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DISSOLUTION OF THE
REALISM/ANTIREALISM PROBLEM

INTRODUCTION

This paper investigates the way to dissolve the adversary either/or position represented by realism and antirealism by suggesting the complementarity approach which was so successfully introduced by Niels Bohr in his revolutionary way of thinking applied to modern physics. Bohr himself hoped that one day the complementarity principle would become the backbone of everyone's education and would be applied in the entire spectrum of our society. However, Bohr's approach is regarded as revolutionary only in the western philosophico-scientific tradition. Outside of it there are similar philosophical, moral, and spiritual perspectives to be found in Taoism, Buddhism, Upanishads, and Jainism whose followers regard complementarity of Bohr as more-or-less commonplace.

The argument of this paper focuses on the priority of the question and the underlying assumptions which are responsible for polarity systems of answers in the form of the epistemological realism coupled with ontological materialism on one hand and epistemological antirealism and ontological idealism on the other hand. In this very adversary form it has become a major philosophical, scientific, and ideological argument of the western tradition. We seem to be at a crossroad; we can blindly continue to amass other either/or positions in our realism/antirealism conflict. If we decided to follow Niels Bohr's suggestion of complementarity we will discover that any two opposing contradictory aspects are always integral, inseparable parts of a whole. "One cannot bow in front of somebody without showing one's back to somebody else" [1].

Any consequent dissolution of the realism/antirealism problem can be successfully achieved by adopting a new conceptual context going radically beyond the Aristotelean tradition by exclusion of his *Tertium non datur* principle and replacing it by the principle of complementarity which can be symbolized as excluding $[p \vee q \equiv \sim(p \wedge q)]$ and replacing it by $[p \vee q \equiv (p \wedge q) \wedge r \wedge s \wedge \infty]$.

I

A great insight is a statement whose denial is another great insight.

Niels Bohr

Philosophical and scientific problems manifest their intrinsic interconnectedness all through the history by articulations of peculiar mind-sets driven by mankind's curiosity. Some of them became central to views about the mystery of the universe and man's role in it. Their implications found, in turn, their manifestations in religion, arts, science, politics and in due time penetrated the entire theory and praxis of mankind. All through history such a philosophical problem was and still is the problem of realism based on assumptions that there is a world outside of the perceiver, governed by laws, we can know and communicate to others. Two forms of the western realism are notably represented in teachings of Plato and his pupil Aristotle, and both of them are responsible for a great part of the philosophical, scientific and religious cultural context of the West. In Whitehead's comment that the entire history of the West consists of a few footnotes to Plato we have probably the best defined historical role of realism. As this type of realism in all its forms is essentially dualistic, it will find its contradictory nemesis in antirealism challenging the realistic position by advocating a view that the world and everything in it is nothing but a temporary useful fiction helping us to organize our observations for our benefit, however, predestined to be replaced by another useful fiction in the future. Both of these positions represent a conflict of mind-sets within which corresponding self-referential realities are being constructed.

Psychologically the realistic thesis provides an ultimate foundation for attainment of certainty by getting away from oneself and finding the anchor in the world of things in their totality. As one can see, the entire cultural, religious, political and social striving was, and, to a great degree, still is, carried on within the realistic tenets of mankind. On the other hand, the historical position of the antirealism starting with Xenophanes' anthropomorphism and method of projective hypostatization bases all human striving in the man himself as an observer who, driven by his curiosity, continues his search and re-search and never reaches the ultimate finding! The search with its temporary finding becomes the only uppermost reward. Following Xenophanes, the best of the philosophical and scientific tradition became necessarily anthropomorphic,

hypothetical, open-ended. It found its corresponding world-view in the concept of open universe, open-society, open-mind without ever being able to reach certainty by either logical, mathematical, scientific, philosophical, or mystical ways.

Not until the 20th Century was it possible to depart from the traditional dualistic categories dictating our thought pattern with implied adversary relationships. The entire fabric of our western culture became saturated with this dualistic categorization manifested in most of its science, philosophy, religion, arts, politics, and social striving. When it entered the global scene it assumed the role of messianism attempting to disseminate its western mission all over the world. Given the view that there exists an absolute truth and by conviction that it was in possession of certain selected groups we have had the greatest historical examples of intolerance represented by the institution of the Inquisition and the 20th Century National Socialist, Fascist, and Communist ideologies. Realism always appealed to large collectives, while antirealism, on the other hand, was the conviction of individuals working in isolation from the masses.

