Florentin Smarandache

Law of Included Multiple-Middle & Principle of Dynamic Neutrosophic Opposition

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Contents

EXPLANATION

The following dialogues are a compilation of different dialogues I had – during the years – on neutrosophy and related topics with academic colleagues, mostly by email.

As they were non-protocol dialogues, initially not intended for publication, I invented a fictional character (somehow resurrected from Plato's dialogues), Filokratos, and put in his mouth opinions, ideas, questions, comments expressed by academic fellows, in a collective spirit.

Many thanks to all friends and dialogue partners who paid attention to neutrosophy and connected areas.

F. S.

SHORT DEFINITIONS OF NEUTROSOPHICS (Preface)

For the readers who are unfamiliar to the neutrosophics, we present below the main ideas about them.

1. Neutrosophy is a new branch of philosophy that studies the origin, nature, and scope of neutralities, as well as their interactions with different ideational spectra. See http://fs.gallup.unm.edu/neutrosophy.htm.

Etymologically, neutro-sophy [French neutre < Latin neuter, neutral, and Greek sophia, skill/wisdom] means knowledge of neutral thought. The term was coined by the author.

This theory considers every notion or idea <A> together with its opposite or negation <antiA> and with their spectrum of neutralities <neutA> in between

them (i.e. notions or ideas supporting neither <A> nor <antiA>). The <neutA> and <antiA> ideas together are referred to as <nonA>. Neutrosophy is a generalization of Hegel's dialectics (the last one is based on <A> and <antiA> only).

According to this theory every idea <A> tends to be neutralized and balanced by <antiA> and <nonA> ideas - as a state of equilibrium.

In a classical way <A>, <neutA>, <antiA> are disjoint two by two.

But, since in many cases the borders between notions are vague, imprecise, Sorites, it is possible that <A>, <neutA>, <antiA> (and <nonA> of course) have common parts two by two, or even all three of them as well.

Neutrosophy is the base of neutrosophic logic, neutrosophic set, neutrosophic probability, and neutrosophic statistics that are used in engineering applications (especially for software and information fusion), medicine, military, airspace, cybernetics, physics.

The neutrosophics were introduced by the author in a 1995 manuscript.

2. Neutrosophic Logic is a general framework for unification of many existing logics, such as fuzzy logic (especially intuitionistic fuzzy logic), paraconsistent logic, intuitionistic logic, etc. The main idea of NL is to characterize each logical statement in a 3D Neutrosophic Space, where each dimension of the space represents respectively the truth (T), the falsehood (F), and the indeterminacy (I) of the statement under consideration, where T, I, F are standard or non-standard real subsets of]-0, 1+[with not necessarily any connection between them.

As a particular case, one can split the Indeterminate I into Contradiction (true and false), and Uncertainty (true or false), and we get an extension of Belnap's four-valued logic.

Even more, one can split I into Contradiction, Uncertainty, and Unknown, and we get a five-valued logic.

In a general Refined Neutrosophic Logic, T can be split into subcomponents T_1, T_2, ..., T_p, and I into I_1, I_2, ..., I_r, and F into F_1, F_2, ...,F_s, where p+r+s = n ≥ 1. Even more: T, I, and/or F (or any of their subcomponents T_j ,I_k, and/or F_l) can be countable or uncountable infinite sets. See this most general published case at http://fs.gallup.unm.edu/n-valuedneutrosophiclogic.pdf.

For software engineering proposals the classical unit interval [0, 1] may be used.

T, I, F are independent components, leaving room for incomplete information (when their superior sum < 1), paraconsistent and contradictory information (when the superior sum > 1), or complete information (sum of components = 1).

As an example: a statement can be between [0.4, 0.6] true, {0.1} or between (0.15,0.25) indeterminate, and either 0.4 or 0.6 false.

The distinctions between Neutrosophic Logic/Set and Intuitionistic Fuzzy Logic/Set is explained in http://fs.gallup.unm.edu/ifs-generalized.pdf.

3. Neutrosophic Set. Let U be a universe of discourse, and M a set included in U. An element x from U is noted with respect to the set M as x(T, I, F) and belongs to M in the following way: it is t% true in the set, i% indeterminate (unknown if it is) in the set, and f% false, where t varies in T, i varies in I, f varies in F.

Statically T, I, F are subsets, but dynamically T, I, F are functions/operators depending on many known or unknown parameters.

Neutrosophic Set generalizes the fuzzy set (especially intuitionistic fuzzy set), paraconsistent set, intuitionistic set, etc.

4. Neutrosophic Probability is a generalization of the classical probability and imprecise probability in which the chance that an event A occurs is t% true - where t varies in the subset T, i% indeterminate - where i varies in the subset I, and f% false - where f varies in the subset F.

In classical probability n_sup <= 1, while in neutrosophic probability n_sup <= 3+.

In imprecise probability: the probability of an event is a subset T in [0, 1], not a number p in [0, 1], what's left is supposed to be the opposite, subset F (also from the unit interval [0, 1]); there is no indeterminate subset I in imprecise probability. A book on Introduction to Neutrosophic Probability is here: http://fs.gallup.unm.edu/neutrosophicmeasureintegralprobability.pdf.

5. Neutrosophic Statistics is the analysis of events described by the neutrosophic probability.

The function that models the neutrosophic probability of a random variable x is called neutrosophic distribution: NP(x) = (T(x), I(x), F(x)), where T(x) represents the probability that value x occurs, F(x) represents the probability that value x does not occur, and I(x) represents the indeterminate / unknown probability of value x.

A book on Introduction to Neutrosophic Statistics can be downloaded from http://fs.gallup.unm.edu/neutrosophicstatistics.pdf.

Conclusion

A large variety of applications of the neutrosophics in engineering, information fusion, and computer science made the object of tens of books and Ph D dissertations and hundreds of papers throughout the world.

INCLUDED MIDDLE vs. INCLUDED MULTIPLE-MIDDLE & DYNAMIC OPPOSITION vs. NEUTROSOPHIC DYNAMIC OPPOSITION

FLORENTIN SMARANDACHE

The neutrosophic logic – similarly the neutrosophic set, neutrosophic probability – can be treated depending on the problem:

a) If you want a dynamic form, then NL(proposition) = (T(t),I(t),F(t)), where T(.),I(.),F(.) are functions of time t, hence varying in terms of time t.

b) If you want to study a static problem, then T,I,F are fixed (they don't depend on time), and one has: NL(proposition) = (T,I,F).

This is the way neutrosophy looks at changes. Some changes may depend on other parameters, not necessarily on time only. For example, they may depend on space.

The included middle of Lupasco-Nicolesco system is the intermediate component, neither true nor false, I (=indeterminate).

If you want the dynamic problem, then I depends on time t, i.e. I(t), thus the included middle is varying in between T(t) and F(t).

Everything depends on what problem you study, hence there could exist situations when I(t)=constant.

FILOKRATOS

What about axioms?

FLORENTIN SMARANDACHE

I did not look into axiomatization, because the proposal of neutrosophic logic, set, probability were practical (applications). I work with a group of engineers. They

ask: what is this system important for? How do you apply it? They consider the philosophers are... useless thinkers!

I used non-standard analysis just to make a distinction between absolute truth and relative truth in philosophy, but this is not used in engineering applications.

To define the axiom of choice on neutrosophic sets, that is a little confusing, since there is not a specific definition for disjoint neutrosophic sets – because of the middle component.

FILOKRATOS

The major contribution of Lupasco was to show that – given that the world, including statements, is composed of energy, and energy is described by the second Law of Thermodynamics, the Pauli exclusion principle and the Heisenberg Uncertainty Principle – the applicable logic is not only non-binary, but that the actualization of any phenomenon A potentializes its opposite non-A, and alternatively, vice versa.

At the intermediate point, where each is half-actualized and half-potentialized, one has a point of maximum contradiction, which Lupasco calls the T-state – for 'tiers inclus' (included middle).

FLORENTIN SMARANDACHE

Let's be aware that this looks similar to Lukasiewicz's trivalent logic: 0,1, and 1/2, for respectively false, true, and indeterminant (the point of maximum contradiction).

FILOKRATOS

Thus the "logic of Aristotle" is adequate for simple systems, while those with internal dynamics – from which results an emergent T-state (quantum, both particle and wave, consciousness, art, social systems, etc.) – require abrogation of both the second and third axioms of classical logic.

FLORENTIN SMARANDACHE

These axioms (and others) are abrogated in many non-classical logics.

FILOKRATOS

Since this "logic of emergence" goes beyond both the intuitionist logic of Brouwer and the paraconsistent logics of Da Costa, Priest and yourself.

It could be called a "transconsistent" logic.

FLORENTIN SMARANDACHE

Neutrosophic logic generalizes intuitionistic logic (logic that supports incomplete theories), paraconsistent logic as well, dialetheism, faillibilism, etc.

In neutrosophic logic, a proposition is T% true, I% indeterminant, and F% false, where T,I,F are subsets of the non-standard unit internal]-0,1+[. Neutrosophic logic distinguishes between relative truth – which is truth in some worlds, but not in all possible worlds –, and absolute truth, which is truth in all possible worlds. It doesn't seem that Lupasco treats this difference.

In my opinion, Lupasco's logic can be included in the neutrosophic logic, since Lukasiewicz trivalent logic is included in it as well.

What you call "transconsistent" is similar to "paraconsistent" – and close to "dialetheism".

FILOKRATOS

In the meantime, I realized that the field of imprecise probabilities must have a relation, directly or indirectly, to the logic of Lupasco, in particular, to the values of actualization, potentialization and T-state which, in Lupasco, replace the usual truth table values of "truth" and "falsity", 0, 1 or something in-between. I then looked up "imprecise probabilities" on the Internet, found references to previous symposia and your articles.

(In ISIPTA '99, R.F. Nau wrote: "All subjective probabilities are intrinsically intersubjective in nature and do not represent beliefs that exist in vacuum. ... only

via modeling of the intersubjective dimension (can) the aggregation of probabilities be justified and carried out in a non-arbitrary fashion." This is very much in the spirit of the above.)

FLORENTIN SMARANDACHE

I have generalized the imprecise probability to neutrosophic probability, which uses a tridimensional vector as value, and entangles the probability axioms.

See my book:

http://www.gallup.unm.edu/~smarandache/eBook-Neutrosophics2.pdf, and at the end you get this neutrosophic probability.

It is more and more clear that Lupascu is Lukasiewics trivalent logic presented in a more philosophical way.

In imprecise probability, the probability is not a number between 0 and 1, but an interval included in [0,1], having a lower probability and an upper probability.

FILOKRATOS

I am interested in the system of Lupasco and Nicolescu because it provides a view of man and nature which is grounded in the best science of the 20th Century, and at the same time avoids all dogmatism and fundamentalism.

FLORENTIN SMARANDACHE

I think differently: the best used logic system in the 20th century is Zadeh's fuzzy logic system, and many cybernists, researchers, science experts are using it – and fuzzy set theory.

Neutrosophic logic is a generalization of the fuzzy logic, while neutrosophic set is a generalization of the fuzzy set.

Now I am working with engineers, and we are applying the neutrosophic logic in decision-making, meaning decisions based on uncertain, vague, contradictory

information – not even the fuzzy logic could deal with contradictory/ paradoxical information.

FILOKRATOS

Unfortunately, most logicians have ignored Lupasco's work either because he wanted it to apply too broadly (i.e., not only to propositions), its lack of formalism or both. After the 2000 Conference at Iasi, its organizer, Petru Ioan, published some additional formalism in his "Ştefan Lupaşcu şi cele trei logici ale sale". (This is not only inaccessible to me, but Nicolescu has criticized Petru Ioan for not seeing that the values of actualization, etc. are not scalars, but vectors or tensors.)

FLORENTIN SMARANDACHE

I agree with Nicolescu that vectors or tensors would be more general than scalars.

