, an approach that will highlight the perspective of Rosi Braidotti, and thereby of Michel Foucault, the last one included in the personal debate that Rosi Braidotti initiates and which targets the posthuman. The reading of post-anthropocentrism, confirms that becomings are not only metaphors, and that – *here* – the extrapolation of the singular to two –Braidotti & Foucault – (co)implies the multiplication of meanings.

Keywords: *Postantropocentric approaches; Rosi Braidotti; Michel Foucault; Cats; Insanity*

"Animal studies are similar (...) to driving of a flock of cats"[24]

The statement placed as an introductory framework of this article resorts to the analogy/comparison used by Cary Wolfe with the explicit purpose of giving added meaning to a perspective meant to capitalize, on the one hand, on an entire historical arsenal composed of an accumulation of ideas and attitudinal reactions of the human towards animals, by showing the way in which the human has built and has been built by and in relation to them. On the other hand, it insists on the novelty of historical disciplinarity and cultural studies which, in combination, launch and sustain the perspective according to which the animal no longer represents only a subject/object, but a complex structure with its own particular requirements. The path traced here is an open one – from discourses and conceptual matrices, to the relaxation of critical positioning and to the way in which the animal becomes interconnected or oppressed by referencing/being referred the extended set of forms of identity and discourses specifying the issues of race, gender, class or sexual difference.

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[24] Cary Wolfe, "Human, too human. Studies on animals and humanities", in *Post/h/um. Jurnal de studii (post)umaniste, 5.2. Animale* [*Journal of (Post)Humanist Studies, 5.2. Animals]*, https://posthum.ro/5-2-animale/cary-wolfe-omenesc-prea-omenesc-studiile-despre-animale-si-umanioarele, accessed on 1 July 2024.

In the individual(ising) sense proposed by Cary Wolfe, the mentioned approach targets two intersecting levels: the first considers the valorisation of animals as material (non-human) entities through a discourse of species difference; the second firmly establishes that the field of animal studies is concerned with clarifying a guiding imperative – *to like or dislike animals* – by emphasizing the shift felt "in the ethics of reading and interpretation that accompanied the consideration of sexual difference, in the 1990s (in the form of queer theory), or of race and gender, in the 1970s and 1980s"[25].

In the reading/interpretation (re)launched by Cary Wolfe, the categorial structures aimed at *animal studies* and *human-animal studies* remain, to the same extent, problematic, demanding the extrapolation of the theme and the object of knowledge towards a theoretical-methodological approach trying to reach the location of a point/node of intersection with posthumanism. *Détente* requires itself to be balanced – "not in the sense of a fantasy of transcending human embodiment (...), but, rather, in the sense of a return to the density and finitude of human embodiment and to human evolution as a specific form of animality, unique and different from other forms, but no more different, perhaps, than an orangutan is different from a starfish"[26]. According to Cary Wolfe, *animal studies* must be placed both in the *corpus* of a humanistic discipline and *practice* (as an internal practice) *and* inside a posthumanist discipline (as an external/external disciplinarity).

Any agreed formula meant to think about non-human entities within the posthuman theory resorts in itself to valuing the premises of an ethics involved in establishing the place and role of the human in relation to a set of decentralized and delineated self-projections. Patricia MacCormack[27] resorts, in this sense, to posthumanist-poststructuralist meanings that deliver alternatives based on representations of the altered territories of an experience of species by reviewing a relationship and a relevant rapport, that between *who* and *what*: "theorists concerned with the abolition of the human - animal distinction and with the question of identity as *ego* (...) consider the liberation of the problematic concept – non-concept of *animal* (...). The first to criticize man's status as *someone* is the question of *who*. For Derrida, the question *Who am I?* persists, even on the verge of being impossible to answer. The second is the interrogation of the human-animal division at the level of

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[25] *Ibidem*.
[26] *Ibidem*.
[27] ***Patricia MacCormack, "Animalitate. Etică și abolire absolute" ["Animality. Ethics and absolute abolition"], in* Post/h/um. Jurnal de studii (post)umaniste, 5.2. Animale [Journal of (Post)Humanist Studies, 5.2. Animals], *https://posthum.ro/patricia-maccormack-animalitate-etica-si-abolire-absoluta/, accessed at 14 August 2024.***

species, showing that it is vague, imaginary and deeply redundant, arising from man's compulsive need to dissociate nature from culture"[28].