II

When the province of physical theory was extended to encompass microscopic phenomena, through the creation of quantum mechanics, the concept of consciousness came to the fore again: it was not possible to formulate the laws of quantum mechanics in a fully consistent way without reference to consciousness.

Eugene Wigner [2]

It was a universal belief of the scientists of the 19th Century that the 20th Century would bring the completion of the Newtonian world-view by providing all the missing details. Materialism became not only the integral part of scientific method but the very condition under which science could be conducted. There were only rare exceptions among scientists and mathematicians who did not subscribe to this dogma [3].

The predictive power of the mechanistic science celebrated successes which silenced even the most vocal critics. Immanuel Kant himself declared the findings in mathematics, logic, and physics, as completed in principle, to which nothing substantial could be added. This very

successful way of thinking in physical sciences inspired a speedy application to all other sciences such as biology, psychology, sociology, economics, anthropology, politics, and philosophy. The shift continued and persists practically up to now. Its political, social, and economical implications became responsible for much of the havoc of the 20th Century.

One of the most significant realistic and materialistic stands against the implications of the new advances in science at the end of the 19th Century and the beginning of the 20th Century is Vladimir I. Lenin's work *Materialism and Empirio-criticism*, regarded by his followers as an epoch making work of genius [4]. There were two major philosophical positions Lenin maintained in his desire to protect the dialectical materialism of his days. The first was the theory of knowledge of Marxism under attack from various streams of modern philosophy including the Social Democrats and the Russian Marxists – the second was the problem of the concept of matter which was under attack due to the implications of the discovery of radioactivity, which in turn released an avalanche of speculations suggesting “dematerialization of the atom” and “disappearance of matter”.

Lenin was the first one to recognize these new emerging developments as mortally endangering the very realistic and materialistic foundation of Marxism in both theory and praxis. Truly in Marx's way Lenin attacks, under the name of ‘physical idealism’, scientists and philosophers, such as Mach, Poincaré, Avenarius, Duhem, Pearson, his Russian adversaries Lopatin and Bogdanov and a host of others. Lenin's defense of materialism and realism with his epistemology of copy-theory laid down the 20th Century position of the Soviet School of Marxism (Leninism-Stalinism) against the idealistic interpretations of Einstein's theory of relativity with its equivalence of mass and energy and of quantum mechanics of the Copenhagen School.

On the basis of Lenin's restatement of the 19th Century realistic and materialistic dogma it was rather consequential to reject the philosophical concepts of complementarity and uncertainty-relations due to their denial of causality and objectivity of micro-phenomena. The Copenhagen ‘idealistic interpretations’ was thus rejected because it regarded the wave-function describing the state of the micro-particles not as an objective state of affairs, but merely as an expression of the knowledge of the observer where the wave is not the property of the objects of the microworld but merely a wave of probability.

As we can see it in retrospect, Lenin's crusade against the spirit of the modern way of thinking which was manifested in new scientific and philosophical approaches, helped to create a closed system of thinking, which in turn produced a closed society unable to compete with the rest of the world. Its recent abdication from the stage of modern history of mankind must be regarded as an overdue disappearance of dysfunctional philosophy in both theory and praxis.

III

Physics does not deal with physics. Physics deals with what we can say about physics. What we can say depends in turn on what we can agree about; and that depends on clicks of a counter, irreversible acts of amplification, indelible records.

John Archibald Wheeler [5]

The above quotation is from Professor Wheeler's ‘working paper’ series of three lectures delivered by the author in Beijing, Hefei, and Shanghai in October 1981. It was almost 50 years ago, when in 1932 Niels Bohr, Professor Wheeler's great teacher and mentor, returned from his visit to China, inspired by the great cultural tradition of its past. The principle of complementarity formulated by Bohr five years before his pilgrimage to China acquired thus a new symbol represented by the Chinese YIN-YANG accompanied by the Latin motto *non contraria sed complementa*, and the hope that one day this very principle would become the central core of our entire educational system in the West. Professor Wheeler, one of the last surviving giants of Bohr's school could not help but come and report to you the accomplishments which followed Bohr's legacy during the remainder of the 20th Century. In light of this new tradition we can observe a slow process of introducing complementarity as a way of thinking into all other aspects of our contemporary modes of thought. Similarly, we see the implications of Heisenberg's principle of uncertainty for the historical striving of mankind to escape from itself into some postulated certainty out there, and with it the nonetheless stupendous implications of Gödel's incompleteness theorem which proved the openendedness of human thought as against the axiomatic closed mind. In light of these innovative ways of thinking I dare to argue for the dissolution of the realism-antirealism problem as one of the important metaphysical underpinnings of the historical and

cultural tradition of the West which is entirely foreign to the traditional heritage of China and the great part of the Orient.

