On Being and Non-being in Science, Philosophy, and Theology

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to be or not to be -
that is the question.
William Shakespeare, *Hamlet*

Abstract. The natural sciences have originated from Platonic-Archimedean tradition. However, since the Middle Ages philosophy and theology have been deeply rooted in the metaphysics of Aristotle, in which the notion of Being satisfies the principles of identity, excluded middle, and non-contradiction. This dichotomy has resulted in the separation of various types of cognition. However, the scientific revolution in twentieth century physics requires a new metaphysics with an ontology exceeding the classical ontological principles. Classical metaphysics would only be, in a way, an approximation of the new metaphysics, similarly as classical physics is the limiting approximation of quantum physics. This would render possible an opening of philosophy and theology to the mathematical natural sciences, and consequently would admit a better understanding of man, history, and maybe also of Trinitarian dynamics in the theology of God.

1. Introduction

The celebrated quotation from Hamlet, *To be or not to be*, symbolizes common belief that two opposite possibilities are mutually exclusive. We find the same faith in all types of human cognition: philosophical, theological, and even mathematical. For example, in mathematical (formal) logic, besides the law of identity ($p \equiv p$), which is tautologically true, this belief is expressed in the law of excluded middle (*tertium non datur*), asserting that the alternative of two mutually opposite propositions ($p \vee \sim p$) is also tautologically true. Conversely, the conjunction of these two propositions is false $\sim(p \wedge \sim p)$, which in turn is called the law of non-contradiction. In view of the development of the natural sciences, and in particular of quantum mechanics, it is not quite clear whether the two-valued logic is always consistent with Reality. Nevertheless, in metaphysics based on classical ontology, which recognizes ontological counterparts of the basic laws of the two-valued logic, we find the same dramatic question of Hamlet, based on the conviction that the existence of Being is entirely different from the non-existence of Non-being; Being exists and Non-being does not. Hence according to the classical ontological principle of non-contradiction: it is not true that *Being* is and is not.

Admittedly, classical metaphysics has long been very useful for Christian reflection, providing rational bases for faith. However, in spite of its many past successes, it is criticized at present. Truly, this is not only because of its low-sensitivity to the questions of historic evolution and the existential problems of man (e.g., the existence of evil). From the very beginning it has been clear for believers that the degree of existence somehow differs for beings, and that only God fully exists. Therefore, we already see a necessity to go beyond the static notion of Being. One should also realize that this Christian proclamation has gone well beyond these classical ontological principles. The Good News of the Gospel, which was «foolish» and nonsense to the Gentiles (1 Cor 1,21-25), has not bothered very much about the principle of non-contradiction. In any event, the paradoxical Truth about God-Man crucified on the cross and forsaken by God-Father is continuously demanding a new ontology.

Let me start with an important epistemological (methodological) comment. The relationship of theology and philosophy to science is difficult to determine because of its continuous evolution in the history of religion. Admittedly, there are different types of knowledge: theological, philosophical, scientific, and perhaps also artistic and poetic. But frankly, I feel that all these types of cognition could be regarded as different levels in the same house of Wisdom. Extreme isolationism is no longer possible, notwithstanding certain current tendencies. In spite of these popular inclinations, Rev. Michał Heller, the notable Polish philosopher, physicist, cosmologist, and theologian from the Papal Astronomical Observatory of the Vatican, has recently proposed an integrated view and has even constructed a program for the theology of science. I am grateful to him for the stimulating arguments of his book, ones which have inspired me to develop my reflection on this question[1].

The aim of this paper is to consider whether the achievements of the natural sciences can help in the search for a new ontology corresponding to

[1] M. HELLER, *New Physics and New Theology*, Biblos, Tarnów 1992 (in Polish).

such a theological way of thinking about the truths of faith, exceeding, in general, the principles of excluded middle and non-contradiction. Because I am a physicist, I will focus on the relations of philosophy to mathematics. Presumably, the theory of totally separated types of knowledge, without any common points, was mainly developed in order to defend theological truths against positivistic and materialistic arguments. In the twentieth century these erroneous interpretations of science have suddenly failed, but nonetheless the problem of the relation between faith and science still remains. Therefore, one should again ask the question what is the key obstacle in this relation. I hope that my contribution will be useful for progress in a dialogue among theology, philosophy, and sciences?