FILOKRATOS

With regard to your biography, I am surprised that there has been no direct connection between yourself and Basarab Nicolescu. You only say you refer to Lupasco and to him in one of your books.

Even only reading the biography, I am convinced that there could be an extraordinary synergy between the humanist, anti-totalitarian philosophies of action that are supported by your mathematics and physics respectively, and poetry! The transdisciplinarity of Nicolescu is not morally neutral; logic and the dialogue on logic represent approaches to action for social justice and needed changes in education.

FLORENTIN SMARANDACHE

I understand the transdisciplinarity as a multi-structure and multi-space: to find common features to uncommon entities, i.e., <A intersected with <Non-A is different from the empty set, even if they are disjoint.

FILOKRATOS

The key question for me remains to what extent your system of logic, set theory, etc., could integrate the Lupasco concept of dynamic opposition.

FLORENTIN SMARANDACHE

In the definition of neutrosophic logic it is said that the parameters T,I,F depend on many parameters like: time (therefore dynamicity), space, subjectivity, etc.

In a paper I worked with an engineer, we fusion (interact) paradoxical/opposite data.

FILOKRATOS

Then "neutrosophy" can be regarded as a generalization of Hegel's dialectic.

FLORENTIN SMARANDACHE

That is right. Neutrosophy is the base of neutrosophics (logic, set, probability, statistics) starting from dialectics.

FILOKRATOS

I believe, although I have just started looking into this, that there is a relation of considerable mutual interest between S. neutrosophic logic and the Lupasco-Nicolescu logic of the included middle, although S. does not refer explicitly to his "neuter" term as an included middle.

FLORENTIN SMARANDACHE

Neutralizing in neutrosophy comprises the included middle as well. In the definition of the truth value of a proposition/idea in neutrosophic logic, Lupasco's included middle is comprised in the "I" subset (indeterminacy, vagueness, unclear bound, paraconsistent).

FILOKRATOS

What should be of high interest is the way that you generalize all non-classical logics including dialetheism. I saw not many references to that in scientific publications.

FLORENTIN SMARANDACHE

Neutrosophics started in 1995 in my e-mails with Charles T. Le and others, but it was published in hard copy and put on the web in 1998.

FILOKRATOS

My current view, subject to much, much further work, is that the "transconsistent" system of Lupasco-Nicolescu remains the preferred one for the complex, emergent phenomena of the real world, where as the your generalization may be the best for propositions (not the process), modeling, and abstract entities in general.

FLORENTIN SMARANDACHE

We should not see this a battle among logics (Lupasco-Nicolescu's, Priest's paraconsistent, or neutrosophic), but a mutual understanding, cooperation, and best: unification.

As well, we should see the practical importance of neutrosophic logic: its application in engineering (expert systems, cyber-space, decision-making, neural network), while other logics are rather only theoretical!

But neutrosophic logic can successfully be used in any phenomena of the real world. It has a flexible definition.

FILOKRATOS

I am convinced that neutrosophic logic is the preferred logic of propositions qua their content as beliefs, involving indeterminacy as a third term, models, and paradoxes as abstract entities, equivalent to mathematical entities and imaginary objects. Lupasco stated that a contradictorial epistemology was needed, but he never developed one!

FLORENTIN SMARANDACHE

I initiated and developed a paradoxical epistemology in neutrosophy (see the first part of the book).

I analyzed contradictory ideas throughout some chapters of philosophy, sociology, psychology, literature regarding schools or individual thinkers, and I showed that all of them were right, even if they defended opposite statements.

More, I showed that various degrees of combination of contradictory ideas could lead to truth value in a certain reference system.

Of course, the study is only incipient, because a whole team should research through all thinking ideas and movement for contradictory manifestations.

FILOKRATOS

I can also agree that indeterminacy can be considered as points (or sub-set of functions/operators) involving contradiction and from this point of view the Lupasco logic looks like an extended version of Lukasiewicz, involving the principle of dynamic opposition.

Your concept of non-standard intervals and non-standard sub-sets can be used in Lupasco-Nicolescu, only the "values" must be between <1 and >0, since 1 and 0 correspond to idealized, limited (classical) cases for complex phenomena involving internal dynamics.

FLORENTIN SMARANDACHE

In fuzzy logic, 1 and 0 correspond to the truth and falsehood respectively.

Leibniz used this syntagme "all possible worlds".

In neutrosophic logic I went further and made a distinction between relative truth (truth in at least one possible world, but not in all possible worlds), NL(proposition)=1, and absolute truth (truth in all possible world) NL(proposition)=1+, which actually means 1+epsilon, as in non-standard analysis.

Similarly for relative/absolute falsehood and relative/absolute indeterminacy.

I think that this notation would be better than Lupasco-Nicolescu's logic, and also it is easier to infer ideas, contradictory or plausible, relative or absolute.

FILOKRATOS

I would now say that the relationship between the respective systems is more complex than that of inclusion of one in another.

FLORENTIN SMARANDACHE

I couldn't agree more.

FILOKRATOS

The Lupasco logic is similar to Priest's dialetheism, in that it is paraconsistent and accepts true contradictions, but it does so primarily for the real world and requires application of a logic of a real included middle, which in turn requires another level of reality to resolve the contradictions simultaneously (not like Hegel). I thus feel it goes farther than dialetheism and it is "transconsistent".

FLORENTIN SMARANDACHE

Neutrosophic logic also can deal with dialetheism and paraconsistency.

For example:

NL(A)=([0.3-0.4],[0.5-0.7],(0.6-0.8)), therefore the sum of superior components 0.4+0.7+0.8>1, which means there are contradictory sources of information sending us "weights" about the truth, indeterminacy, and falsehood components (otherwise the sum of components would be 1 as in fuzzy logic).

Or NL(paradox)= (1,I,1), which means a proposition which is true and false in the same time.

FILOKRATOS

I feel that the "ontologic" of Lupasco and Nicolescu, based on the principles of dynamic opposition, the logic of the included middle and levels of reality is the

logic of energy and, accordingly, the preferred logic of experience and complex, real-world emergent phenomena.

FLORENTIN SMARANDACHE

Neutrosophic logic is merely a tool of measuring the truth.

FILOKRATOS

These include beliefs qua the processes of their conception and interaction (including this one) and the use of contradictions and paradoxes in art (paraDoXism).

FLORENTIN SMARANDACHE

In paradoxism, I did an excessive use of antinomies, oxymorons, paradoxes, antitheses, contradictions, and this avant-garde movement was inspired from a totalitarian society where something was said officially, but in reality the opposite happened!

FILOKRATOS

On the other hand, your introduction of anti-A and non-A may answer a problem I have had with the classification of opposites, or contradictory elements. My new idea after seeing this is that anti-A and non-A are linked dialectically, the actualization of the non-A aspect potentializing the anti-A and vice versa.

Lupasco may have had something like this in mind when he used the phrase "adéquatement contradictoire".

FLORENTIN SMARANDACHE

Anti-A is included in Non-A. Non-A is a union of Neut-A and Anti-A. Non-A means what is not A. Neut-A means what neither A nor Anti-A. Maybe Lupasco's "adéquatement contradictoire" could be Anti-A, while only "contradictoire" could be Non-A, although Neut-A doesn't signify "contradiction".

FILOKRATOS

There are an enormous number of things to be said about your neutrosophy, in which I see many affinities in spirit to Lupasco-Nicolescu.

For example, on p. 56 where you ask: "Is there an internal term of the essence of things which implies the appearance of term external to them?", I answer YES, absolutely! I believe that Lupasco has provided a very useful framework for a discussion of the dynamics of energetic processes, focussing on the mechanisms, active verbs like "appear", "become".

Note also that Lupasco speaks not only to "heterogeneity being homogenized (globally, entropically)" but also to "homogeneity being heterogenized (locally, negentropically)" and, finally, as pointed out by Nicolescu, to the levels – the microphysical and the psychological – where these are at a point of semi-actualization and semi-potentialization and T-states at a higher level emerge.

FLORENTIN SMARANDACHE
Neutrosophy = paradoxist/contradictory epistemology somehow.
FILOKRATOS

Does your system involve an included middle in the real world, i.e., not only as an extension of Brouwer's use in mathematics?

FLORENTIN SMARANDACHE

Yes, the neutrosophic system comprises in a larger form the included middle, i.e. in the subset I (indeterminacy or neutralization). I consider this included middle as a subset, not as a point, for a more fluctuation of contradictions' annihilation needle – where is floating/moving the spark that springs forth from each contact of two contradictions.

Neutralization means resolution of contradictions, of course at a particular degree.

FILOKRATOS

If so, would you agree with the Lupasco description of art, for example, as an included middle involving maximum contradiction between real and non-real elements?

FLORENTIN SMARANDACHE

Not only maximum contradiction between real and non-real elements, but various degrees of contradictions (when I say "various degrees", it may even be zero). This included middle may represent not only unification of contradictions, but ambiguity, vagueness, paraconsistency.

In the neutrosophic system there exists a dynamicity, a continuous transformation between <A> and <Non-A>, an organic melange between them.

Thus, it is not only a dynamic of <A> and <Anti-A> as in Lupasco's logic of emergence, i.e. dynamic of contradictions, but also a dynamic of <A>, <Anti-A>, and <Neut-A> too – because the neutral ideas can influence and change or deviate

<A> too; actualization of <A> involves potentialization of both <Anti-A> and <Neut-A>.

A simple example can be given in voting procedure: one can vote for <A>, or against <A>, or: either one does not vote at all (absentism), or one votes, but not marks any candidate on the bulletin vote or one marks many candidates on the same vote (blank vote), or one votes and cuts all candidates on the same vote (black vote) [i.e. this is <Neut-A>]. Then, what's the included middle here? Did Lupasco-Nicolescu's logic catch this multiple aspect?

FILOKRATOS

Can such included middles (T-states) thus be considered as emergent states involving downward causality?

FLORENTIN SMARANDACHE

What is the relationship between cause-effect and T-states? The dynamic of contradictions is a cause for the included middle, which, trying to resolve the

contradictions, reduces the causality for a while. But in neutrosophy, <A> and <Anti-A> partially interchange and became <A'> and <Anti-A'>, and thus again the cycle restarts, and the causality is upward. A continuous fluctuation.

FILOKRATOS

In fuzzy logics I have looked at, always superficially I'm afraid, starting with Lukasiewicz, the values between "0" and "1" are simple or complex (as in Smarandache). In Lupasco, they are partly actualized and partly potentialized "entities", such that the actualization of one means the potentialization of its contradiction. Is this relationship real and if so how can it be expressed in your system (entanglement)?

FLORENTIN SMARANDACHE

In the neutrosophic system the entities are partially actualized, partially potentialized, and partially neutralized. We deal with a continuously infinite value logic.

The partiality is in diverse degrees from 0 to 1 in each case. If the sum of components is < 1, then one talks about intuitionistic system, and if it is > 1 – about paraconsistent system.

FILOKRATOS

How does affectivity enter your system? Lupasco believes affect is a-logical, i.e., does not involve contradiction, but is part of "être" – while everything logical (real world, energy- related, contradictorial) is the "non-être". I do not agree fully with this, and see emotion as a high-level emergent T-state.

FLORENTIN SMARANDACHE

I am consistent with and confident in my neutrosophy, that everything has a part <A>, another part <Anti-A>, and then <Neut-A>. I think that affect is a-logical, logical, and none.

This is my opinion, you're free to deny it – for the sake of the contradictions dynamic!

Neutrosophic logic is a non-standard non-classical logic.

Voire un volume de poèmes en français, LE SENS DU NON-SENS, à
http://www.gallup.unm.edu/~smarandache/LeSensDuNonsens.pdf
et un autre d'anti-poesies à
http://www.gallup.unm.edu/~smarandache/Antichambres.pdf
sur la contradiction poetique, sur l'anti-sens dans la langue française, où les clichés sont interpretés a l'envers! [L'opposition aux des classiques...]