Rosi Braidotti and/about the perspective of post-anthropocentrism

By placing the posthuman in the corpus of a syntagm with comparative value, Rosi Braidotti[29] potentiates the *posthuman as an animal-becoming* with a set of modalities through which postanthropocentrism becomes marked by the functional existence of some pivots/mechanisms of hierarchical dislocation operable inside/between animal species and Man, creating the fault line of an ontological vacuum subsequently populated – non-selectively – by what generically *becomes* included in the category of *other species*. What Rosi Braidotti questions – as the launching point of a (re)visited theoretical construction – is the subject of humanism itself, received both as abstract universe and as *Anthropos*, a title considered illogical, in the sense that it is based on the very reasoning of political autonomy, that of Man as a rational animal.

If – projectively – any emitted expectations are directed towards an ideal-functional corporeality, with grids marked by the persistence of schematized landmarks recognized in/through "white masculinity, normality, youth and wealth", the dialectic of alterity imprints with dynamic meaning a rhythm with valences for distributing hierarchical differences in relation to the instruments of government, excluding the others and deepening an accumulation of categorical-ontological divisions inside/between Man and zoo-morphic alterities[30].

The perspectives put forward by Rosi Braidotti converge towards establishing a set of (i)mediated evidence of the fact that post-anthropocentrism displays the way in which "animals are equally introduced into a global market economy that transforms them into commodities at a comparable level and thus makes them equally dispensable"[31]; and that, based on a *zoe-egalitarian* turn, "contemporary post-anthropocentric thought produces an anti-Oedipal animality inside a changing techno-culture"[32].

The quality which individualizes the interpretative grid operated by Rosi Braidotti is aimed at justifying the premise according to which the posthuman allows for a distinctly filtered angle in relation to postanthropocentrism, in the sense that postanthropocentrism (co)involves the open-extended meanings of transdisciplinarity, in order to give substance to a research question that is

[28] *Ibidem*.
[29] Rosi Braidotti, *Postumanul [The posthuman],* Hecate Publishing House, Bucharest, 2016.
[30] *Ibidem,* p. 93.
[31] *Ibidem*.
[32] *Ibidem,* p. 97.

dually branched – "what meanings of contemporary subjectivity and subjective formation are facilitated by a post-anthropocentric approach?" and "what comes after the anthropocentric subject?"[33].

The guiding arguments, here imbued with response value, consider a set of landmarks recognized in/through: the multiplication of deterritorialized differences; the reception of subjectivity in the hypostasis of an extended relational self, a relational aptitude that targets the accumulation of non-anthropomorphic elements; postanthropocentrism is equated to the dynamic politics of *zoe*, as a dynamic element of vitality, a generator of life itself. Hence, the innovative relaxation of perspective, of punctuation and individualization of the considered coordinates: "(...) The political economy of biogenetic capitalism is post-anthropocentric in its very structure, but not necessarily or automatically posthumanist (...). The posthumous dimension of postanthropocentrism deconstructs the supremacy of species (...) Animals, insects, plants and the environment, in fact, the planet and the cosmos as a whole are called into play"[34].

Braidotti & Foucault

If we were to place Rosi Braidotti anywhere in the open equation of postanthropocentrism, she needs to be situated in interdependence with the theories of Donna Haraway[35] or, as she explicitly acknowledges, as an independent in relation to Deleuze and Guattari[36]; and (especially in the work *The Posthuman*) tangentially/by ricochet interested in drawing Michel Foucault into a debate that she initiates and which targets the posthuman. It is precisely the latter that becomes here – in the corpus of the present text – an articulating node for a reading-reference, able to consider [Foucault] as being inserted into any debates on the posthuman. But, more than that, Foucault becomes part of that gallery of French thinkers whose relationship with the otherness of animals creates an appearance – not contextualiz(ingly) deepened – according to which Foucault had a black cat, Insanity.

[33] *Ibidem,* pp. 80-81.
[34] *Ibidem,* pp. 90-91.
[35] Donna Haraway, *The Companion Species Manifesto. Dogs, People and Significant Otherness,* Prickly Paradigm Press, Chicago, Illinois, 2003.
[36] G. Deleuze and F. Guattari, *Anti-Oedip. Capitalism și schizofrenie [Anti-Oedipus. Capitalism and schizophrenia],* Paralela 45 Publishing House, Pitești, 2008; or *Mii de platouri. Capitalism și schizofrenie [Thousands of plates. Capitalism and schizophrenia],* Art Publishing House, Bucharest, 2013.