2. History

Olaf Pedersen, historian of science, formulated a thesis according to which the difficulties in the relation of Catholic theology to the sciences have resulted from the diversity of their traditions. Namely, theology was too strongly related to the metaphysics of Aristotle. On the other hand, the natural sciences have originated from quite different Platonic-Archimedean tradition[2].

2.1. Antiquity

In fact, we can say that the scientific papers of Archimedes originated from Platonic tradition with his own methodological correction. In order to understand the key problem of the conflict in question we need to go back to early Greek thought, which is based on Aristotelian and Platonic-Archimedean traditions. These fundamentally different traditions resulted in two philosophical attitudes, roughly identified as Realism and Idealism.

The differences between these two attitudes are well known. The basic thesis of Platonic philosophy can be expressed in the following statement: *Only eternal Ideas exist, things apprehensible by the senses are merely shadows of the Ideas.* Admiration of the surrounding world is the source of Aristotelian philosophy; the world is perfect because it is comprehensible. Hence the first question of his classical metaphysics is: *Why does Something exist rather than nothing?* Parenthetically, in the modern apophatic metaphysics one could ask: *Why does Nothing exist rather than something?* Contrary to Plato, Aristotle

[2] O. PEDERSEN, *Historical interaction between science and religion*, in: J. FENNEMA ET AL. (ed.), *Science and Religion: One World - Changing Perspectives on Reality*, Kluwer, Dordrecht 1990, pp. 139-160.

bets on experiment. His metaphysics begins with the things apprehensible by the senses, and by using the procedure of abstraction, he would like to acquire a reason for the existence of Being.

The main feature of Plato's later thought seems to have been a certain mathematicization. In his method mathematics plays an important part and is *a priori* in relation to experiment. Archimedes has developed Plato's method by applying also experimental verification of the mathematical models. Therefore, we can say that mathematics is *a posteriori* in the Archimedean method. However, for both of them mathematics remains very useful for studies of Reality. Aristotle himself had little use for this sort of mathematical metaphysics and rejected Plato's doctrine of transcendent eternal forms altogether.

According to Aristotle, mathematics is useless in identification of causes. He has even formulated the *metabasis* principle, excluding application of mathematics for describing Reality. Admittedly, it could only be incidentally useful in certain cases. Therefore, he should have looked for special arguments in order to justify why mathematics could provide certain good results in acoustics[3]. On the contrary, Plato writes in *The Republic* that one does not need to 'waste time' for observation of the path of the planets, because in advance one should know that the celestial bodies must move in orbits. Further, because a circle is the most perfect shape of a curve, orbits must be circular. In addition, the Archimedean correction to this method has appeared to be very fruitful. It may not be very surprising that the law of Archimedes is still taught in schools, but Aristotle's considerations about nature are merely of historical value.

Already from the beginning of Christianity, Platonic philosophy with later Neoplatonic modifications was well suitable to a purpose of *ancilla theologiae*. One should also note that conviction of distinction between Creator and creations is one of the greatest discoveries of the Old Testament. This conviction has been easily adopted by Christianity. Surely, the distinction between eternal changeless ideas and their material shadows has well fitted to the Christian belief in the transcendence of God. Moreover, Plato's anthropology with its doctrine of the soul and the body, even though not quite consistent with the biblical mentality, has been well accepted in the language of Christian spirituality. Certainly, this would not be possible without the great effort of the Fathers of the Church. Ultimately,

[3] A. FUNKENSTEIN, *Theology and the Scientific Imagination from the Middle Ages to the Seventeenth Century*, Princeton University Press, 1986.

St. Augustine has provided very profound metaphysical grounds for the Christian faith. He has fused the religion of the New Testament with the Platonic tradition of Greek philosophy. Undoubtedly, faith is fundamental for him, preceding its understanding, as he asserts in his great treatise *De Trinitate (On the Trinity)*. In summary, Augustinian tradition has provided the following formula: *Fides quaerens intellectum*. And till the Middle Ages theology was basically Platonic.

2.2. Middle Ages

However, in the thirteenth century the situation suddenly changed when the influx of Arabian-Aristotelian science aroused a sharp reaction among believers in Europe. The main difficulty was that Aristotle's thought did not fit well to Christian thought. In this case we had things apprehensible by the senses instead of Platonic Ideas. These beings and the material world were linked together more strongly than it was seemly for religion philosophy. Moreover, this was a static vision of Reality, in which the nature of Being is eternal and changeless without any room left for creation[4]. Therefore, it was not surprising that several times Church authorities tried to block the influence of Aristotelian philosophy on Christian theology.