In the arts, similarly, see the OUTER-ART manifestos at:
http://www.gallup.unm.edu/~smarandache/a/outer-art.htm

Outer-Art is a movement set up in 1990 (as a protest against random modern art, where anything could mean... art!) focusing on making art as ugly as possible, as wrong as possible, and generally as impossible as possible.

It is an upside-down artwork: to do art in the way it is not supposed to be done!

As you see, the fight between contrary ideas in poetry and art: when a creator imagines something, another does the opposite, while the majority are ignorant (<A>, <Anti-A>, and <Neut-A> respectively).

FILOKRATOS

THIS IS AN EXTREMELY IMPORTANT STATEMENT. It says to me that <Neut-A> may refer to what is outside the operation of the Principle of Dynamic Opposition in specific situations. At least potentially, A and Anti-A might agree and produce a creation which embodies the creative ideas of both. The "majority" will never, except extremely indirectly, be influenced by the dynamics of this creative activity! I need to go back to your treatment of Neut-A and see how this plays out in other examples.

FLORENTIN SMARANDACHE

My French poems are very paradoxical, you can compare them with Barbier's or Nicolescu's. They are based on linguistics anti-cliché interpretations and on anti-

logic [as in outer-art, which is art outside of art – therefore inner and outer interferer/intersect –, and which is based on the opposite of art: ugliness, badness, wrongness, etc.]. What do you think about such creations?

Lupasco was considered creator of a monist energism. The antagonism creates the energy, which generates dynamic systems.

FILOKRATOS

Not exactly. Energy exists and it is inherently antagonistic. Consequently, all systems are also.

FLORENTIN SMARANDACHE

He considers three fundamental types of systems:

- macrophysic dominated by homogeneous;
- macrophysic dominated by heterogeneous;
- microphysic entangled by both homogeneous and heterogeneous.

Am I right?

FILOKRATOS

I would say "biological" for "macrophysical dominated by the heterogeneous".

Your use of entanglement could lead to confusion with the quantum mechanical principle of entanglement. I would prefer: microphysical and psychological, involving dynamic opposition between a global trend toward homogeneity and a local trend to heterogeneity.

FLORENTIN SMARANDACHE

Nicolescu's levels of reality is a spiral generalization. I used in neutrosophy:

  - 1st cycle: from <A> in it is involved <Anti-A> and <Neut-A>, that organically transcend (interchange, deviate);

  - 2nd cycle: the new resulted <A'> would involve now the apparition of <Anti-A'> and <Neut-A'>, and so on;   the process is indefinite.

FILOKRATOS

Nicolescu says the process is open, transfinite, therefore indefinite.

FLORENTIN SMARANDACHE

Some ideas and comments:

- included middle is a point of equilibrium between opposite tendencies, as you said; in neutrosophy (N) I call this equilibrium: neutralization of opposites; included middle would be in <Neut-A>; <Non-A> = <Anti-A> ∪ <Non-A>; <Non-A> means what is not <A>, i.e. what is <Anti-A> or <Neut-A>; <A> ∪ <Non-A> = Universal set (but sometimes it is not equal);

- excluded middle in neutrosophic logic (NL) is the subset I (indeterminacy) or neutralization in neutrosophy;

- in NL the double negation principle does not work in general: <Non-(Non-A)> is not necessarily equal to <A>, especially if we deny at a later time the original <Non-A> is actually <Non-A'> and we deny a different proposition/idea, or we may use another negation operator at a time t2 different from the negation operator we have used at time t1; or in different spaces we have different

negation (and not only) operators; similarly <Anti-(Anti-A)> is not necessarily <A> in N and NL;

- in NL, using it a dynamic logic, <A> may not necessarily be equal to <A>, because after a while <A> becomes <A'> by mixturing <A> with <Non-A>;

- it might be possible to introduce a neutrosophic lattice on NL space;

- in NL, <A> united with <Non-A> does not necessarily equal to the universal set, especially in incomplete theories, where <A> ∪ <Non-A> is less (included) in the universal set; <Non-A> can also be interpreted as the complement of <A>; or, <A> ∪ <Non-A> could be greater than the Universal set (in paraconsistent theories, where the information is overflowing/flooding the universal set);

- in NL, <A> intersected with <Non-A> can be different from the empty set, as we observed it already; [please read the Addenda of notions derived from neutrosophics in my book, at the end];

- as a generalization, or a more complex formulation, actualization of <A> implies potentialization of both <Anti-A> and <Neut-A>, not only of <Anti-A>; I think this better reflects the reality; I mean, if an entity appears, not only its opposite arises, but neutral entities that would be compared with it as well; it is a triple inter-reaction;

- in N there are degrees of <Anti-A>, i.e. <Anti-A1>, <Anti-A2>, ..., I mean degrees of contradictions: some of them very antagonistic, others less;

- in N: from contradictions to non-contradictions (neutralization), then back to contradictions but at a superior level in an eternal duel;

- is it possible to make inference between <A> and <Non-A> in decision-making, cyberspace, etc. (what I am working on with Dr. Jean Dezert from France);

- when talking about degrees of actualization and potentialization, I would also add a degree of neutralization in the same time;

- from the Logic of Emergence to the Logic of DisEmergence I would say (Separation) in order to give room to evolution;
- for the Sorites Paradoxes: they should be consider in the fuzzy set theory, not in the fuzzy logic (because the boundary is not clear);
- "indefinite oscillation between <A> and <Non-A>" (Lupasco), yes, but <A> becomes <A'> and <Non-A> becomes Non-A'>, then oscillation between <A'> and <Non-A'> and so on at a higher level of evolution;
- Lupasco tried to set a contradictorial set theory; please read in my book an inconsistent set of axioms, and the consequences;
- you utter that the energy has the property of moving from diverse (heterogeneous) high-level forms towards a single (homogeneous) low-level for (heat), I would add: and vice versa;
- you state that each element of a set is a contradictory duality, composed of an element and its 'anti'-element, and I would add: the neuter part of it too.

In my opinion, N (and NL) is a generalization of Lupasco's logic, because:

- it distinguishes between relative truth and absolute truth, while LE doesn't;
- it can be applied in engineering (which is very important because has a practical application, it is not pure theory);
- it is more formalized, mathematicized;
- it generalizes the imprecise probability;
- it shows that dynamicity depends on operators and on hidden variables (hidden variables are intensively studied now in quantum physics);
- concretely defines infusion/inference between contradictory entities/ideas/ informations in a mathematical/scientific way (see the DSm Rule (formula) of combination of paradoxical data as part of the DSm Theory in a paper by Dr. Dezert).

FILOKRATOS

A basic principle of the Lupasco-Nicolescu system is that A and non-A is different from the empty set (although in this latter, they never are 100% disjoint).

FLORENTIN SMARANDACHE

In neutrosophy one goes even further: the intersection of <A> and <Anti-A> is different from the empty set.

As you know, <Anti-A> and <Neut-A> form the <Non-A>.

In the web, there is an old version of neutrosophic transdisciplinarity.

FILOKRATOS

From one point of view, the essential part of your Method is its principle of included (or embedded) indeterminacy.

Although you have now referred in several places to an included middle, you have not (yet; I hope you will do in your next notes) commented on "how one gets to" an included middle. In Lupasco, and, I think in reality, this requires the principle

of dynamic opposition, namely, that the actualization of A potentializes non-A (or anti-A or neut-A; this remains to be worked further).

FLORENTIN SMARANDACHE

Neutrosophic Logic concretely defines infusion/inference between contradictory entities/ideas/informations in a mathematical/scientific way (see the DSm Rule (formula) of combination of paradoxical data as part of the DSm Theory).

I mean this rule represents the concrete way of how getting from contradictions to Lupascu's T-state.

You talk about included middle as one point or goal.

Then, how do you describe the fact that <A> intersected with <Neut-A> is different from the empty set? As an included middle?

But <A> intersected with <Anti-A> as different from the empty set? Also an included middle? Thus, are there two included middles?!

I feel that this included middle is too narrow, I feel that this restrains our generality about world and life.

FILOKRATOS

Nicolescu has also described a Transdisciplinary Method, but Transdisciplinarity "lies through and beyond" all disciplines, including logic, although it is based on them.

FLORENTIN SMARANDACHE

I am afraid Nicolescu's transdisciplinarity method, described this way, is too idealistic, absolute, and hard to realize concretely – at least for this era. Going from theory to practice, that is a long way, sometimes impossible.

FILOKRATOS

Its finality is the open, Gödelian unity of knowledge.

FLORENTIN SMARANDACHE

Since it is possible to unite opposites, then what can stay in front of other forms of unifications? I tried to do it in logics, for example see my book: A UNIFYING FIELD IN LOGICS: NEUTROSOPHIC LOGIC.

FILOKRATOS

I believe your notion of truth itself is classical, even though your development is non-standard, non-classical. Since this affects the entire structure of both the Neutrosophic (NL) and Lupasco-Nicolescu (LNL) logical systems, we need to look at how Lupasco applied his principles to truth.

Although an included middle may be part of the I (indeterminacy) sub-set, I do not see what drives the ontology of the other things you see there – vagueness, unclear bounds, paraconsistency.

FLORENTIN SMARANDACHE

In my opinion, the dynamic of contradictions does not necessarily resolve them immediately and directly into an included middle.

The contradictions which attract (Marx) are fusioning and the result might be a chaos, unknown-ness, unclear theory, vague bounds of ideas for a while.

That's why I consider a subset (not a single point) I (indeterminacy), where as I feel that what Lupasco meant was a clear point of resolution of contradictions in included middle.

FILOKRATOS

Transdisciplinarity: unless we discuss this soon, the difference in how you and Nicolescu use this term will create difficulties.

FLORENTIN SMARANDACHE

Please be more specific and enumerate these differences.

FILOKRATOS

As I implied, I am concerned not so much with (logically) possible worlds, but with the only real one we have.

FLORENTIN SMARANDACHE

Considering all possible worlds we can deal with absolute and relative truth, falsehood, or indeterminacy. I don't know of any other way to get them.

FILOKRATOS

It is highly unlikely that any single approach would be the best for practical applications in computer science, immunology and mental illness.

But one thing is already clear. Although I do not think the included middle is a single point, some of the things I said may have sounded that way. But when I say that included middles (or T-states) are complex emergent phenomena, such as art and consciousness, I hope you will agree that any approach should be able to deal with them, and that these are not "single points".

FLORENTIN SMARANDACHE

Okay.

FILOKRATOS

Further, I believe it is correct to say that the included middle is indeterminate, or rather, is both determinate and indeterminate.

I will look carefully at the DSm [acronym for Dezert-Smarandache] system in Dezert's article.

FLORENTIN SMARANDACHE

It is an engineering way of getting (in)to the included middle from contradictions.

Look at the DSm Rule first (not Theory; the DSm Rule is a technical part of the DSm Theory), which is a formula explaining how to combine paradoxical (contradictory) data (information) to get (fusion) a belief function. Dr. Dezert gives some easy examples to understand. This paper is being published by the Bulgarian Academy of Sciences, where he presented it in August 2002.

FILOKRATOS

Your questions on anti-A and included middle(s) are also very important. The Lupasco resolution of A and anti-A (let's use this) produces an included middle, which, if real, must be at another level of reality, in a T-state. But this T-state can continue to interact contradictorily with other things, say, A itself. This would indeed produce a second included middle. One example is the "retroaction" of the medium used by the artist to produce the final "Art".

FLORENTIN SMARANDACHE

I must again agree with you.

FILOKRATOS

As for Transdisciplinarity selon Nicolescu, it may be idealistic, but it is directed at some pretty practical things.