In quantifying a set of memories with significance for the problem of the posthuman[37], Rosi Braidotti (re)fixes some landmarks relevant to the point of intersection with Foucault, validating the announced relationship – *Braidotti & Foucault* – in a/through a biography made more relevant through Braidotti's confession that she studied with Foucault, Irigaray and Deleuze in Paris in the 1980s; an encounter to which she attributes a major place and role in defining subsequent approaches that she will later develop. The aforementioned plethora is considered by Rosi Braidotti to be the benchmark of "innovative thinkers", becoming models through the respect they induced for "the complexity of language as a material and semiotic structure", for the articulation of a habitable, but uncontrollable space of thought, deepening "the critique of unitary identities and hegemonic power formations based on this understanding"[38]: "I feel deep and lasting respect and loyalty for my teachers, who belong to the tradition of French neomaterialism and continental naturalism. This tradition avoids an exclusive emphasis on social constructivism, on the one hand, but also on reductive essentialism, on the other (...) Knowing, however, that the French theory is a particularly American invention and that Yale played a central role in it, I want to review it through a different spectrum: embodied and impersonated vital materialism, which will also influence the contemporary recomposition of posthuman knowledge"[39].

The cognitive-ethical perspective developed by Rosi Braidotti and applied to the posthuman condition capitalizes on the neomaterialist-relational vision of subjectivity, to which she adds a feminist theory, relocating [the theory] on an idealistically-open route, but with two *caputs*: from the rejection of dualism, to the questioning of any claims of transcendental universalism - and up to the way in which French philosophy puts it back into circulation; on the one hand, through Kant, Levinas and Derrida; and on the other, from Spinoza and Nietzsche to Foucault and Deleuze[40].

In/through the aforementioned course, Rosi Braidotti invites us to the arrested projection/thought, to "the classic posthumanist example of Michel Foucault's image (1970) of the face of 'Man', drawn on the sand of the seashore, which is gradually erased by the waves of history"[41], pondering whether the all-encompassing meaning is that of extinction or renewal. What matters is "the way in which Foucault's genealogical method struggles with this conceptual paradox: at the moment of his dissolution, Man becomes thinkable as such and appears as a present

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[37] Rosi Braidotti, *Posthuman, All Too Human: The Memoirs and Aspirations of a Posthumanist,* The Tanner Lectures on Human Values, Yale University, March 1–2, 2017.
[38] *Ibidem,* p. 7.
[39] *Ibidem*.
[40] *Ibidem,* pp. 7-8.
[41] *Ibidem,* p. 14.

concern. Until that moment it had not come to the surface of the critical eye, because it functioned as an implicit notion"[42].

Along the lines of Foucault's critique of the humanist ideal, with a referential boundary found in the sovereign notion of reason, Rosi Braidotti preserves the Foucaultian inflections which she develops from the angle of posthumanism and in the direction of the posthuman turn as a materialistic and neo-foundationalist approach, highlighting a non-unique meaning and non-identical route, distinguished by the existing divisions of power[43].

In this context, Foucault's (warning) placement in the category of philosophers with *first-generation studies* (in a radical-interdisciplinary sense) remains relevant, with reference to gender, feminist, queer, postcolonial, cultural and film or media *studies*, received as prototypes of radical epistemologies, institutionally underfunded but capable of conceptual and methodological changes, offering alternatives and sources of inspiration for the *posthuman moment*. However, Rosi Braidotti insists, "my beloved teachers (...) Foucault as much as Deleuze and Irigaray – they were, to a large extent, philosophers. As such, they were not particularly interested in or supportive of the new interdisciplinary studies that were emerging"[44].

"Can the cat be the measure of at least some things, if not all of them?"[45]

The challenge to which Rosi Braidotti responds is the tendency to deterritorialize/nomadize the human-animal interaction, precisely in order to transcend the dialectic of alterity, including a *detente* of the secularization of human nature and life. Following in the footsteps of Donna Haraway, Rosi Braidotti launches a double question – "can a cat or a dog be the measure of at least some things, if not all of them?"[46] and "can this disrupt the genomic hierarchy that has tacitly supported the self-representation of humanists"![47] – resorting to the ironic meaning of the images of S. Harris ("Leonardo Da Vinci's Dog") and Maggie Stiefvater ("The Vitruvian Cat").