We should appreciate the fact that Thomas did not fear these new ideas. After all, for the first time in history, Christian believers and theologians were confronted with the rigorous demands of scientific rationalism. Actually, St. Thomas had interpreted Aristotle's philosophy in consistency with religious truths. Obviously, he also developed his own conclusions from Aristotelian premises, notably in the metaphysics of personality, creation, and Providence. In this way his masterpieces became the basis of Christian theology till today.

Undoubtedly, St. Thomas's main intention was to provide rational bases for faith. Therefore, according to his way of thinking, the work of the mind is first and belief comes after.' Naturally, the Intellect is fundamental for Aquinas and precedes faith. To sum up, Thomist tradition has provide the following formula: *Intellectum quaerens fidem*. The conviction that faith and reason are not in conflict is characteristic for both great Christian scholars:

[4] E. McMullin, *Introduction*, in: Id. (ed.), *Evolution and Creation*, Notre Dame University Press, 1985, pp. 16-21.

neither does faith oppose reason, nor is reason against faith; only the directions of their implication's are quite opposite.

By adapting Aristotle's philosophy to Christian thought, St. Thomas probably expected that he would come into contact with the mathematical natural sciences. Certainly, one should realize that this unique opening of the Church to natural science was extremely fruitful for the development of Christian belief. But one should also remember that science did not yet exist in the thirteenth century, at least in the present meaning. Aristotle's physics was based on sensible concretes. That is why mathematics, in his view, was helpless in studying the sensible world. Presumably, also the notion of Being satisfying the classical ontological principles of excluded middle and non-contradiction is acquired from the common-sense world by the way of abstraction. From a historical perspective, we can presently say that Aristotelianism with its static notion of Being, and by rejection of the applicability of mathematics to describing nature, had open the way for science, which has recently appeared to be closed, notwithstanding the successes of the past.

2.3. Modern Science

Science in its modern meaning was only founded in the seventeenth century. Certainly, its foundations had been prepared by the continuous interaction of Greek philosophy and Christian thought. In fact, the founders of the classical revolution in science, such as Isaac Newton, Johannes Kepler, and Galileo Galilei, were all profound believers. However, because of historical circumstances modern science was not interpreted favourably towards religion. We already know that this had often happened because of misunderstanding.

Classical physics did not engage in dialogue with Aristotelian philosophy and did not quarrel with its premises but simply ignored them. Its new world and new manner of understanding Being was again ... Platonic. For example, owing to Kepler we know that planetary orbits in the Solar System are not exactly circular, as Plato has expected; in fact, they are elliptical. However, it is worth noting that the quotient of two semi-axes of the ellipses is, in practice, close to the value of unity. In the academic language one would say that the ideal symmetry of the orbits is somewhat broken. That is way, and not by chance, Plato's statements about nature are not very far from being true.

It is clear that Newtonian physics was only possible due to mathematical studies on the ideal notion of infinity. In particular, a notion of a quotient of two infinitesimally small quantities (differential calculus) and a notion of a sum of infinitesimally small quantities (integral calculus) allowed the study of motion of material objects. In this way, classical mechanics has become a basis of a dynamic vision of the ambient world. Naturally, these idealized notions have also their counterparts in sensible experience. For example, consider the notion of a material point. One only need to assume that the size and the shape of the moving object are of no consequence in the problem being considered. Let's take instantaneous velocity, which is a quotient of an infinitesimally small difference in position of the material point and an infinitesimally small change in time. Naturally, it corresponds to the indication of the car speedometer; it is enough to perform a certain idealization of what is observed.

On the other hand, knowledge acquired by use of the senses can also be misleading. For example, it would seem that motion of bodies necessarily requires an acting force. However, this is an illusion. Actually, the car is moving with a constant speed because the force of the engine equilibrates the friction force. In space, in the absence of friction, a spacecraft can move with its engine switched-off. As Newton's first law of motion states: every material point persists in its state of uniform motion in a straight line (or at rest) until the action of other bodies compels its to change that state; the action of force is only necessary to change its motion (Newton's second law). In order to understand the nature of motion, one should forget about the senses and imagine ideal situations, e.g., ideally straight line motion in frictionless media. Furthermore, a trajectory of the moving body is a solution of mathematical equations; mathematics is not only science about quality, as was understood by Aristotle, but here one can already see elements of a structural vision of nature. In other words, we would presently say that mathematical structures are modelling certain features of the physical world.