Having looked again at Dezert's paper, and in the light of your remarks, I suggest that part of the difference in our "language" is that you have focused your

treatment (of indeterminacy and an included middle) on issues related to reasoning and belief. Thus, when Dezert says "The DSmT[1] takes into account in the combination process itself the possibility for uncertain and paradoxical information", I can easily relate this to Lupasco's idea of the processes of dynamic opposition applying to the operators of implication themselves.

FLORENTIN SMARANDACHE

The DSmT takes into account in the combination process not only uncertain and paradoxical information, but plausible information as well (see Dr. Dezert's paper title). Therefore, not only contradictions/oppositions as in Lupasco's logic, but normal information as well. Another difference is that Dr. Dezert found a specific/concrete rule (a mathematical formula) for a such implication (process).

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[1] Dezert-Smarandache Theory of Paradoxist and Neutrosophc Reasoning, used in information fusion, engineering, medicine, military, computer science, robotics, etc. See: http://fs.gallup.unm.edu/DSmT.htm.

FILOKRATOS

However, it is less easy to see how the DSm Rule applies to the real world and phenomena involving physical forms of energy rather than non-physical forms (information).

FLORENTIN SMARANDACHE

The DSm Rule is used, for example, in decision-making: thus the received paradoxical, unclear, incomplete, plausible information (I mean information received from various sources) is processed by this rule, and the result helps in making a decision, which will involve an action to the real world physical phenomena.

FILOKRATOS

We still seem to be talking at cross-purposes here. I do not totally disagree with this formulation. I only wish to point out that I am interested also in the logic of "real world physical phenomena", apart from the decision process. My view, and that

of Lupasco and Nicolescu, is that the application of classical logic to them has been a catastrophe, and the objective, once again, should be to try to make an alternative logic, which corresponds to the actual mechanics of life, more accessible to people.

FLORENTIN SMARANDACHE

You talk about a more theoretical logic, while I am focusing on an practical/ applied logic. DSm Rule can be used in neural networks (mental phenomena, as you say) for studying the brain activity, in robotics, in weather prediction. Decision-making was only an example in my previous sentence. I don't know anything more real and important than technology.

I did not see any concrete example of Lupasco-Nicolescu logic used in "real world physical phenomena". Please display one (but do not start using aphorisms, symbols, philosophical phrases or ideas... s'il vous plaît!); a practical example, I need.

FILOKRATOS

There is much to be said here. I will look for some examples, but not in the spirit of a "killer" example which you would accept automatically. In fact, there probably is none, since we have different views on what is important in life.

Nicolescu has specifically said that his approach, inevitably, will be changed and augmented. This is inevitable. However, one must be careful not to let Aristotelian logic creep back in via definitions, etc.

FLORENTIN SMARANDACHE

Everybody's ideas (mine and yours included) will be challenged, transformed, re-interpreted. Einstein is partially contradicted regarding his Theory of Relativity.

Apparition of <A> (= Theory of Relativity), potentialized apparition of <Anti-A> (= Anti-Theory of Relativity, or Theory of Anti-Relativity), plus the <Neut-A> (= indifferent people, persons who don't care, the majority). Now, they inter-react (all three categories), and in the future we should face a new resulting theory

<A'> (= Theory of Relativity adjusted, or maybe changed, deviated, re-interpreted). And the cycle will go on for ever: <Anti-A'> springs out, and then <A''>, <A'''>, ...

The cycle is more dynamic in arts, letters, and generally in humanistic fields, than in technical and scientific ones, due to subjectivity and flexibility of humanistic ideas unlike rigidity of technical and scientific ideas.

FILOKRATOS

The Test of Time.

The area of time could be an excellent one to compare and perhaps even combine our approaches. Here is a start:

a) In Priest's conception, the description and psychological feeling of the present is that it is a point ("point-instant", a Buddhist logical term) between the past and future. It is the specious present, something that is BOTH past and future, a dialetheia, a true paradox.

b) Brenner amplifies this by saying it is a "two-dimensional" paradox, not involving energy directly, and there is no T-state or included middle, but simply a conceptual oscillation from one term to the other.

c) My idea of your description, please comment, is that in this example, the value of the indeterminate sub-set is zero (or, if one prefers, no greater than the Planck time, 10e-43 sec).

FLORENTIN SMARANDACHE

The components T,I,F of a logical proposition in neutrosophic logic can be ANY subset of the non-standard unit interval]-0,1+[, by any subset one comprises the empty set too, the tiny set too, etc.

Only in faillibilism (a philosophical doctrine) it is asserted that all propositions have some degree of indeterminacy, but many philosophers disagree because the tautologies are considered 100% true, i.e. completely known (no indeterminacy).

However, in this particular case, the indeterminacy might exist because dealing with paradoxes depends on interpretation.

FILOKRATOS

Lupasco writes the following about time and space (in LE PRINCIPE DE L'ANTAGONISME ET LA LOGIQUE DE L'ÉNERGIE): " ... le temps, loin d'être une condition des phénomènes, comme le pensait Kant, est, inversement, conditionné par les phénomènes: un élément, un phénomène, précisément de par sa structure logique, dans le sens généralisé que nous donnons au terme logique, ne se déroule pas dans le temps, mais déroule un temps; il est, en tant qu'actualisation plus ou moins développée, la condition même d'un temps."

FLORENTIN SMARANDACHE

Je dirais, neutrosophiquement, que les deux se conditionnent reciproquement:

a) phénomènes → temps (Kant);

b) et temps → phénomènes (Lupasco).

Mais cela, contraire a la logique classique, ne signifie pas que les deux (phénomènes et temps) sont equivalents.

Vous savez qu'on pacifie les idées contraires en neutrosophie!

FILOKRATOS

Lupasco, loc. cit.: "Et comme une actualisation ne peut être infinie ou rigoureuse, ce qui éliminerait le dynamisme antagoniste dans une potentialisation infinie ou rigoureuse, une conjonction contradictionnelle demeure donc toujours présente au fur et à mesure que se déroule une actualisation quelconque, si bien qu'on peut dire que la temporalité logique qu'engendre l'énergie, dans sa dialectique contradictoire, est solidaire d'une spatialité qu'elle engendre par là même. L'espace, en effet, est l'espace d'un déploiement, c'est-à-dire, d'un dynamisme qui s'actualise ou se potentialise."

FLORENTIN SMARANDACHE

Je completerais "et qui se neutralise aussi".

FILOKRATOS

Lupasco goes on: "Ainsi, les phénomènes, quels qu'ils soient, ne se déroulent pas dans l'espace, mais déroulent un espace. Il n'y a pas d'objets dans l'espace, mais de l'espace dans les objets. L'espace, comme le temps, sont fonctions des éléments, plutôt des ensembles, des systèmes d'éléments."

FLORENTIN SMARANDACHE

Je ferais le même commentaire qu'au dessus: les deux (phénomènes et espace) sont fonctions les unes des autres, sans être équivalentes. De plus: les trois (temps, phénomènes, espace) s'impliquent reciproquement.

FILOKRATOS

"Ainsi donc l'espace logique comme le temps logique constituent un espace-temps propre à chaque ensemble, un espace-temps de configuration."

FLORENTIN SMARANDACHE

Je suis d'accord que chaque ensemble a ses propre temps et espace (et d'autres parametres cachés...).

FILOKRATOS

Now, my view is that this space-time should have a metric, and this metric will be associated with some indeterminacy, but the description will vary with the level of reality.

FLORENTIN SMARANDACHE

On the neutrosophic set one can define tridimensional norms or pseudo-norms (that comply to less axioms), which are specific for each problem to solve.

FILOKRATOS

Above, we looked at a "simple" paradox. At the quantum level, the metric of the "temps propre" of the particle might be related to the unit of velocity in the term

for momentum. For mental phenomena, there will be the "subjective" measure of time for "movement" between beliefs or judgements.

FLORENTIN SMARANDACHE

The subjective parameter may enter under indeterminacy component (i.e. not clear, or biased).

FILOKRATOS

IN GENERAL, ABOVE THE QUANTUM LEVEL, THERE WILL BE A SPECIFIC TIME ASSOCIATED WITH ALL METABOLIC PROCESSES, HUMAN OR OTHERWISE.

FLORENTIN SMARANDACHE

I agree with that. And a specific space. And specific hidden parameters (see in physics and chemistry).

FILOKRATOS

"NO METABOLISM, NO TIME". On this basis, there is no difficulty in distinguishing between my own "biological clock" and the clock in the computer I am using. In

complex phenomena, where there is metabolism, involving contradictions as do all energy-related phenomena, there will be emergent T-states and these will have/cause the times, or space-times described by Lupasco.

FLORENTIN SMARANDACHE

Now, are you sure that all contradictions are resolved? I doubt that! And, if so, are you sure that all of them are resolved through the included middle? Maybe <Anti-A> could be annihilated by or disappearing into its neighborhood neutralities. See below more examples:

A1) Suppose that person <A> guards an orchard of apples, and somebody, let's note him by <Anti-A> because is the opposite to <A>, wants to steal apples from the orchard, and tell that to a fellow/collegue, say <Neut-A> (somebody who is indifferent/neutral with respect to <A> and <Anti-A>). It happened that <Neut-A> has some extra apples and he gives enough of them to <Anti-A> who realizes that he has no more need of stealing apples from the orchard. Therefore, it was

an interconnection/dynamic between <A> and <Neut-A>, not between <A> and <Anti-A>, I mean there is no dynamic of oppositions.

A2) Now, suppose <Anti-A>, before telling anybody else his intention of stealing apples from the orchard, has a car accident and dies. Thus, the dynamic of oppositions has being solved without any included middle, just <Anti-A> disappeared (was transformed, was swallowed) into (by) neutralities (<Neut-A>). Of course, the car accident was not related in any way to stealing or not stealing from the orchard (to say that it was a dynamic between <Anti-A> and <Neut-A>), it was simply due to the hazard.

B1) Suppose that country <A> wants to go to war against another country, say <Anti-A>, but other countries (neutralities) convince both of them separately not to go war (there is no discussion/treaty between the two antagonistic countries, only between each antagonistic country and neutralities in a separate mode). In this case there is a dynamic between <A> and <Neut-A>, and another dynamic

between <Anti-A> and <Neut-A> too, therefore no dynamic of oppositions again, and thus two included middles – which was not taken in calculation by Lupasco.

B2) One may even have three included middles if, besides the above interconnections (discussions for reconciliation), there would be a direct interconnection between <A> and <Anti-A>.

I emphasize the need for the <Neut-A> to be taken into consideration in Lupasco's logic, and the "dynamic of contradictions" be updated to "dynamic of oppositions, neutralities, and hazard", otherwise it would be hard to cover all possibilities.

According to transdisplinarity itself, no system or theory is complete, therefore neither Lupasco-Nicolescu logic can be!

Thus, there must be some contradictions which are not resolved using this logic. Therefore, there is a paradox in the system.

FILOKRATOS

Perhaps you could comment, in this connection, on Dezert's statement that "the rule of combination (of evidence) is justified from the maximum entropy principle".

FLORENTIN SMARANDACHE

DSm Rule of combination provides a greater entropy than Dempster-Shaffer Rule (the most used nowadays) when dealing with paradoxical reasoning and it is a generalization of the last one.

About Lupasco's LE PRINCIPE D'ANTAGONISME ET LA LOGIQUE DE L'ENERGIE:

- "a truth cannot be absolute" assertion: there are philosophers that believe in the existence of absolute truth, for example the "tautologies" they say; others support the idea that absolute truth does not exist because, according to the definition, an "absolute truth" means a truth in all possible worlds, or one has infinitely many possible worlds, some worlds we may not even know about, therefore it is impossible to check it!

- "absolutely contradictory elements" assertion: there are degrees of contra-diction between two entities, from 0 to 180.