A possible answer articulated by Rosi Braidotti would insist on the evidence that postanthropocentrism relaunches a politically affirmative project of changing the operable relation(ing) inside/between speciesisms in favour of an ethical approach to *what bodies can do,* in

[42] *Ibidem*.
[43] *Ibidem,* pp. 17-18.
[44] *Ibidem,* pp. 33-34.
[45] Rosi Braidotti, *Postumanul [The Posthuman], quoted work*, p. 99.
[46] *Ibidem*.
[47] *Ibidem,* pp. 99-100.

order to "think of dogs, cats and other couch companions as crossing species distinctions not only affectively, but also organically"[48].

Derrida's approach in "And Say the Animal Responded?"[49] becomes – here – decisive, although Rosi Braidotti does not explicitly draw him into the discussion, the text being however one of primacy for Donna Haraway[50] (in the already announced Braidotti - Haraway interdependence, functional in this context as well), by (re)locating the problem within the limits of an old philosophical scandal, that of judging the "animal" as being capable only of a reaction tributary to the animal-machine reflex. The fragment that Donna Haraway considers fundamental in the Derridean text is that about *real* animals looking back at *real* human beings.

Starting from the statement – "The cat I am talking about is a real cat (...) It is not the figure of a cat. It doesn't silently enter the room as an allegory for all the cats on Earth, the felines that permeate myths and religions, literature and fables"[51] – Donna Haraway points out that Derrida knew he was in the presence of a being, not a reacting machine[52]; more than that, the crucially important fact was not the act of "giving the word back" to animals, but to access a different way of thinking – cats look back *scientifically, biologically, philosophically* and *intimately.* But, as Donna Haraway considers; "through his cat, Derrida failed in regard to a simple obligation of any companion species; he did not become curious about what the cat could in fact do, feel, think, or offer him when it looked back (...) Without being curious, he missed a possible invitation, a possible introduction into the world of a different nature (...) Therefore, as a philosopher he knew nothing more about, from, and with the cat at the end of the morning than he did at the beginning. (...) In order to respond to the cat's attitude towards his presence, it would have been necessary to add that flawed but rich philosophical canon to the risky project of asking oneself (....) what do cats have to say and to deepen (...) the cat-cat and cat-man behavioural semiotics whenever the species meet"[53].

Conclusively, whatever Donna Haraway considers about Derrida's cat – "that consciously-embodied encounter did not motivate his philosophy in public. What a pity"[54] – can be applied, up to a specific point, to the Foucault - Insanity relationship, a relationship easily overlooked and preserved only in a photographic mention. Insanity becomes – here – a Derridean *animot*, in the

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[48] *Ibidem,* p. 100.
[49] J. Derrida, "And Say the Animal Responded?", in J. Derrida. *The Animal That Therefore I Am,* Fordham University Press, 3rd Edition, New York, 2008,119-141.
[50]Donna Haraway, *When Species Meet*: University of Minnesota Press, Minneapolis London. 2008.
[51] *Ibidem,* p. 19.
[52] *Ibidem*.
[53] *Ibidem,* p. 22.
[54] *Ibidem,* p. 23.

sense that the presence of the black cat in/from Foucault's arms can be equated with a motivation-exposure of a type of manifest power. Insanity, surpassing its status as a named animal, is no longer the figure of a cat (*this is not a pipe*/*a cat*)! It is neither an allegorical sign, nor a zoopoetic projection. *None of the cats of poets or philosophers speak*, Derrida reminds us, reconfirming the evidence integrated into a single sentence in/from *Alice in Wonderland*: "it was, after all, really a cat" or, in the French alternative – "when all is said and done, it truly was a black cat"[55].

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[55] J. Derrida, *quoted work*, p. 7.

` A PEDAGOGY OF APPLIED LANGUAGE: FROM *CROSS* TO *TRANS* DISCIPLINARY APPROACH

Prof. PhD. Violeta NEGREA[56]

MOTTO

The mystery of the Universe is its comprehensibility.

Albert Einstein

ABSTRACT

Our commitment to *trans*-disciplinary approach for the applied language pedagogy derives from the need to a further comprehension of the professional, social and individual realities.