3. Twentieth Century Science

Only in the twentieth century, however, we have a veritable revolution in the natural sciences owing to the foundations of three great physical theories: special relativity, general relativity, and quantum mechanics. Quantum mechanics is modelling the world at very small distances (microphysics), while special and general relativity refer to large velocities (as compared with the speed of light) and strong gravitational fields, respectively. It is still not clear how relativity is related to quantum mechanics.

Here, mathematics is not only the language of these theories, serving as a powerful instrument for our knowledge and mastery of nature, but mathematics has also become the material of the ideal world of these theories. Furthermore, the mathematical structures used by physicists for modelling the world do not have any natural perceptible counterparts. For example, hydrogen atoms or elementary particles (e.g., protons, electrons, neutrinos or photons) are described by the wave functions that are in turn elements of an abstract Hilbert space. What is observed results from a mathematical procedure of the projection of these abstract elements onto certain sub-spaces. It would be difficult to find a better metaphor than Plato's metaphor of shadows seen by prisoners on the wall of the cave. Imagine the objects outside of Plato's cave, or say the statues on the balustrade that are producing shadows in the light of the fireplace. According to Carl F. von Weizsäcker, the German physicist and philosopher, co-founder of quantum mechanics, these statues should be considered as fundamental objects of nature, which are subjects of study of theoretical physics. Hence these statues are real atoms or real elementary particles. But in experiment, which is non-trivial extrapolation of our senses, we can only observe shadows of these true objects, i.e., the properties of the real atoms or the real elementary particles.

It would seem that at least classical physics - describing phenomena at large scales and at velocities small as compared with the velocity of light - remains consistent with our sensible imagination. But also in this field of science we have again a surprising revolution. Admittedly, it is true that the classical sensible world contains a multitude of shapes, forms, and structures. According to Aristotle, any conjecture that such a wealth of variety of forms might result from any mathematical ideas would be rather absurd. However, one should remember that the mathematics of antiquity originated in the needs of daily life and was practically limited to Euclidean geometry. From that time mathematics has developed into an immense system of various disciplines.

I would like to give just one example from only one of its disciplines, topology. In 1883 Georg Cantor, the German mathematician, invented a curious mathematical structure. Our Figure schematically shows how to construct Cantor's set. We start with the closed interval, say of unit length.

We divide this interval into three equal parts and remove its open middle third, i.e., we delete the interval (1/3, 2/3) and necessarily leave the endpoints behind. This produces the pair of closed intervals, each of length one-third. Then we remove the open middle thirds of those two remaining intervals to produce four closed intervals, each of length one-ninth, and so on; we repeat this procedure an infinite number of times.

The limiting set is the Cantor set, called also the Cantor dust[5]. It is difficult to visualize, but the Figure suggests that this dust consists of an infinite number of infinitesimal pieces, separated by gaps of various sizes. The total length of all intervals removed is equal to the length of the initial interval. Thus, the remaining length must be zero. Therefore, in the Cantor set the number of points is obviously infinite but their total length is zero. Even more paradoxically, one can demonstrate that elements of the Cantor set may be placed in a one-to-one correspondence with the elements of the initial interval of length one (real numbers). It can be proved that the number of elements of the Cantor dust (of length zero) is exactly the same as the number of elements of the full interval (of length one). One may say that nothing is full of everything. Therefore, this mathematical structure is so curious that it has even been considered pathological. Extension of the above to the two-dimensional case of a square (or triangle) was done by the Polish mathematician Wacław Sierpiński, in 1916, and his construction is known as the Sierpilski carpet (or gasket).

Recently, owing to the works of Benoit B. Mandelbrot, we know that such mathematical curiosities, abstract as they seem, have now found a place in the study of dynamic systems. Mandelbrot coined the name *fractal* from the Latin adjective *fractus* (means fragmented, divided into irregular fragments)[6]. He has also codified and popularized fractals. Naturally, the Cantor set is an example of a fractal. The fractals are very useful to describe the complicated structure of objects in the real world such as clouds, mountains, coastlines, and the bark of trees. In 1971 David Ruelle and Floris Takens proposed a new theory for the onset of turbulence in fluids, based on abstract considerations about so-called strange attractors. Due to the development of nonlinear dynamics, we are now convinced that the strange attractors that have fractal structure can be applied to a description of various complex phenomena in nature, such as convection in the atmosphere (weather prediction), earthquake prediction, chemical reactions,