About "Transdisciplinarity": I feel that the transdisciplinaritarians are more poets and artists than scientists! "Article I: The transdisplinarity vision offers a concept of human being which is incompatable with any mere definition or reduction to formal structure." (Nicolescu)

Therefore the definition of transdisplinarity is: there is no definition for transdisplinarity! It looks like a puzzle, a play with the words.

It is a neutrosophic way/method of interpreting (and combining) opposite ideas.

I like in transdisplinarity:

a) "the impossibility of a self enclosed, complete theory of knowledge, thus avoiding all dogmatism and fundamentalism" (like Godel's incompleteness theorem);

b) "All is open-ended, incomplete and contingent, awaiting always the intervention and constructive collaboration of the viewer" (Roy Ascott);

c) and "unity of knowledge";

d) "The universal sharing of knowledge cannot take place without the emergence of a new tolerance grounded in a transdisplinarity attitude" (Basarab Nicolescu, Michel Camus);

e) there is a "reality which is 'distant' or 'veiled', that is, inaccessible to our senses or measuring instruments" (Bernard d'Espagnat); this may be connected with hidden parameters, and it gets room in my indeterminacy; then where do you locate this veiled world in Lupasco's logic?

f) yes, a tolerance of understanding is needed, a "change in mentality", a "reconciliation";

g) "theories dealing with non-linear dynamic systems, symmetry-breaking, self-organization, (...) dissipative structures" (Francisco Varela), and I would add 'self-disorganization';

- "the logic of dynamic opposition, and the included middle" (Lupasco, Nicolescu), considered one of the pillars of transdisplinarity; in a neutrosophic point of view, transdisplinarity is not transcended only through opposites but thorugh neutralities as well; and you should acknowledge that one needs to involve not only what is contradictory, but everything (all fields); in my opinion, this pillar should be updated;

Other related notes:

- they love composing words with the "trans-" prefix: transperception, transrepresentation, transdesign, transhumanism, transreligion, transhistory, transethics; what about transpoet, transwriter, or transmathematician?
- "transdesign thus refers to what is based on design, but lies through and beyond it"; this "lies through and beyond it" is too aphoristic, too difficult to implement (or does not provide any route for practical application); philosophy for the sake of philosophy;

- "logic of dichotomies": I would replace it with logic of trichotomies (because they all inter-react: <A>, <Anti-A>, <Neut-A>);
- "Transdisplinarity is completely paradoxical" (Rene Barbier); yes, if one "trans-" contradictory fields; no, if one "trans-" non-contradictory (neutrality) fields, n'est-ce pas?
- "totality in art" (DER HANG ZUM GESAMTKUNSTWERK, Zurich, 1984), as conveyed in transdisplinarity, is not possible because all is open-ended, incomplete, again conveyed in transdisplinarity; this is a transdisplinarity paradox!

"Transdisplinarity – considered as a method – is 'though matrix' for understanding what disciplines share and what lies outside them"; nice metaphor, but what practical example can be provided in order to support it?

Is transdisplinarity theory only? Or only very abstract?

Although, I agree with "reciprocal contaminations", and would say: between <A>, <Anti-A>, and <Neut-A>.

FILOKRATOS

Of course, no work of art could be a complete "Gesamtkunstwerk". That was pure idealism of the artists involved.

FLORENTIN SMARANDACHE

"The unification of all arts" (Richard Wagner), and more general the unification of all human knowledge fields, as a transdisplinarity goal, is impossible because nothing is complete according to the same transdisplinarity; this is a general transdisplinarity paradox!

I would extend Nicolescu "inner harmony" to "inner and outer harmony"; both of them are necessarily in order to neutralize/fix the contradictions.

Or: "Design is useless if it does not support a message leading to action" (Kalman); I agree, but unfortunately I didn't see any action resulting from design.

Even more: "Art is a lie, but in the service of truth" (Olson Welles); beautiful said, but I think 'art is also a truth in the service of truth' (for example, the realistic art), or 'art is a lie in the service of lie' (propagandistic art);

According to Lupasco, does the goal of art is seeking contradiction?! I don't think so, it depends on the type of art.

FILOKRATOS

If one applies Lupasco Principle of Dynamic Opposition to your system, one might say that there is a relation between T and F such that the actualization of T potentializes F and vice versa. At the point of semi-actualization and semi-potentialization of each, there is a state of maximum contradiction and an included third term (I) or system (T-state, at another level of reality) emerges. Of course, this works better where, instead of T and F, real phenomena are used as the terms.

FLORENTIN SMARANDACHE

I don't entirely challenge the Lupasco Principle of Dynamic Opposition, it works fine in many cases, but there are situations when this principle can not be applied.

Like any theory, Lupasco's has a specific domain where it is well defined and, in consequence, functions properly; outside of its domain, any theory risks to fail.

FILOKRATOS

Your notes started me thinking again about your True-Indeterminate-False formulation. I was sure you had captured something essential with your concept of Indeterminacy, but I had difficulty reconciling it with the Lupasco principle of dynamic opposition (with which I am comfortable as an ontologic of energy.)

FLORENTIN SMARANDACHE

Everybody analyzes the same thing from different perspectives/angles - that's why these cuts into an idea are somehow incompatible (horizontally versus vertically)... But we have common points as well.

FILOKRATOS

Now, I had identified your True and False with the degree of actualization (A) and potentialization (P) of a pair of contradictory phenomena, but what then would be the reference for Indeterminacy?

FLORENTIN SMARANDACHE

Indeterminacy would be the neutral part (in-between actualization and potentialization), i.e. the ideas neither actualized nor potentialized. Because, when an idea arises, we don't get only potentialization (opposition) to that idea, but also ignorance (neutralities which simply don't care about it, n'est-ce pas?!).

By indeterminacy I also understand the distance between (A) and (P).

FILOKRATOS

I also asked, why do Smarandache need non-standard intervals?

FLORENTIN SMARANDACHE

I use the non-standard subsets (not necessarily intervals - for being more general) in order to catch the absolute truth { NP(absolute truth = 1+ , where 1+ =

1+epsilon} as well, and to distinguish the absolute truth from relative truth { NP(relative truth) = 1 }; of course 1+ > 1.

Because I leave room to contradictory sources of information, I mean somebody (source S1) may asserts that the truth (or say degree of actualization in Lupasco's system) of an idea could be for example 0.7, source S2 can percept the falsehood of this idea as 0.8, source S3 believes from certain parameters that the indeterminacy of this idea may could be 0.4 [in many situations we don't have precise tools to measure the degree of truth, or of falsehood; here it is again needed the indeterminacy component].

We have to admit that there are different even contradictory/paradoxical opinions on various phenomena.

Why not renormalize them to the interval 0 to 1?

FILOKRATOS

In the case when there are not contradictory sources of information (or of analysis) we can normalize the sum of the three components to 1.

Actually I did not say that T+I+F=3, but T+I+F <=3 (which means the sum can be 1 too).

But the sum can be less than 1 as well for incomplete information/analysis on that idea: T+I+F<1.

Now I would like to suggest the following:

Lupasco, Nicolescu and Brenner have stated that the logic of the included middle applies to complex, dynamic systems whereas simple ones obey either Aristotelian logic or a simple paraconsistent logic (e.g., of paradox).

FLORENTIN SMARANDACHE

Lupasco, Nicolescu, Brenner extend and re-interpret Hegel's and Marx's dialectics. In fact, my neutrosophy goes on and also generalizes the dialectics.

Paraconsistent logic and the dialetheism (which says that some contradictions are true) use paradoxes, right.

Modern logics do not obey the Aristotelian logic, and in neutrosophic logic almost all classical principles (I believe all, but I did not check) are denied. not only the excluded middle!

By the way, the "Multiple-Valued Logic" international journal has dedicated the whole issue of June 2002 (Vol. 8, No. 3) to the neutrosophy and neutrosophic logic (about 200 pages): two papers by me, one by an American, and another one by a French. This means an international recognition of these new emerging terms.

FILOKRATOS

This implies that there must be a more or less continuous gradient of complexity between types of systems which requires some sort of metric.

FLORENTIN SMARANDACHE

I agree with this metric or, more general, this norm.

FILOKRATOS

Let us define for this purpose an interaction tensor which measures the degree of dynamic opposition from (almost) zero to (almost) 1.

FLORENTIN SMARANDACHE

I forgot to tell you that the neutrosophic operators are not fixed, but defined differently according to the problem of study. In conclusion, the negation operator (that one which brings Lupasco's potentialization of an actualized idea) may vary.

Therefore, even the contradiction (Lupasco's dynamic opposition) can be measured differently.

See an example:

Let M be an idea, we can say that NP(M) = (t,i,f) in an easy way. Then, the opposite of M, let's note it by Anti-M, will be evaluated as NP(Anti-M) = (f,i,t) in one

negation operator, but using another negation operator NP(Anti-M) = (1-t,1-i,1-f) which can normalized or not (the sum of components equal 1) according to the idea we study.

Thus, there are more types of contradictions for the same idea.

FILOKRATOS

At any point on this scale, the reciprocally determined values of actualization and potentialization will apply, and when each is equal to the other (= 1/2 interaction tensor), a T-state (included middle) may emerge from this point of relative maximum contradiction.

FLORENTIN SMARANDACHE

I see these reciprocally determined values of actualization and potentialization as converging towards each other and meeting in a limit point between 0 and 1, but the maximum contradiction is when actualization is closer to 1 and potentialization closer to 0 (the father they are from each other, the higher

contradiction). When they approach each other the degree of contradiction diminishes and disappears when they encounter (and formed a new idea).

Dynamics result from a continuous change of the degree of contradiction between actualization and potentialization – from a continuous oscillation of (A) and (P), which approach and go far from each other permanently (but finally they converge towards a limit point in between 0 and 1; of course they more approach than go far from each other).

The limit (A) and (P) converge to (as two sequences on numbers in mathematics) is not necessarily 1/2, but a number in the interval [0, 1], and this is because one idea (actualization) may balance/weight more or less than its opposition (potentialization). The limit depends on each specific idea. I see this limit as an organic (not mechanic) mixture of (A) and (P).

If (A) is stronger, has a lot of evidence, then the limit point will be closer to (A); if (A) doesn't have enough evidence and the percentage of truth is not that high, then the limit point is closer to (P).

There are cases in science when these dynamics of oppositions don't work as in Lupasco's logic. For example:

Suppose a conjecture <C> arises in mathematics, "Conjecture <C> is correct". This may be true or false. The opposite of this would be <Anti-C>, or "Conjecture <C> is incorrect". Researchers try to solve it, believing it is either true or false (oscillations, study = dynamics).

If somebody proves it is true, then the limit point of <C> and <Anti-C> is actually <C>, not a point in between [0, 1] and in particular not 1/2.

Similarly if it is proved that <C> is false then the limit point of the dynamics of <C> and <Anti-C> is <Anti-C> (these are cases of extreme right or extreme left limit points).

In other situations it may be no limit point at all (therefore no T-state) resulting from the dynamics between <M> and <Anti-M>.

This occurs for undecidable ideas/propositions (see the proof theory, Godel's Theorem of Undecidability), where one can not say much (or nothing) about the truth value of <M> neither about the truth value of <Anti-M>.

FILOKRATOS

THE NEW PRINCIPLE POSTULATES THAT INDETERMINACY IS INVERSELY PROPORTIONAL TO DYNAMICS!

FLORENTIN SMARANDACHE

Dynamics mean movement/change and speed. The bigger speed and the bigger the movement, the bigger dynamics.

Because by indeterminacy I understand the distance between (A) and (P), I would adjust the Lupasco-Smarandache-Brenner Principle as follows:

INDETERMINACY VARIATION IS DIRECTLY PROPORTIONAL TO DYNAMICS!