The never-ending challenge of knowledge building develops fresh insights of the relationship between real-life concerns and new-born research approaches and their application. The XXI-st century *trans* disciplinary innovative research approaches linguistic studies to find self-corrective capacities able to produce relevant and strategic pedagogy of applied language learning, knowledge building and application for sustainable professional and social development. Language capacity to develop individual idiosyncrasies producing sensible knowledge and understanding shows maturity and freedom of consciousness in terms of professional and cultural identity, but it can also develop social and cultural discrimination and inequity.

Our article is dedicated to the development of a beneficial and effective applied language teaching philosophy with desirable outcomes aiming to pass from the *cross* to the *trans* disciplinarity approach which seems to minimize and invalidate individual perception of knowledge, but to make it open, wholesome and complex and produce not only specific, but general and transversal competences. The article aims to develop theoretical and practical *trans*-disciplinary language pedagogy based on a triadic perspective on semiotics and comprehension practices.

KEY WORDS: *language pedagogy, trans-disciplinary approach; theoretical advancements; sustainable professional and social transformation*

1. Theoretical framework

Education is the most comprehensive and dynamic part of the continuous process of individual and social evolution since the very dawn of civilization. A historical approach to formal education phenomenon makes possible a thorough comprehension of its contribution to human and social radical changes along the ages. The diversity of formal education approaches points out the steps that humanity took as a result of its own education progression. Our limited historical account aims at grasping the onward orientation of formal instruction to match the individual and social needs to consequently introduce the *cross* and followed by *trans* disciplinary approach that call for language

corrective capacities.

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The development of conventional instruction in ancient Egypt and Mesopotamia turned into a systematic knowledge transmitter and builder in terms of cultural traditions, moral values and practical skills which made possible the individual distincteveness of social groups and later national identity.

A liberal and broad-based curriculum was developed by the ancient Greeks and later Roman formal education system. In the Middle Ages the church turmed into the dynamic protector and supporter of education with monasteries and cathedral schools which further founded the first universities in Europe which contributed vigorously to the civilization process of the continent. Intensive and progressive research was carried out that made subjects independent, like philosophy, botanics, chemistry, mathematics, accounting, technology, music, arts, etc. Numerous monastery museums left in Europe stand proof to the monumental contribution added to education by church in Europe: the Abbey de Cluny, la Grand Chartreuse, Liege, Anderlect, Bruges, Aachen, Regensburg, Berlin, San Marco, Certosa de Pavia, Ravena, Florence Duomo, Stein am Rhein and many, many others…

Renaissance witnessed a different approach to formal instruction in Europe which focused on humanism that switched value to human capacity and its subsequent potential achievements. As a result, the Industrial revolutions brought about consistent economic, social changes that determined additional education feedback as literate and educated workforce was needed more and more. As a growing result, educational system underwent massive transformation worldwide to meet new social and economic demands.

2. Transdisciplinarity as a knowledge integration approach

Opinions on the chaos of disciplines in the 20th century (Abbot, 2001) cannot minimize the contribution of the research theories, approaches, methods and instruments. Nevertheless, it is expected that an integration of language study, knowledge and its pedagogy.

Experimental learning, critical thinking, democratic values comprehension and practice have been increasingly approached in terms of *cross* disciplinarity which has advanced into *trans* disciplinarity as an ableness to build a direct and stable relationship between science and awareness, spirituality and coherence, sense and sensibility. (Bețivu, 2020)The reality comprehension consists of the actual life experience which integrates knowledge based on speculative and practical background leading to a new level of perception. Education based on the relationship between perception and reality is essential for an appropriate daily behavior as it makes human think before, not after, and prepare him to preview and act. Reality, as a pocket of several

levels of comprehension, makes comprehension a pocket of several realities. The various comprehension levels come out from a balanced knowledge of plentiful perception levels which reveal the open complexity of Reality added to the open complexity of Perception. (Nicolescu, 2007 Reality is made of *subject, object* and *spirit* which are its very intrinsic sides.

