A CLAIM FOR MINIMUM CONTRADICTIONS IN PHYSICS

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ABSTRACT

The purpose of this paper is to show that our common communication system through which the physical theories are stated leads into contradiction; this is verified by Goedel's theorems. A claim for minimum contradictions in Physics is stated and this is compatible to a Space-Time QM.

I. INTRODUCTION

According to the up to now gained experience the physics theories reveal various contradictions. According to the GRT a point mass creates a spacetime continuum the point mass being regarded as an anomaly[1]. The SRT is based on the hypothesis that there exists free motion of reference frames i.e motion out of any spacetime continuum a fact which contradicts the GRT[2]. According to the QM, the probability density P(r,t) implies that a particle can exist and not exist at the same point and at the same time [3]. According to the classical mechanics we cannot have adequate explanations for gravitation or for the quantumization of various physical magnitudes [4]. Therefore the question is raised whether these theories are contradictory or the communication system through which these theories are stated, is contradictory itself. A purpose of this paper is to show that the communication system mentioned comprises of the Aristotle Logic and of a hidden axiom which postulates the existence of earlier and posterior and that this system is contradictory. However through a contradictory system nothing can be stated. Therefore when we communicate we use another hidden axiom according to which "what is accepted as truth is what includes the minimum possible contradictions" since the contradictions cannot be vanished [5]. This paper is based on a theorem related to our basic communication system and it is compatible to the hypothesis of the Quantum Space-Time-Aether [6]; through this theorem Goedel's theorems can derive without any further assumption.

II. THE CONTRADICTIONS OF LOGIC SYSTEMS
a. General
We suppose that there is a system comprising Aristotle logic denoted as Λ and an axiom A which is not theorem of logic Λ. We will show that the following theorem I is valid:

Theorem I : *"Any system of axioms which includes the Aristotle logic Λ and at least an axiom* A *which is not theorem of logic Λ leads into contradiction."*

Proof. Since Λ is valid it can be applied in the text which follows. By definition the following statement is non valid :

$\Lambda \supset A$

Therefore it is valid that :

$\Lambda \supset \sim A$ \hfill (1)

According to logic Λ we have:

$A \supset A$ \hfill (2)

Because of (1,2) we obtain:

$\Lambda \cdot A \supset (\sim A)\cdot(A)$ \hfill (3)

Therefore because of relation (3) any system which includes the logic Λ and an axiom which is not theorem of logic Λ leads into contradiction. This statement covers all systems of axioms which beyond Λ include further axioms since by definition any axiom cannot be proved (through Λ). However in such systems we have to investigate if the additional axioms fulfil the condition to be axioms i.e. that they cannot be proved through the logic Λ .

We consider the following axioms:

"0": "There exists the number 0" \hfill (4)

"1": "There exist the immediate next number of any number x" \hfill (5)

For any concrete object, denoted as C, the following correspondences can be valid:

"There exists the number 0" $\leftrightarrow$ "There does not exist the object C" \hfill (6)

"There exists the number 1" $\leftrightarrow$ "There exists the object C" \hfill (7)

According to the logic Λ if C does not exist it cannot be valid that C exists. Thus, because of (6,7) the existence of the number 0 cannot imply (through the logic Λ) the existence of the number 1. It is noted that the correspondences (6,7) show the way through which the numbers 0 and 1 can exist; the numbers 0 and 1 have not any meaning out of these correspondences. Therefore the axiom (5) is not a theorem of "$\Lambda \cdot 0$ " and therefore of Λ since it is not valid for x=0. This means that the axiom (5) fulfils the conditions to be an axiom and hence theorem I can apply. Denoting the axiom (5) as *earlier-posterior axiom*, and taking into account the above mentioned we can state the following statement I:

Statement I: "Any system of axioms which includes the aristotle logic Λ and the earlier-posterior axiom leads into contradiction."

Under the hypothesis that the system $\Lambda \cdot A$ is consistent the axiom A should be self proved; this implies that there is not contradiction in the system a fact which is in contrast with theorem I. This means that we cannot prove through this system that the axiom A can be self proved. Thus we can state the following statement II.

Statement II: "In any consistent system of axioms which includes the Aristotle logic Λ and at least an axiom A which is not theorem of logic Λ there are statements which cannot be proved though the system."

Under the hypothesis that the system $\Lambda \cdot A$ is consistent theorem I should not be valid and therefore this system cannot prove its consistency. Thus we can state the following statement III.