The more dynamics {oscillations/movements between (A) and (P)}, the more variation of indeterminacy. When (A) and (P) are approaching each other, the indeterminacy is decreasing, and reciprocally. When (A) and (P) meet in their limit point, the indeterminacy is zero. When (A) and (P) converge (contradiction decreases), indeterminacy decreases; and when (A) and (P) diverge (go far from each other, therefore contradiction increases), indeterminacy increases.

The following principles result:

a) INDETERMINACY IS DIRECTLY PROPORTIONAL WITH CONTRADICTION.

b) INDETERMINACY DYNAMICS ARE DIRECTLY PROPORTIONAL WITH LUPASCO'S DYNAMICS OF OPPOSITIONS.

c) INDETERMINACY CONVERGES TO ZERO WHEN LUPASCO-BRENNER ACTUALIZATION AND POTENTIALIZATION CONVERGE TO THEIR LIMIT POINT.

How can I explain this LSB principle?

The indeterminacy forms the neutral part, the part which is neither (A) nor (P), i.e., what is in-between. When an idea M arises (it's truth value is 1 or close to 1) (actualization), then its opposition has the truth value 0 or close to 0 (potentialization).

The distance between (A) and (P) is big, therefore indeterminacy is big (because the idea is not well known, there are many ignorant or neutral ideas in between).

Then little by little the potentialization increases (more opposition) and thus (P) is moving towards a limit point in between 0 ad 1, in the same time the novelty of this idea (actualization) decreases (thus moving towards that limit point). Because the distance between (A) and (P) decreases, the indeterminacy decreases too.

Of course, the idea M which arises, may sometimes be not close to 1, but its opposition Anti-A is kind the symmetric of this with respect to the middle point of the interval [0, 1].

But the distance between M and Anti-M is bigger at the beginning than later (whe they approach little by little).

I am pretty sure that not any particular idea M and its opposite Anti-A converge towards a limit point, they might never converge.

FILOKRATOS

This means that where there is no dynamics, just an ideal or abstract yes-no.

FLORENTIN SMARANDACHE

By dynamics I understand the permanent moving or oscillations of (A) and (P). Indeterminacy is maximum.

I would say that where is no dynamics, the indeterminacy is constant.

FILOKRATOS

There is no basis for deciding where one is in the "oscillation" between the two independent terms. Where the dynamics is essentially complete, as in a quantum particle or a real human conflict, Indeterminacy is essentially nil. Recall that the

Heisenberg Principle is one of (epistemological) uncertainty, but nothing is undetermined.

FLORENTIN SMARANDACHE

Indeterminacy comprises the uncertain, the vague, imprecise, unknown, unclear, ambiguous, undecided, hidden parameters from quantum theory, etc.

FILOKRATOS

Thus, Indeterminacy = 1 - Interaction.

COROLLARY. The less the dynamics, the lower the absolute probability of the emergence of a T-state, simply because the "degree" of overall oppositional energy is low.

I do not accept many of the principles of neutrosophic logic.

FLORENTIN SMARANDACHE

I am just curious: which ones don't you accept? Why, and counter-examples.

The only principle the neutrosophic logic has is that it does not accept any principle!

FILOKRATOS

Many of the things that you call indeterminacy, or neutralities, are considered by Lupasco as energetic phenomena governed by the rules of actualization and potentialization, for example ignorance.

FLORENTIN SMARANDACHE

Yes, the neutralities become more or less actualized or potentialized according as dynamicity of (A) and (P) interacts with them. Some neutralities are attracted in one side or another. The T-state, when it exists {because there are (A)s and (P)s for which no T-state results, as a sequence that has no limit}, is a combination of original actualized idea <M>, original potentialized idea <Anti-M>, and neutralities which were somehow involved in one side or another.

These actualization and potentialization from Lupasco look like the excitation and inhibition in Ancient Chinese yin-yang philosophy. Yang directs change and yin

implements it. I wrote a book with a Chinese professor, Feng Liu, from Xi'an University, about neutrosophy and daoism.

FILOKRATOS

When a new idea is formed, it effectively resolves the contradiction which previously existed (at a higher level of reality).

FLORENTIN SMARANDACHE

Not always a new idea is formed by resolution of previous contradictions.

For example, many times in science researchers do generalizations (i.e. extensions) of old ideas.

Therefore, they go on the same sense, and do not contradict it.

There is no contradiction here.

FILOKRATOS

You have a mathematical, not a physical/energetic concept of convergence.

FLORENTIN SMARANDACHE

My fault, yes.

FILOKRATOS

A proof of a conjecture is, exactly, a result of a contradictorial process leading to NON-contradiction, therefore certainly not at 1/2. I say (slightly) less than 1 because nothing is ever totally actualized or potentialized.

FLORENTIN SMARANDACHE

I was not referring only to conjectures, but to many resolutions of contradictions. Not always (A) and (Anti-A) meat at 1/2 (mid point, or T-state), but at various points between 0 and 1.

FILOKRATOS

Our ideas of how actualization and potentialization are so different that much work needs to be done to reconcile them in some way. There is no "distance" between some term "A" and some term "P". They do not move, it is the phenomenon-as-energy that moves in configuration space.

FLORENTIN SMARANDACHE

I see (A) as changing (moving) towards (P), and similarly (P) moving (changing) towards (A). Therefore, they become (A2) and (P2) respectively, then (A3) and (P3)... These are their conversions (approaches) little by little towards each other. You are basing your analysis on ENERGY, while I'm focusing on idea's (neutrosophic) TRUTH VALUE. (By the way, Nicolescu is a physicist, and I am not.)

That's why we are incompatible and not able to find a common denominator...

You are doing more physics, I'm doing more logic.

FILOKRATOS

Note that we almost agree where I talked about maximum indeterminacy where there is no dynamics, exactly where as you say there is no A and B to move or "oscillate"! You say it's constant, and I say constant and maximum, since there is no dynamics to change it!

Frankly, I think the ontological status of indeterminacy is such that it cannot be "mixed" with the energetic aspects of phenomena.

FLORENTIN SMARANDACHE

Isn't it possible to consider a phenomenon as partially actualized, partially potentialized, and partially indeterminate (neutral, unknown, undecided)?

FILOKRATOS

Whatever it is, and it is something, it must apply primarily to abstract entities, which "True" and "False" also are. A vague idea is simply one which has been actualized to a low degree.

FLORENTIN SMARANDACHE

Okay, I see the confusion between us. A "vague idea" is in neutrosophic one which has a low truth value but a high indeterminacy.

Therefore we are okay, don't we?

FILOKRATOS

Potentialization is not the result of a form of negation, but of an opposing energy.

FLORENTIN SMARANDACHE

I don't understand the difference, please advise...

Where does that opposing energy come from? Is it any scientific (physics) explanation?

FILOKRATOS

There may in fact, as you say, be different types of "contradictions" (can you list some?)

FLORENTIN SMARANDACHE

Various degrees of contradictions, between 0 and 1. Some more dynamic, others less. Concretes, or abstracts. Etc.

FILOKRATOS

... but there is only one form of counter-action which is what Lupasco's opposition should really be called.

FLORENTIN SMARANDACHE

I feel there are many counter-actions and reactions to the contradictions, depending on their nature and impact.

It is almost impossible to have everybody and anything counter-react in the same way...

FILOKRATOS

As for the LSB Principle, let's put it on hold pending further discussion.

FLORENTIN SMARANDACHE

No, let's do it now, you opened mon appetit...

Before going further, I want to let you know that I posted some ideas about Lupasco and Nicolescu in a Romanian e-group of literature, as an answer to somebody who disliked Nicolescu poetical theorems. I defended these both great Romanians, especially Lupasco's dynamics of oppositions, but the new

generation rejected playing/understanding contradictions. New generations are more arrogant...

FILOKRATOS

Rewind: ...except perhaps where you say that there are some pairs of opposites for which there is no included middle. I had already pointed this out, and gave some examples. Another example is the opposition between us.

FLORENTIN SMARANDACHE

Right. Then, how do you pass this through Lupascu's dynamics of oppositions?

The only principle the neutrosophic logic has is that it does not accept any principle!

FILOKRATOS

I do not accept this. This is equivalent to the ironist error, which raises the relative to an absolute.

FLORENTIN SMARANDACHE

Don't take it mot-à-mot.

It is said metaphorically, ironically – yes, in the sense that in neutrosophy any principle from classical COULD BE entangles if this results from reality.

I repeat: These actualization and potentialization from Lupasco look like the excitation and inhibition in Ancient Chinese yin-yang philosophy.   Yang directs change and yin implements it.

FILOKRATOS

There is no indeterminacy here.

FLORENTIN SMARANDACHE

Maybe I was not clear: in neutrosophy there is place for indeterminacy, I, which is included in the non-standard interval]-0, 1+[, but indeterminacy may be null. It is allowed in neutrosophy to have no (=null) indeterminacy.

Not always a new idea is formed by resolution of previous contradictions. For example, many times in science researchers do generalizations (i.e. extensions) of old ideas.

Therefore, they go on the same sense, and do not contradict it.

There is no contradiction here.

FILOKRATOS

You take contradiction in too limited a fashion. The contradiction here is between "going on" and "not going on".

FLORENTIN SMARANDACHE

Then, if you enlarge everything to contradiction...

Here I understand, this could be somehow regarded as a contradiction.

But another challenge: what about a completely new idea (not related with others) that arises, what contradiction is there? [I feel that you see contradictions in everything!] I see (A) as changing (moving) towards (P), and similarly (P) moving (changing) towards (A). Therefore, they become (A2) and (P2) respectively, then (A3) and (P3)...

These are their conversions (approaches) little by little towards each other.

FILOKRATOS

This is your theory; it has nothing to do with Lupasco.

FLORENTIN SMARANDACHE

I told you, we have different angles of looking at things, that's why we see uncommonly to each other. As in neutrosophy, paraconsistency, dialetheism, it is possible that both of us are correct (or both wrong) even having opposite ideas. We take different referential systems of studying things, as different mirrors, that why we get different results.

You are doing more physics, I'm doing more logic.

FILOKRATOS

The whole debate is about what logic is; since I have postulated a different view of logic, which includes compatibility with physics.

I therefore, a priori, will not fully agree with what you say logic is or is not.

FLORENTIN SMARANDACHE

I don't remember giving a definition of logic, logic is sometimes confused with the theory of proof.

Here you could be more specific.

Isn't it possible to consider a phenomenon as partially actualized, partially potentialized, and partially indeterminate (neutral, unknown, undecided)?

FILOKRATOS

Unknown, undecided perhaps, but as I said, this is epistemology, not a description of real, physical phenomena, including mental objects from the point of view of their production. If you are talking about meaning and propositions, your approach may be valid in part. But I suspect that the dynamics of changing beliefs look like Lupasco's.

FLORENTIN SMARANDACHE

The definition of neutrosophy is more connected to epistemology. I explained that Lupascu's resolution of contradictions, resulting in T-state, may not work all the time.

FILOKRATOS

No, I don't think so, and the example is useful to show why. I see no reason why a weakly actualized idea should not be true. It is weakly actualized because something opposing it (contrary ideas, thoughts, desires) is preventing it from being more actualized.

When everybody understands by "vague idea" something which is not clear, not well known, ambiguous, etc. (less truth, much unknown, less falsehood), whereas you understand "weakly actualized" – from a dynamic point of view maybe – we don't speak the same language.

Sure, could be your way too, as you said: because opposite ideas are more potentialized.

But also, a "vague idea" and its "opposite idea" could be both in the same time "weakly actualized". Why? Because they could be both "vague ideas", i.e. unknown (indeterminant).

For example: the opposite ideas <A>= "There is life in universe, besides us" and <Anti-A>= "There is not life in the universe, besides us" are both unknown, both vague simultaneously, both have the percentage of truth very small, and the percentage of unknown (=indeterminacy) very big [epistemologically, of course]. Due to the fact that there is no way to prove or disprove it now (it will be in the future, perhaps), both <A> and <Anti-A> are weakly actualized and weakly potentialized respectively.