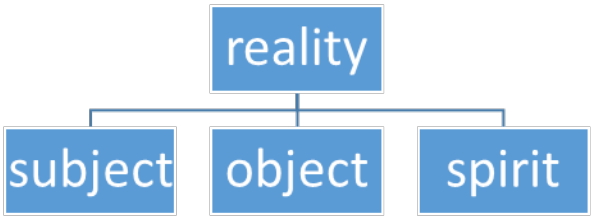

Figure 1 Reality, as a pocket of comprehension and knowledge

If only one of them is missing, then Reality is not real any more. A Reality leveled down to the *subject* made traditional society be annihilated by modernity, while a Reality leveled down to the *object* leads to totalitarian social expression. Reality limited to *spirit* leads to fanatic and integrated religious expression and behavior. The *trans*-disciplinary instruction approach is then, a new stage of the social human being evolution in terms of external knowledge together with objective self perception. A new type of human evolution comes out from culture, science, awareness and relationship which is conditional to human biology. Both awareness detached from knowledge and knowledge detached from awareness lead to human annihilation, but responsibility turns knowledge into awareness. (ibidem)

3. The *cross* and *transdisciplinary* approach to applied language pedagogy

The shift from *cross* to *trans disciplinary* background to language pedagogy drives knowledge and practice building to the reconstruction of ideologies, beliefs, habits, traditions specific to the culture of social communities made by language development. The research opportunities opened by the *cross* to *trans* disciplinary approach are supported by communication functionality and non-neutral relationship between linguistic sign representing the world, the world itself and references.

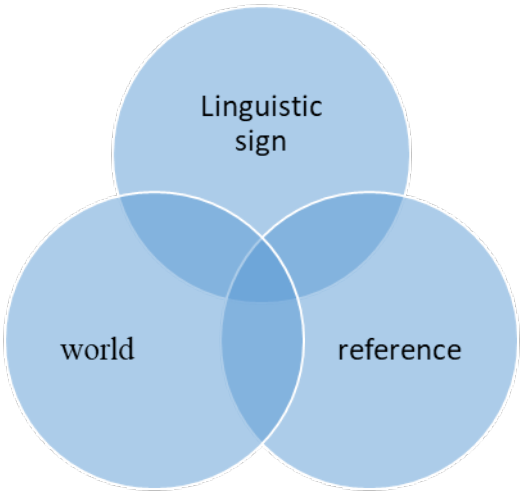

Figure 2 Communication functionality and non-neutral relationship between linguistic sign, world and references

We focus on language samples analysis based on *cross* to *trans* disciplinanary approach bringing forword the social and cultural nature of the linguistic information. The understanding and acknowledgement of the language accumulation of cultural values target the improvement and responsibility of the social behaviour (Hudson, 1996) expressed in the material nature of word. (Vâlcu, 2013) which is transferred through language education.

Humankind experiences extra-plannet travel and the microcosmos of the human body as the new technologies of artificial intelligence have overcome imagination and expectations. They are motivated by the principles and rules governing life itself which have been developed into language forms. Language study from *cross* and *trans* perspective unlock language full potential to make use of its culture of origin panorama and knowledge development through meaning transfer, but also by the continuation of semantic values accumulation. The following diagram illustrates the complementarity of the two complex processes produced by word.

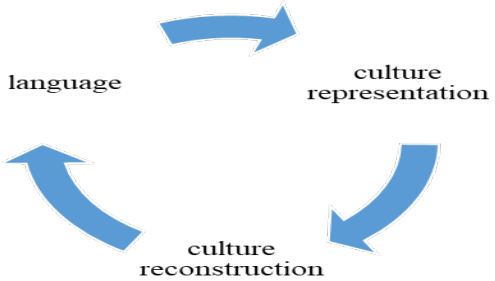

Figure 3 The relationship of language with culture reconstruction

The concern for the development of *cross* and *trans* disciplinarity approach to language investigation is enacted by the specificity of information in terms of linguistic practices for mediation of ideas and materiality of human life. Historical, social and cultural contextualization of language aims at expectations, purposes, beliefs, individual and social moral values. (Hudson, 1996) These aims have opened opportunities to study human behavior, representation policies, power legitimacy, cultural basis to political doctrines, political conflicts, socialization process, individual and social composition, sesitiveness structure, ritual and social control, knowledge and cognition, artistic performance and its perception, etc, are directions to *cross* and *trans* disciplinary approaches to language study.

