

Words on the attribution

Santilli-Galilei Prize

JR Croca

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It is a real pleasure for me to be here among those who look for the scientific truth without hesitations and compromises. Those, who seek for truth and rightness by its intrinsic value even if it brings prejudice for their careers and other personal interests.

In this sense I would like to thank the Santilli-Galilei Commission for the great honour of having singled me out for the Santilli-Galilei Gold Medal. A word of special thanks to Professor Myron Evans for his courageous example in the hard fight against the nowadays prevailing obscure scholastic way of doing science. I want also to thank Professor Francesco Fucilla for his most kind help in all this process.

A word of recognition to my students and to all members and collaborators of the Philosophy of Science Centre of the University of Lisbon, in particular to Professors: Olga Pombo, Rui Moreira, Amaro Rica da Silva and Gildo Magalhães. To my Master, Professor Andrade e Silva, student of the great French physicist Louis de Broglie, with whom I was initiated in the study of this fascinating field of the foundations of Quantum Physics. To my dear colleagues of the Cátedra A Razão of the University of Lisbon for the constant support they always gave me. To the Faculty of Sciences of the University of Lisbon and in particular to the Physics Department and to the Museum of Science of the University of Lisbon, and to all my colleagues that in a way or in another have helped me during my work. I could not let pass the opportunity of thanking the Naval School of the Portuguese Navy, where I have taught for about two decades, for the welcoming and motivating environment, where part of my work was really done.

Finally, a word of thanks to my family: to my daughter Miriam and Peter, to my son José Alexandre and Sofia for all the support they always gave me especially at the most difficult times and to my little grandson José, hope in a better world.

A special word of love and warm friendliness to my dear wife, Maria Adelaide, which unfortunately can not be present, to whom I dedicate this award, since she has always supported me in all the decisions I took in life, also for caring for my children when I was absent, for constantly sharing with me, with permanent dedication and enthusiasm the difficulties of the search for the Truth... even in this period of illness. To her, my most grateful thanks. This prize that was awarded to me is, actually, in large part, also hers too.

Today we are witnessing a growing spread of irrationalism and obscurantism, diffused either by the media or by other means more or less clear. The purpose behind this spreading is to lead people to avoid reasoning in a clear and consistent manner and, above all, to prevent them from thinking by themselves. For these reasons the fight for the Truth is, nowadays, of such importance that it can not be relegated to a mere passive secondary role. Each one, within their own sphere of action, has the obligation and the duty to assume his task.

In the scientific domain, specifically in the chapter on physics, the advent of the twentieth century brought with it, against everything we would expect, the ingredients that led to an extension, and even to pseudo justification for the ill founded magic reasoning, for the irrational, for the hidden secrets, revealed to the rare chosen ones. Science became filled with dogmatic attitudes, prerogative of the closed monolithic systems.

In fact in the field of relativity the picture is not very bright. A large majority of the scientific community claim that they can, based on standard relativity, prove "scientifically" that the universe had a beginning, with the so-called Big-Bang. They go even further, telling the history of the universe, with every detail since its creation. Everything happens, in a way quite similar to the biblical recitation since the creation to the present day. The only difference of the biblical genesis is that now they claim a pretentious scientific justification for the tale. The basic question is whether man can, at any stage of his development, supported by scientific evidence, claim that the World had a beginning and an end. Of course we can conjecture about this problem. But any elaboration, the more refined and precise that it may be, will always necessarily be limited to a given historic social context and, ultimately, to the development of the tools available at the time, both physical and conceptual. Thus, at best, any elaboration on issues such as the beginning or end of the world will be no more than mere conjectures that can never be scientifically confirmed. Indeed, only inside certain religious or sectarian dogmatic contexts such conjectures could pretend to assume the status of science.

In the field of microphysics, after the acceptance, in the first quarter of the twentieth century, of the orthodox quantum mechanics as the insuperable and final perfect theory, the picture is even darker. The Principle of Complementarity of Niels Bohr which stands as the very conceptual basis of orthodox quantum mechanics, whose mathematical expression are Heisenberg's relations, goes even further by establishing an insurmountable boundary for the human possibility of knowing. Accordingly, the orthodox quantum mechanics goes even further than relativity. In fact orthodox quantum mechanics claims that there is an insuperable limit, for our ability to comprehend. This limit is mathematically traduced by Heisenberg indetermination relations. Thus, within this restrictive perspective it will never be possible to know with accuracy both the speed and position of a corpuscle or of any other pair of conjugated variables. The better we know the speed of a corpuscle the less we know about its position or vice versa. Moreover, in this indeterminist theory and as a direct consequence of the Fourier ontology, where primacy is given to the ideal physically inexistent harmonic plane waves that occupy the whole space and time, the reality is, ultimately, a creation of the Observer.

Given the large concrete effectiveness of orthodox quantum mechanics in the present technology, it is not surprising that the pessimistic attitude of assuming concrete mathematical boundaries for the knowledge spread from the field of physics to practically all areas of human activity, particularly to arts. Furthermore, this indeterministic mode of thinking paved the way to the pretentious scientific justification for certain less clear activities that were previously regarded as marginal and devoid of any scientific content. Hence the flourishing, and enormous expansion of the irrationalism that we are presently witnessing. This real assault on Reason and Truth manifests itself in various ways, such as the occultism, the mysteries, magic, astrology, and the whole panoply of pseudo sciences that we are all aware of.

As I said, it is urgent, now more than ever, to defend the Truth and Reason. It was to this tough mission that I have dedicated my life.

I have shown, along the line initiated by the School of great French physicist Louis de Broglie and his disciple Professor Andrade e Silva, that it is possible to explain, the quantum reality in rational causal and intuitive terms, within the framework of space and time. Furthermore it is possible to prove that it is possible, not only conceptually, to go beyond the limits imposed to knowledge by Heisenberg relations, but also, from the practical experimental point of view, to go well beyond them.

The first time I showed in public that it was possible, at least from a conceptual point of view to go beyond the limits imposed to knowledge by Heisenberg relations was in the International Symposium on Fundamental Problems in Quantum Physics, in September 1993 in Oviedo, Spain, where I presented the communication *On the Uncertainty Relations*. The following year, at the Third UK Conference on the Foundations of Quantum Theory and Relativity at Cambridge, in September 1994, I presented the communication *On the Meaning of the Uncertainty Relations*. In these international scientific meetings I presented a more general mathematical expression for the uncertainty relations. These more general new uncertainty relations contain, formally, the common Heisenberg indeterminacy relations as a mere particular case.

Two years later, after my stay at the University of Rochester in the state of New York, I finally presented in September 1996 at the Oxford University, in the 5th UK Conference on the Conceptual and Philosophical Problems in Physics, at Merton College, in the plenary session before the closure of Congress, the talk, *Experimental Violation of Heisenberg Uncertainty Relations*. In this talk, before the world experts I showed that there are very special concrete experimental situations, which in their day-to-day deny the general claimed validity of Heisenberg relations. That is, there is a whole experimental field, in expansion, which is beyond the scope of the description of Heisenberg relations. Relations, that till then were supposed to be the last and final word. Indeed, these observations are made with the super microscopes developed recently. The practical effect of such facts is that presently, in our daily life, we have memory devices for collecting information that would be impossible to build if the pretentious limit of Heisenberg was in fact an insurmountable limit.

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