You know something: it is almost impossible to comprise in a formula or principle all the reality!

I mean, each theory has singular points (points that have odd behaviors within the theory).

This is for Lupascu's and could be for neutrosophy [as Jean Dezert remarked when somebody tries to include everything in a theory].

The whole Lupasco system starts with the oppositional characteristics of energy (action) – Newton's First Law – at both physical, biological and mental levels of reality.

Think of the pair anti-body/antigen: again, no indeterminism.

FLORENTIN SMARANDACHE

I am afraid Newton's laws don't apply to quantum theory any longer – I have to check it. But, many classical physics principles are entangled in quantum phenomena and at superluminal speeds.

Various degrees of contradictions, between 0 and 1. Some more dynamic, others less. Concretes, or abstracts. Etc.

I feel there are many counter-actions and reactions to the contradictions, depending on their nature and impact. It is almost impossible to have everybody and anything counter-react in the same way...

FILOKRATOS

I do not understand these two points. The laws which govern different types (not only degrees) of counter-action are not identical, but they are isomorphous.

FLORENTIN SMARANDACHE

Is it any proof to this?

See how I reacted to your ideas, but someone else could react quite different! How do you prove they are isomorphous?

FILOKRATOS

The antagonism between our ideas is a reflection (quite pale, of course) of the antagonism in the universe. What Lupasco has done is to explain why there is,

and we can talk about, a yin, a yang and their union (two terms and an included middle) at all!

I can give no energetic meaning to the phrase "indeterminacy increases" (what makes it increase or decrease?, and so on.

FLORENTIN SMARANDACHE

Why do you always want to connect everything with energy?

FILOKRATOS

In his NOUS, LA PARTICULE ET LE MONDE, Nicolescu defines:

- a Lupascian logical included middle, which applies to energetic phenomena, including quantum mechanics (superposition); this is used specifically in the case of the wave/particle situation;

- an ontological included middle which implies the simultaneous consideration of several levels of reality, including that of consciousness;

- a "secretly" included middle, which poetically and philosophically, "est le gardien de notre mystere irreductible, seul fondement possible de la tolerance et de la dignité humaine."

FLORENTIN SMARANDACHE

What about a technics/science included middle too (at the same level)? This is what Jean Dezert and me would be very interested in.

FILOKRATOS

The properties of the "ontological" included middle have not been explored.

Not in detail. But since starting to talk with you, I am beginning to think that Indeterminacy is such an included middle.

FLORENTIN SMARANDACHE

Could be. Again, it depends on the angle of view.

FILOKRATOS

For discussion, one could say that it operates at an epistemological level of reality, one to which DSmT seems to me to be particularly applicable.

FLORENTIN SMARANDACHE

Yes, we (me and Jean) are more interested at this stage on epistemological level of reality, because this gives an application of our work. Jean is an engineer, more practical, and this is very good because he awakes me to the reality.

FILOKRATOS

What might such an included middle be, then, in the Zadeh example? I would say that it is the "new" opinion resulting or emerging from the application (demarche) of the "laws" of DSmT applicable at this level. The concept of Lupascian dynamic opposition still applies, since exactly as you say, there IS a conflict between the two doctors' views, and one can say that the actualization of one potentializes (during the judgement process) the opposing one.

FLORENTIN SMARANDACHE

I would say that the DSmT is a technical solution (and I like the word "technical", which is due to Jean, and I thank him again for redirecting me towards practice/application rather than pure theory where I was very close to slide...), hence the DSmT, especially DSm Rule, is a technical solution in resolving contradictory problems, I mean a technical way to finding the included middle.

Neither Lupascu nor Nicolescu provided a concrete, specific way (a rule, a formula, a precise method) of finding the included middle.

FILOKRATOS

These laws are different from those operating at the biological mental level.

I call that the "production" of the belief or judgement, which follow the Lupascian dynamic opposition but without Indeterminacy. What do you think?

FLORENTIN SMARANDACHE

There are various rules.

Using different rules (and there are, besides DST and DSmT, others) one obtains different included middles (= results) - I tried to use Lupasco-Nicolescu-Brenner's metalanguage which calls the result of combination of the opposites "included middle".

This is one more proof about the non-unicity of the included middle.

FILOKRATOS

I don't think it is fair to say that the (correct) decision taken would be to make additional tests for M and C only. Even if an (incorrect) decision of a tumor hypothesis were made by DST, tests would still be required and made but would then prove negative. The "risk" is the cost of such unnecessary tests, not an operation per se. Further, to be completely coherent, the proposition M + C is not 100% paradoxical. One CAN suffer from both a meningitis and a contusion at the same time, one masking the other, or even masking a tumor.

FLORENTIN SMARANDACHE

Right, the diagnostics could be only partially paradoxist/opposite.

This might constitute a future research. Me and Jean took in calculation the case when the elements of the frame of discernment are not independent; should we check what happens when one element is even included in another?

FILOKRATOS

Finally, one area I feel it would fruitful to explore further, from a Lupascian standpoint, is that of the relation between credibility and plausibilty, as well as that of compatibility.

FLORENTIN SMARANDACHE

This is similar to the confidence interval in statistics, yet different.

FILOKRATOS

THE NEW PRINCIPLE POSTULATES THAT INDETERMINACY IS INVERSELY PROPORTIONAL TO DYNAMICS! This means that where there is no dynamics, just an ideal or abstract yes-no, your Indeterminacy is maximum. There is no

basis for deciding where one is in the "oscillation" between the two independent terms. Where the dynamics is essentially complete, as in a quantum particle or a real human conflict, Indeterminacy is essentially nil. Recall that the Heisenberg Principle is one of (epistemological) uncertainty, but nothing is undetermined. Thus, Indeterminacy = 1 - Interaction.

FLORENTIN SMARANDACHE

Reviewing this principle, formulated by Joseph Brenner, from another point of view, I have to agree. I am waiting for concrete examples in various fields, for a better analysis.

I feel that this LSB would work in most of them, but not in all.

FILOKRATOS

COROLLARY. The less the dynamics, the lower the absolute probability of the emergence of a T-state, simply because the "degree" of overall oppositional energy is low.

FLORENTIN SMARANDACHE

This is right for a vague idea we talked already, with the example < L >= "There is life in the universe, besides us". The opposite idea < Anti-L > = "There is not life in the universe, besides us", which is also vague, therefore high indeterminacy, and low dynamicity, low inter-reaction between opposites, therefore low probability of emergence of the T-state.

FILOKRATOS

Lupasco's dynamics apply to complex phenomena and situations.

There are no interactions leading to an included middle T-state in the swings of a pendulum.

FLORENTIN SMARANDACHE

Two more questions:

1) Suppose 5 candidates run for an election (for example it happens in US to have more candidates from the same party who compete for representing their party).

This looks to be a multi-contradiction. How do you explain this election in Lupasco's system? Who is actualized and who is potentialized? What is the T-state in this case?

2) Two soccer teams start a game. This contradiction will be solved as such: either team T1 wining, or team T2 winning, or having a tied game (indeterminacy). What I mean is that the T-state could be T1 or T2, not necessarily 1/2 (in the middle, which occurs only when the game is tied). Comments? Next time, when they play again, the score might be tied, etc. Therefore the T-state is oscillating (not fixed) in solving a contradiction.

FILOKRATOS

My quick answer is that T-states are NOT involved in ALL aspects of the above examples, and that it is very useful to see where and where not. Nicolescu's answer to the first case would be that from a logical point of view, the oppositions

and contradictions involved can be reduced to pair-wise interactions between candidates, or between one candidate and the others as a group.

FLORENTIN SMARANDACHE

Therefore, not all contradictions involve a T-state (resolution), do they?

Other epistemological questions:

1) The proposition "1+1=2 in base ten" is 100% true, and its opposite "1+1 is not equal 2 in base ten" is 100% false. There is no indeterminacy, but no dynamics here as well. Thus LSmB seems not to work. Any Lupasco explanations?

2) Temporal propositions (which depend on the time; the location is fixed): "It is raining in Gallup" is a proposition which is false on a day like March 9th 2003, but the same proposition can be true at another day. Similarly, for the opposite "It is not raining in Gallup".

3) Geographic propositions (considering the parameter time as fixed): "It is raining" can be true in Paris, but false in Geneve for the same day.

4) Subjectivity: "I like beans" is true for me, but could be false for someone else who doesn't like bean.

How do you explain these examples using Lupasco's system? But LSmB principle?

5) Conjecture (= unsolved proposition/idea): Here both (LSmB and T-state) work.

If studies are done on a conjecture, dynamics increase, indeterminacy decreases; when the conjecture is solved/proved (either to be true or false), the included middle is found, therefore the indeterminacy is nil.

Consequence of LSmB: More energy involved in an idea involves less indeterminacy about that idea.

Because energy is somehow equivalent to dynamics.

Attempt to prove in a general way the LSmB Principle: More dynamics related to a proposition <A> mean more studies and understanding of this proposition epistemologically, therefore less indeterminacy on it.

I feel that the LSmB principle works for propositions that have some indeterminacy [I think this is the condition of existence of this principle]. Because if a proposition has no indeterminacy (as example 1, or like any true proved scientific proposition), neither its opposite has an indeterminacy, and it is no dynamics because the proposition has been proved true – nobody tries to contradict it anymore.

6) However, there are propositions proved true, for example the Fifth Postulate of Euclid (through a point exterior to a line there is one and only ONE line passing through this point and parallel to it), understood and agreed by everybody in the world. But, changing the reference system, this proposition became false [see the Lobacevsky Geometry (hyperbolic geometry: infinitely many parallels), or Riemann Geometry (elliptic geometry: no parallel)], or partially true and partially false simultaneously [see the Smarandache Geometries: mixture of the

previous three geometries; see my book at: http://www.gallup.unm.edu/~smarandache/ Iseri-book.pdf].

How to treat this case in Lupasco's system?

Maybe you would say that there are contradictions between the referential systems (for these geometries there are at least four such such systems).

Would Nicolescu consider them as different levels of reality?

Would these levels of reality mean something similar with Leibniz's notion of "world"? Leibniz said that a proposition is absolutely true if it is true in all possible worlds.

Let's reformulate the LSmB Principle: If a proposition/idea/entity has epistemologically a non-null indeterminacy either within the same reference system or within different referent systems, then dynamics and indeterminacy vary inversely proportional.

The problem is that we are not able to easily identify a non-null indeterminacy occurring at different referential systems – as happened to the Fifth Postulate of Euclid. What to do here, FILOKRATOS? In most of the cases we are able to identify the indeterminacy within the same referential system, n'est-ce pas?

FILOKRATOS

This can be seen better by using the second example to make a key point. I believe there is a fundamental difference between winning and losing as a dynamic process and win or loss (or tie) as a result. In the dynamic process of the game, sometimes one team is stronger than the other (winning), and sometimes the other, even if little. The result is a non-complex, Aristotelian limit that literally has no further dynamics. It is most definitely NOT a T-state. Don't we all enjoy a good match or game regardless of who wins?

For me, the T-state is the "good match", in which higher-level human qualities of fairness and grace emerge as well as strength and skill, etc.

FLORENTIN SMARANDACHE

In most of the professional games people are interested in scores, and less in performance.

FILOKRATOS

Perhaps this leads back to the idea that WHEN indeterminacy is null, one has states of maximum contradiction (Yin and Yang) from which an included middle (the Tao) emerges at a higher level of reality.

FLORENTIN SMARANDACHE

We can explain this considering again two teams playing.

If the contradiction is big, i.e. one team is much stronger than the other, then it has a good chance to win, thus indeterminacy (tied game is small).

Yet, there are surprises that occur in the sport (a weak team could get a tied score versus a stronger opposant team!) – how to explain this?