4. Approaches and Views

The *cross* and *trans* disciplinary approaches are backed by language communication functionalism which makes it able to distinguish individual and social reasoning in terms of linguistic representation. Language study is based on non-neutrality of language *sign*, as a representation of human world and language *significance* which defines the real world items (Vâlcu, 2013) aiming at the semantics which reveals communication intentionality. The analyses of current language practices provide information about language accumulation along its historical development. Boas[57] (1982); Malinowski (1923); (Inglehart, 1977)

Reasoning movements have developed and integrated language functionality into consistent theoretical approaches, such as Structuralism which places cultural capacities into a large systemic context making language its sub-structure[58], having the capacity to constantly improve and inhance it. Structuralist approach[59] makes possible the *trans* disciplinarity approach to language study which is not just a communication instrument, but a comprehensible medium of exchange between past, present and future. (Duranti, 1997) The *cross* and *trans* disciplinary approach makes cultural symbols provide information from expressive silence or hidden interpretations of speaking (Bauman; Briggs 1990) which are able to show specific socio-cultural values. Generic oral greetings, for example, stating the social and inter-generation relationship, can take the form of a question (*How are you?*), the expression of a deep consideration, such as the Romanian *Sărut*

[57] Franz Boas (1858 – 1942) A German origin American anthropologist.
[58] Blackburn considers that humanity is not to be understood but contextualized by human relationship which is behind the abstract culture rules (Blackburn, 1995).
[59] Theoretical paradigm which focuses on culture as a generic structure to underline basic human aspects: *reasoning, perception, feeling*. Structuralism makes observation possible due to its considering culture an abstract life framework, beyond its local variables. (1996) *Oxford Dictionary of Philosophy.*

mâna![60] or a wish addressed to the conversation participant: *Bonne journée*[61]. It is the same approach which suggests individual and social greeting exchange which seeks the answers to cultural differences based on gender, age, social or professional status, cultural context, situation and representation.

But why do people greet each other? How did it happen that communities built up their specific social and cultural relation rules that people feel like learning and practicing them? How do they know when to greet, and how to greet? The *cross* sociological investigation contributes to the passage from *cross* to *trans* disciplinary language research in terms of the comprehension appropriateness and its further application and changes which facilitates integrated cognition capacity.The *phenomenological*[62] view on culture provides some specific variables to be taken into account by the *transdisciplinary* language study (Cicourel, 1973).

The linguistic philosophy developed by Bourdieu advocates language as an outcome of social priciples and rules but also as a result of education and formal instruction. His theories are based on culture criticism as a rational system built up on faith, individual and social experience.This overview aiming at further integration of Heidegger"s perception of instinctual model and rational knowledge and cognition capacity enrich the language *trans* disciplinary research targetting effectiveness of its pedagogy. (Bourdieu, 1989)

The evolution of language content is also subject to research in terms of *cross* disciplinarity based on social communities and instruction contribution aiming at integrating *trans* disciplinarity, making human dialogue defined by community relationship based on gender, social classes, religious status, etc. The concept of *power*, as the object of a *trans* disciplinary language research is expressed through language practice of dialogue, which is considered as an intersection between human and social forces. The speaker attitude, and behaviour are becoming obvious from the language and non language signs, like certain conceptual association, unvoiced vocabulary, body language, etc,and many other means of expression which make language turn into a social act. (*ibidem*)

Contributions of Max Weber[63] in 2011 spots the supply and demand of culture for the development of cultural, social and linguistic models, as standards of cognition and communication behavior. According to Giddens (1984) verbal expression is qualified as source of social and

[60] I kiss your hand!
[61] English: Have a nice day!
[62] Philosophical movement which studies primary instinct which doesn't take into account mental activity conditioned by social environment. French *phénoménologie.*
[63] Maximilian Weber (1864-1920) German sociologist who studied the part played by religion for the government nature and specific culture patterns.

cultural reconstruction able to show the relationship of the various social components. He explains the capacity of comprehension and cognition as a expression of power which is articulated language.

The arguments suggest language study as a perfect domain of *cross* to *trans* disciplinary approach which is strenghtened by the metaphor of Toni Morrison[64] who considers language as a measure of life due to its sensitive instrumentality for comprehension and knowledge.

