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RELATIVISTIC DIALECTIC

Polarity Continuum/Discreteness

Few terms are more confused than "dialectic" and we shall not embark on comparative study of historic partial or total dialectic failures, to mention the tutorial Socratic, the speculative Medieval, the fatuous Hegelian, the deadly Marx-Engelsian and the ill-founded Sartrian.

We shall mean by "dialectic" the Relativistic Dialectic (RD) defined as reasoning based on Einstein's Physical Reality ("NATURAL MODEL") and in particular on the Continuum/Discreteness (CD) Polarity and on the foundational preponderance of its continuous aspect.

We have defined the CD polarity as the basic structure of all human experiences ("TIME, AWARENESS AND EVENTS"). Inference pertaining to RD is embodied in the ERN Logic ("ERN LOGIC").

Apparently contradictory aspects determine conjointly the polarity intuited as a physical phenomenon or as a human situation.

Thus, apparently contradictory aspects, the discrete photon and the continuous wave determine conjointly the phenomenon "light". We shall consider them as "phenomenally equivalent".

Thus, apparent contradictions "friend" and "enemy", attributed to the same entity and considered dialectically determine conjointly a situation. We shall call them "dialectically complementary".

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On the contrary, taken as absolute "logical" contradictions, they misrepresent the situation as may be illustrated with the following historic example.

Traditional naive pseudo-logic uses sort of +/-1 arithmetic. Friend of my friend is my friend ($1*1=1$). Enemy of my enemy is my friend ($-1*-1=1$).

Thus USSR, the enemy of my Nazi enemy was necessarily my friend.

Enemy of my friend is my enemy ($-1*1=-1$). Thus Finland, fighting against USSR was necessarily my enemy.

And, logically, France and Britain committed one of the most shameful acts in their history - declared war on a tiny Finland defending her existence against the monstrous Soviet giant.

But ERN dialectic would show Finland as both friend AND enemy with the respective plausibilities about 95% and 5%.

On condition of remembering that the WWII has been fought in defense of freedom, against totalitarian enslavement and setting accordingly the axioms.

Besides reality conform deductive/inductive interplay and fuzzy algorithms, the principal merit of ERN consists in boosting pertinent axiomatics.

One may object that "friend" and "enemy" are both discrete apperceptions and that their contradiction lacks a continuous aspect. However, the network structure of ERN admits many-to-many relations among discrete and continuous aspects.

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"Friend" and "enemy" are indeed eventual and discrete, but they have their continuous counterpart(s) in intuitive belief(s) of (one's) awareness embodied in the axiom(s).

Similarly, the positive and negative poles of the magnetic polarity are discrete, eventual aspects of the intuitive continuous magnetic field.

FOUNDATIONS OF PHYSICS

RD being derived from Einstein's Physical Reality, and its basic CD polarity with continuum preponderance, one expects it to be supported and verified by concurrent physics. It amounts to presume falsification and failure of discreteness based models.

And, indeed, two principal failures of recent physics concern two famous discreteness based models, the Aether and the (rudimental) Quantum Mechanics. We discuss them respectively in "SECOND SCIENTIFIC REVOLUTION" and in "FOUNDATIONS OF QUANTUM PHYSICS".

One may set against them the vertiginous successes of continuum based models such as the extended relativity and the quantum field theory.

FOUNDATIONS OF MATHEMATICS

In "PREDICATE LOGIC" and "SET THEORY" we have seen that the obstination to found mathematics in discreteness led to hundreds inconclusive theories and that this proliferation leaves after 100 years the fundamental concepts of set and number totally undefined.

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We set against this ubiquitous failure Einstein's conviction that mathematics are founded in continuum, which we introduced in the "NATURAL MODEL" as follows:

mind's faculty of putting every body situated in any arbitrary manner into contact with the quasi rigid continuation of a chosen body of relation B_0 is the basis of our intuition of space. In pre-scientific thinking, the solid earth's crust plays the role of B_0 . The very name geometry indicates that the idea of space is mentally connected with the earth considered as the relation body.

We shall find the intuition of space founded by rigid bodies at the base of Einstein's Covering Principle which requires physical distance to be measured, also in mental experiments, with physical rods complying with physical rules, such as the Lorentz Contraction. The Covering Principle underlies directly or indirectly the entire Extended Relativity.

Continuous space, its primacy and the discrete covering measurement rods are aspects of the fundamental Polarity Continuum/Discreteness (CD) defined in "TIME, AWARENESS AND EVENTS" as the elementary structure of human Universe.

In mathematical terms geometry symbolizes the basic intuitive image of continuous space and arithmetic - its discrete covering measurements. The ultimate foundation of mathematics is the continuum. Discrete concepts starting with that of "number" are founded in continuum and symbolize its covering measurements. Shortly, arithmetic is founded in geometry.

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In "FOUNDATIONS OF MATHEMATICS" we extend the continuum foundations over the totality of mathematics and conclude:

We believe to have shown the equivalence of foundations of mathematics and physics in ontological continuum. In other terms, mathematics does not have, nor need particular foundations, different from the general foundations of rational symbolic constructs.

Another confirmation of our view may be found in the ultimate Frege's disappointment. In 1923 he came to the conclusion that the aim he had set himself throughout most of his career, namely to found arithmetic in (predicate) logic, was wrong. He decided instead (like ourselves) that one had to base the whole of mathematics on geometry.

He began to work on these ideas but had not progressed far by the time of his death.

To finish with a poetic note, if anybody, then Frege was worth of these lines:

If you can make one heap of all your winnings
And risk it on one turn of pitch-and-toss,
And lose, and start again at your beginnings
And never breathe a word about your loss

It's most gratifying to see his "start again" confirm our ideas.

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