Statement III: *"Any consistent system of axioms which includes the Aristotle logic Λ and at least an axiom A which is not theorem of logic Λ cannot prove its consistency."*

In the case that "A" expresses the "earlier-posterior axiom", under the hypothesis mentioned, statements I and II express the 1st and the 2nd Goedel's theorems respectively[7] since the "earlier-posterior axiom" is implied when the natural numbers exist.

b. The Claim for Minimum Contradictions in Physics

Our basic communication system comprises of Aristotle logic and of a hidden axiom which postulates the existence of earlier and posterior. In fact, every word or phrase is constructed in such a way that the letters or the words are put the one after the other. Thus, the basic communication system obeys the statement I. However we notice that statement I cannot be stated because it is based on the basic communication system which, according to statement I, is contradictory. Thus, statement I imposes the silence. When we communicate, we use another hidden axiom according to which *"what is accepted as truth is what includes the minimum possible contradictions"* since the contradictions cannot be vanished . According to this hidden axiom, which we could name as *"axiom of the minimum contradiction"*[5], we obtain the logical and the illogical dimension that is needed, according to what was mentioned, in physics. In fact, through this axiom we try to approach logic (minimum possible contradictions) but at the same time we expect something illogical since the contradictions cannot be vanished. The systems of axioms we use in Physics include the communication system and therefore their contradictions are minimized when they are reduced to the communication system itself.

It is noted that a Space-Time Quantum Mechanics which is based on the hypothesis of the Quantum Space- Time(QST)- Aether can be regarded as a possible consequence of the "earlier – posterior axiom" and therefore of the communication system itself [8]. However the question is raised: since statement I is valid how can the "earlier – posterior axiom" apply? This can be answered through the "axiom of the minimum contradiction"; all axioms of the basic communication system constitute a reference frame through which we can describe reality; reality itself i.e. the real space-time is contradictory. These are compatible with the hypothesis of the Quantum Space- Time- Aether; this hypothesis can apply on the basis of a reference space-time which is a hypothetical Euclidean space-time in which the "earlier – posterior axiom" is valid; the Quantum Space- Time- Aether itself is stochastic [6]. Because of the stochastic nature of space i.e. because of its uncertanty a point "occupies" space-aether . Thus we may assume that there exists a kind of aether-point duality [2].

III. DISCUSSION

Taking into account the above mentioned we may notice the following:

1. We can reach   statement I through Goedel's work (not theorems)[7,8,9]; however we may notice the following: Goedels work is based on Principia Mathematica and Peano axioms which apart from the "earlier – posterior axiom" include other axioms as well. Thus, according to Goedel's work we cannot pretend that the contradiction of a system is due to the "earlier – posterior axiom"; therefore Goedel's work is not absolutely safe to be applied to the basic communication system. It is noted that theorem I and statement I are based only on our commonly known Aristotle Logic i.e. on the identification rules and not on the rules of Principia Mathematica [7].

2. The question is raised whether statement I or statement III (in the form of a Goedel theorem) can be applied in physics.

 Statement III is based on an arbitrary hypothesis (consistency of the system of axioms) and it can apply only to systems which are regarded as consistent (e.g. in pure mathematics). According to this statement there are not contradictions and the axiom validation is due to something out of our way of thinking. This way of thinking leads to the aspect that space-time is continuum.

According to statement I and to the axiom of the minimum contradiction our way of thinking can detect contradictions during our effort to understand Nature. This is compatible with the fact that the up to now stated theories include contradictions. This way of thinking leads to the aspect that space-time is stochastic.

REFERENCES

1. S.Hawking and R.Penrose,1996. The Nature of Space and Time. Princeton University Press.

2. C.K.Whitney,1999. A Revolution Too Far (From the Editor). Galilean Electrodynamics. Vol.10, No 5.

3. L.I.Shiff,1968. Quantum Mechanics. McGraw Hill, N.Y.

4. S. Trahanas,1991. Quantum Mechanics I. Publ. Univ. of Creta, Greece.

5. A.A.Nassikas,1995. The Claim of the Minimum Contradiction. Publ.Trohalia, p.220 (in Greek, ISBN 960-7022-64-5)

6. A.A.Nassikas, 1998. The Hypothesis of the Quantum Space Time - Aether.

a) Int. Conference "Fundamental Problems of Nature Sciences". St. Petersburg, Russia.

b) Accepted for publ. in Galilean Electrodynamics, Special Issues 2, 2000

7. E.Nagel and J.R.Newman.1958. Goedel's Proof. N.Y.University Press

8. A.A.Nassikas and P.F Parshin, 1999. The Hypothesis of the Quantum Space- Time-Aether and the Main Principles of Physics as Possible Consequences of a Unique Axiom. Int. Conference "Fundamental Problems of Nature Sciences". St. Petersburg, Russia.

9. Rosser Barkley. An informal exposition of proofs of Goedel's theorems and Church's theorem. Journal of Symbolic Logic, vol4, p.53-60, 1939

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