5. Language, knowledge and cognition

Culture defined as knowledge is the the outcome of instruction process based on structural models of *perception, relationship* and *interpretation*. (Goodenough, 1956). Intellectual insights are associated to the the language which shows a theoretical and applied knowledge corpus. Theoretical knowledge corresponds to the specificity of individual and social experience, such *temperate climate has four seasons, seven year children go to school,* but applied knowledge defines current human repply under certain specific circumstances. (Bârlogeanu, L, 2004). This knowledge content is defined by *know-how*, i.e. what is the human expected feed-back under the current specific cultural environment which is made possible by the language itself, as a knowledge and behavior code. This knowledge is socially shared and turns into a regulator of the social interraction[65] inspite of individual opinions and interpretations. It is the language itself to keep alive general approaches, linguistic practices which are specific to the cultural structues it represents. Wallace (1961) is the one who makes reference to this reality by introducing the concept of diversity as an approach to *cultural individuality* showing culture capacity to preserve its identity due to its intrinsic diversity.

The following sample of a complex word analyses, in terms of *cross* and *trans* disciplinarity, develops comprehensive cognitive dimensions of English culture and civilization. The following term sample analysis follows the statement of Anton Dumitriu (1942) who claims that internality of hiden reality is to be revealed by external knowledge. New advanced characteristics emerge from language system as a result of interaction and dynamic relationship which develop a new systemic level with new characteristics and a better functionality and adds new integrated inherent features.

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[64] American writer, Pulitzer and Nobel awarded. Her sentence is part of her speech on the occasion of her literature Nobel award in 1993. („We die. That may be the meaning of life. But we do language. That may be the measure of our life")

[65] The statement belongs to Edwin Hutchins who considers that the unit of cognitive analysis needs to include both human and material resources making together the social and culture practices integrated.http://vserver1.cscs.lsa.umich.edu/~crshalizi/reviews/cognition-in-the-wild

The up-dated emerged conceptualization of the English *fair* makes comprehension go beyond current *cross* knowledge of the linguistic dimensions. The following diagram of an emergent conceptual semantic wholeness is based on four distinct sociological, aesthetic, occupational, and moral English language dimensions. The following polyvalent logic analysis makes possible an extended rationality of phenomenal forms which are not directly accessible, i.e. from these definitely clear-cut features. (Băiculescu, 2015) The emergence of the new systemic language structure is comprehensibly developed as a whole.

The four semantic values of *fair* represent *cross* disciplinary approach shifted to *trans* disciplinary language research which operate in terms of applied knowledge and comprehension based on a logical dynamism of emergent inference[66].

Figure 4 Semantic values of *fair* raised from logical dynamism or emergent inference of the English culture and civilization based on the *trans* disciplinary approach to language analysis and teaching

The development of a *cross* into *trans* linguistic interpretation reveals distinct and multiple semantic accumulation of terms which trace back historical collection of social and moral attitude, professional expertise, aesthetical options and artistic views making a whole life philosophy of early Germanic settlers in the Northern European area.

Both *cross* and *trans* cultural analysis acknowledges the capacity of language to preserve cultural identity of a nation based on its specific semantic diversity of the community verbal practices. The *cross* analysis made *trans* knowledge process is labored and strenghened by language study as a result of human sense and sensibility.

[66] Nils A. Baas, Claus Emmeche, (1997), *On Emergence and Explanation*, Intellectica, no. 25, pp.67-83, http://www.nbi.dk/~emmeche/coPubl/97d.NABCE/ExplEmer.html, pp.11-12.

Conclusions

Our article diagnoses the *cross* and *trans* referential analysis of language in tems of the various philological, sociological, philosophical and arts subjects, to reveal the complexity and efficiency of language, as a knowledge and cognition development instrument. The language analysis, as a mirror of culture and culture practices, leads to the comprehension of linguistic form and contextualized individual, social and professional relationship. The human intersection with the socio-cultural complexity entitles linguistic expression as a source of the cultural universe reconstruction. This universe is developed by the language instrument which empowers many other universes beyond the immediate meanings, through their referential contents.

As a result, the extension of linguistic research based on a *trans* disciplinary perspective makes use of the theoretical and operational word capacity to raise and enlarge critical thinking and sensible knowledge showing maturity and freedom of consciousness in terms of the professional and cultural identity.

Our work, dedicated to the development of a an effective applied language teaching philosophy, based on a *cross* and *trans* disciplinarity approach, proved its capacity to minimize and invalidate individual perception of knowledge, and make it open, wholesome and complex and produce not only specific, but general and transversal competences. Our triadic perception on semiotics and comprehension practices – linguistic sign, world and reference - raise language awareness and drive *trans* significance out of knowledge and produces knowledge continuity for professional and social transformation.

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