Reciprocally, when indeterminacy is high, i.e. we don't know much about the teams, every score could be possible!

How to explain this too?

FILOKRATOS

But the principle of levels of reality is required to see the "how".

Dynamic opposition is, according to this approach, necessary and sufficient at all levels, but at the epistemological level, a new law, which defines that level and introduces the – again dynamic – principle of indeterminacy is also required.

FLORENTIN SMARANDACHE

The principle might not work at the epistemological level!

FILOKRATOS

I see one way to resolve this contradiction in Lupasco. Actualizations, potentializations and T-states are not simple A1, A2, A3, but are themselves actualized, potentialized or in T-states giving rise to a nonary, nine-fold structure

of reality. One could say that a certain potentialized actualization is moving toward a certain "P" which is a potentialized potentialization of its opposite as well as its own actualization. I think one can use (part of) catastrophe theory to describe such trajectories.

FLORENTIN SMARANDACHE

I called them as in a sequence, A1, A2, A3, ... (and so on, not only three phases of transformations), but to you they may be emergences of actualizations and potentializations (I mean in various degrees/percentages).

FILOKRATOS

"Resolution!": Nicolescu helps here with the principle of levels of reality.

At the "physical" levels including quantum and psychic from the point of view of brain function, the "energetic" or logical included middle operates without indeterminacy.

At another level, which I tentatively call the epistemological level, indeterminacy may enter in addition to the still operative logical (energetic) aspects of dynamic opposition and included middles. But opposition and indeterminacy are reciprocal. This handles the vague ideas of your very good example.

The included middle is here what Nicolescu calls the ontological included middle. Indeterminacy is an ontological included middle property between limits of total determinacy and chaos which applies to phenomena at the epistemological level. Comment?

FLORENTIN SMARANDACHE

I agree. It is like a spiral, this evolution, and the resolution of ones could be at a higher level. Indeterminacy is between determinacy and chaos, right.

FILOKRATOS

There are three categories of phenomena:

1) where neither dynamic opposition nor indeterminacy apply;

2) where indeterminacy applies, but dynamic opposition does not;

3) where both dynamic opposition and indeterminacy apply.

FLORENTIN SMARANDACHE

Can there be a category where indeterminacy doesn't apply, but dynamics apply? Is it possible to have dynamics without indeterminacy?!

FILOKRATOS

Regarding 1): it includes pure mathematical and other abstract , ideal entities.

Opposites do not interact. This is your case 1). One might call this the domain of tautology.

FLORENTIN SMARANDACHE

Not only in math, but in any field (especially science) for those ideas that have been proved true.

FILOKRATOS

As for 2), it includes propositions which are still abstractions, but which involve some indeterminacy.

This is the primary domain of DSmT.

FLORENTIN SMARANDACHE

DSmT also applies to 3), where is indeterminacy.

One can use the DSmT to 1) as well if one combines two or more known results. DSmT is also an epistemological tool to measure the truth value of an idea resulted from combining more known results.

FILOKRATOS

I don't think it applies here, since Lupasco is primarily concerned with the real world and its dynamics.

FLORENTIN SMARANDACHE

Why not to extend Lupasco's system to the non-real world too (whenever it works)?

FILOKRATOS

Here is all right for your example 6). There are no real contradictions between referential systems, just different levels of complexity WITHIN a level of reality.

FLORENTIN SMARANDACHE

Here I said: contradiction between a proposition <P> (of parallels, as in my example 6) in a referential system (Euclidean referential system), and the same proposition <P>, which actually becomes <P'> (the reflection of the first one), in another referential system (say, for example, in Lobacevsky referential system). There is a contradiction, because they (<P> and <P'>) become opposite.

FILOKRATOS

Regarding 3), it includes BOTH the epistemological level of reality where there is SOME dynamics, as your example 5), and, of course, all other phenomena.

Indeterminacy, like other real operators, is also subject to actualization and potentialization.

In the real world, nothing is 100% determinate or chaotic.

FLORENTIN SMARANDACHE

Indeterminacy is not an operator, but a component.

This is questionable because of tautologies, which may be 100% determinate.

FILOKRATOS

Referential systems are epistemological devices, not ontological necessities, I think.

FLORENTIN SMARANDACHE

Right.

FILOKRATOS

So I would prefer, if the above looks right to you, to use it and for the real world.

FLORENTIN SMARANDACHE

It should be used wherever it can be used, I think 3) would be appropriate, yes.

FILOKRATOS

In any event, it is clear (as I have said before), that not all contradictions involve a T-state emerging.

FLORENTIN SMARANDACHE

Agreed.

FILOKRATOS

There are real Priestian dialetheias – most if not all paradoxes and "physical" contradictions like that between past and future where the "nexus", the ficticious present for example, has no real existence. In paradoxes, one oscillates from one interpretation to the other.

FLORENTIN SMARANDACHE

Yes, there is no T-state for paradoxes, but one can represent a paradox (epistemologically, of course) in the neutrosophic logic: NL(paradox)= (1,I,1).

FILOKRATOS

There is nothing like a point of maximum energetic contradiction, where in the American idiom, "push comes to shove".

FLORENTIN SMARANDACHE

DSmT, especially DSm Rule, is a technical solution in resolving contradictory problems, I mean a technical way to finding the included middle; neither Lupasco nor Nicolescu provided a concrete, specific way (a rule, a formula, a precise method) of finding the included middle.

FILOKRATOS

I don't quite agree with this. The idea that there must be a precise method for finding the included middle is much too classical. Lupasco talks about dialectomethodology – looking for the dialectics in a process –, and this is the closest one can come to a "formula". Also, the fact that we have now said that

DSmT operates at an epistemological level of reality suggests it is not valid in certain dynamical systems.

FLORENTIN SMARANDACHE

Give me an example where you think the DSmT is not valid, because I think epistemologically any phenomenon can be studied, therefore DSmT should work anywhere.

FILOKRATOS

To repeat, the proposed existence of an included middle is not developed arbitrarily, but from an analysis of the energetic aspects of phenomena.

FLORENTIN SMARANDACHE

This is one more proof about the non-unicity of the included middle.

FILOKRATOS

The non-unicity of the included middle is not a weakness of the Lupasco-Nicolescu system. I don't think you meant it this way, but the included middles that have

been identified in this system differ in pretty fundamental ways. Any additional one, such as, perhaps what I call the epistemological included middle, should be justified.

FLORENTIN SMARANDACHE

That's why I pledge for a generalization of the Lupasco-Nicolescu's system of included middle to the Law of Included Multiple-Middle, which is very well described by the n-valued refined neutrosophic logic: the indeterminacy-value (I) of a proposition can be split into multiple types of indeterminacies such as I_1, I_2, and so on. The indeterminacy [or neutral] value is actually an extension of the included-middle value; indeterminacy comprises the included-middle.

Even more, we can split the truth-value (T) of a proposition into multiple types of truths such as T_1, T_2, etc hand similarly we can split the falsehood-value of this proposition into multiple types of falsehoods such as F_1, F_2, etc. depending on each proposition.

We recall that in neutrosophy <A> is an entity (i.e. idea, notion, theory, etc.), while <antiA> is the opposite of <A>, and <neutA> is neither <A> nor <antiA>, but the neutralities in between them. And <nonA> means what is not <A>, i.e. <antiA> together with <neutA>.

Therefore, one has Aristotle's Third Axiom of Excluded Middle (in neutrosophic terms: either <A> or <antiA>), Lupasco-Nicolescu's Law of Included Middle (in neutrosophic terms: <A> and <nonA>, and a third value <T> which resolves their contradiction at another level of reality), and our Law of Included Multiple-Middle (in neutrosophic terms: <A>, <antiA>, and <neutA>, where <neutA> is a multitude of neutralities between <A> and <antiA>, for example <$neut_1A$>, <$neut_2A$>, ..., <$neut_nA$>).

Further, we extend the Principle of Dynamic Opposition [opposition between <A> and <antiA>] to the Principle of Dynamic Neutrosophic Opposition [which means

oppositions among <A>, <antiA>, and <neutA>]. It is similar to the extension from dialectics (Fichte, Hegel, Marx, Engels, Lenin) to neutrosophy.

In terms of neutrosophic logic, we substitute: true for <A>, false for <antiA>, and indeterminacy (or neutral) for <neutA>. Indeterminacy may be: neither true nor false, or true and false, or uncertainty, unknown, imprecise, ambiguity, etc.

The Logic of Dynamic Neutrosophic Opposition better characterizes Nicolescu's transdisciplinarity.

In Conclusion:

I pledge for the generalization of the Lupasco-Nicolescu's *Law of Included Middle* [<A>, <nonA>, and a third value <T> which resolves their contradiction at another level of reality] to the **Law of Included Multiple-Middle** [<A>, <antiA>, and <neutA>, where <neutA> (which is the whole neutrality or indeterminacy with respect to <A>) is split into a multitude of neutralities between <A> and

<antiA>, such as <neut$_1$A>, <neut$_2$A>, etc.]. The <neutA> value (i.e. neutrality or indeterminacy related to <A>) actually comprises the included middle value.

Further, similarly to the extension from *dialectics* to **neutrosophy**, I try to extend the *Principle of Dynamic Opposition* [opposition between <A> and <antiA>] to the **Principle of Dynamic Neutrosophic Opposition** [which means oppositions among <A>, <antiA>, and <neutA>].

Several References

1. F. Smarandache, Neutrosophy. / Neutrosophic Probability, Set, and Logic, American Research Press, Rehoboth, USA, 105 p., 1998; - Republished in 2000, 2003, 2005, A Unifying Field in Logics: Neutrosophic Logic. Neutrosophy, Neutrosophic Set, Neutrosophic Probability and Statistics (second, third, and respectively fourth edition), American Research Press, 156 p.; - Chinese translation by F. Liu, A Unifying Field in Logics: Neutrosophic Logic. /

Neutrosophy, Neutrosophic Set, Neutrosophic Probability and Statistics, Xiquan Chinese Branch, 121 p., 2003; - Russian partial translation by D. Rabounski: Hexis, Сущность нейтрософии, 32 p., 2006.

2. H. Wang, F. Smarandache, Y.-Q. Zhang, R. Sunderraman, Interval Neutrosophic Sets and Logic: Theory and Applications in Computing, Hexis, 87 p., 2005.

3. Florentin Smarandache, Feng Liu, Neutrosophic Dialogues, Xiquan, Phoenix, 97 p., 2004.

4. F. Smarandache, Ştefan Vlăduţescu, Neutrosophic Emergencies and Incidencies, Verlag LAP LAMBERT, OmniScriptum, GmbH & Co. KG, Saarbrücken, Deutschland / Germany, 248 p., 2013.

5. Joseph Brenner, Transdisciplinarity / Presentation at the Workshop <Though as Design> at **experimentaldesign01**, Arrabida, Portugal, October 17, 2001.

6. Joseph Brenner, Naturalizing Lupasco: Paraconsistent, Transconsistenr and Quantum Logic, draft, Les Diablerets, Switzerland, July 2002.

In this book the author pledges for the generalization of the Lupasco-Nicolescu's *Law of Included Middle* [<A>, <nonA>, and a third value <T> which resolves their contradiction at another level of reality] to the *Law of Included Multiple-Middle* [<A>, <antiA>, and <neutA>, where <neutA> is split into a multitude of neutralities between <A> and <antiA>, such as <neut$_1$A>, <neut$_2$A>, etc.]. The <neutA> value (i.e. neutrality or indeterminacy related to <A>) actually comprises the included middle value.

Further, similarly to the extension from *dialectics* to *neutrosophy*, the author extends the *Principle of Dynamic Opposition* [opposition between <A> and <antiA>] to the *Principle of Dynamic Neutrosophic Opposition* [which means oppositions among <A>, <antiA>, and <neutA>].