Professor Wheeler's 'Chinese' quotation provides a telling description of the new view of the nature of the reality of the universe as no more "sitting out there" independent of any act of observation. Rather, 'reality' is directly the co-production and by-product of the observer's intentional total tools, thus making observer's actions necessarily participatory actions. (*Esse est participare*.) There are many implications of this turn around, one of them is that we cannot have any information unless we have acquired it by some specific method accompanied by detailed disclosure of both – what we report and how we arrived at it. The observer is ourselves – thus we have to start and end with him (or her) – there seems to be no escape any more. Again there are necessary implications. The most important ones are that the traditional dualistic division of the subject and object, inner and outer world, body and soul, good and evil, true and false, right and wrong, paradise and hell are no longer adequate concepts for a more sophisticated description of our new 'realities'.

A long time before the impact of the above discussed ideas was felt in our century, there was an important discovery of the German physicist Johannes Müller (1801–1858) who formulated the idea that the world as we sense it is our own construction – known as 'Müller's law of specific nerve energies'. An important conclusion of this law is that our sentences do not mirror the external stimuli but only the state of the nerve being stimulated which provides us with the justification that our system of cognition is self-referential and self-explicative [6]. Müller's law thus anticipates very important epistemological consequences of the new way of thinking in the 20th Century, expressed through principles of complementarity and uncertainty relations and the incompleteness theorem.

CONCLUSION

This paper attempted to expose the cultural, philosophical, and scientific assumptions behind the historical conflict of realism and antirealism. They were responsible for a state of petrification into dualistic categories of adversary relationships of our traditional way of thinking applied to the entire interpretation of reality in both theory and praxis. It was the radical departure from this traditional way of thinking due to our new

scientific advances at the beginning of the 20th Century which forced us to rebuild our world-view during the 20th Century. It has been proved over and over again that deep-rooted prejudices of human thinking die hard as it was the case with false hypotheses about ether, phlogiston, or pure race, survival struggle, class struggle, Oedipus complex, geocentricity of the solar system, phrenology and so forth. The old world-view was a result of questions we asked and extralogical strivings for certainty – it helped us to collect facts we desired, and preferred interpretations we were pleased with. The old world-view was self-referential and self-explicative without being aware of it.

In view of the above insight many philosophical problems which resulted in adversary positions will disappear because a new world-view does not provide the soil in which they can flourish. Among these will be notably our realism/antirealism problem and hosts of others such as materialism and idealism, subjectivism and objectivism, mind-body problem, individual-collective and any other adversary application of categories of exclusion.

The transition from one to another world-view is the best testimony of humanity triumphing over its own prejudices and limits and reaching its higher level of self-improvement on its way *ad summum*.

$$(p \vee g) \equiv \sim(p \wedge g)$$

is rather

$$p \vee q \equiv p \wedge q \wedge r \wedge s \wedge \infty$$

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2. Wigner, Eugene (1967). *Symmetries and Reflections*, Indiana University Press, Bloomington, p. 189.
3. Isaac Newton himself hoped to explain with his mechanistic laws only "all corporeal things", still maintaining an existence of non-corporeal ones. Mathematicians and logicians due to their *a priori*istic approaches were outside of the realist-matter-alistic orbits.

4. Lenin, Vladimir I. (1952). *Materialism and Empiriocriticism, Critical comments on a Reactionary Philosophy*, 1909 (originally published), Moscow.
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6. Müller, Johannes (1834-1840). *Handbuch der Physiologie des Menschen*. "Sensation consists in the sensorium's receiving through the medium of the nerves, and as a result of the action of an external cause, a knowledge of certain qualities or conditions, not of external bodies, but of nerves themselves." Müller's quotation is in E. Boring (1950). *A History of Experimental Psychology*, 2nd ed., Appleton, New York, p. 82.