[5] I. STEWART, *Does God Play Dice? The New Mathematics of Chaos*, Penguin Books, 1990.
[6] B. B. MANDELBROT, *The Fractal Geometry of Nature*, Freeman, San Francisco 1982.

electronic circuits, fluctuations of the populations of animals in biology, ecosystems, mechanical and biological nonlinear oscillations, especially circadian (roughly 24-hour) rhythms, heart rhythms and fibrillations, and even epilepsy[7]. Finally, it is worth noting that *complexity* is derived from simple mathematical rules, and not from a variety of causes; fractals are convenient measures of complex reality.

Incidentally, scientists are now commonly convinced that there is *One* simple law at the base of all complex phenomena in nature; all the Universe is subject to this unique law. Hence the multiplicity and complexity of laws are illusionary. The new physics is continuously searching for such a fundamental principle from which the other laws should be derived. Further, what modern physicist are doing in search of One Theory of Reality recalls Plato's argument regarding the shape of planetary orbits. Namely, they believe that laws result from symmetries, which should be compact and simple at their fundamental form, from which the wealth of structural details results. These symmetries are characterized by inherent beauty. Therefore, one should not 'waste time' asking questions of what might be the fundamental nature of Reality. After all, we already know in advance that God should have used these symmetries for the creation of the Universe. Hence, in a way, in contemporary physics the aesthetic criterion becomes an epistemological criterion of truth. The only problem is that we can never be sure as to whether there exists a mathematical structure which is even more beautiful than those that have already been found.

In the near future we can expect even more paradoxical concepts referring to the notion of *existence*. For example, scientists are continuously trying to unify the physical theories, including quantum physics and relativity. However, in attempts of quantisation of spacetime there arises the question of the existence of physical objects in space and time. Maybe one should rather speak about 'quanta of existence', which is not compatible with changeless Being. However, these speculations go well beyond the scientific horizon of the now coming to a close second Millennium after the birth of Christ.

4. About the Possibility of a New Ontology

One should remember that the fundamental question of the interpretation of quantum mechanics, founded at the beginning of the

[7] Cp. I. STEWART, *Does God Play Dice? The New Mathematics of Chaos*, cit.

twentieth century, is not yet understood clearly in terms of Reality. Indeed, it was necessary to abandon sensible imaginations; one can imagine that it was not easy. Roughly, we have at least two possible approaches: ontological (the Copenhagen school) and epistemological (genuine statistical) interpretations of the wave functions describing microphysical objects.

Albert Einstein, who preferred a statistical interpretation of the wave function, defended the realism of nature. In my view, his concept of hidden parameters, which was formulated in order to save physical reality, was deeply rooted in the common conviction of a simple concept of reality. Consequently, the famous founder of two great relativistic theories and co-founder of quantum mechanics did not believe that quantum mechanics could fully describe the real world. In 1935 Albert Einstein, Boris Podolski, and Natan Rosen formulated a well-known paradox and proposed a local realistic theory of nature[8]. In a nutshell, their reasoning can be summarized as follows. Because no influence of any kind can propagate faster than the speed of light, and assuming that induction is a valid way of reasoning in quantum mechanics, we cannot reconcile two obvious premises: one is realism, phenomena are causes by a physical reality whose existence is independent of human observers, and second is local causality (assuming independence of well separated objects). One cannot reject any of these self-evident truths. Hence one is led to conclude that the description of reality as given by a wave function is not complete.

One may also look at this paradox from the point of view of believing in the principle of non-contradiction. And this was probably the justification of the Einstein's objections, which was expressed in his celebrated letter to Max Born: *You believe in a God who plays dice, and I in complete law and order.* Admittedly, Einstein had not seriously taken into consideration that there are two well-justified approaches to the problem of Reality. One approach tries to defend the principle of non-contradiction. In this case quantum-mechanics cannot be fully true, or at least quantum-mechanical description of physical reality cannot be considered complete. On the other hand, there is the other possibility defended by Niels Bohr, Werner Heisenberg and many others (the Copenhagen interpretation) The basis of Bohr's criticism was that Einstein's use of induction was unwarranted. Consequently,

[8] A. EINSTEIN, B. PODOLSKI, N. ROSEN, *Can quantum-mechanical description of physical reality be considered complete?*, Physical Review 47 (1935), 777-780.

quantum-mechanical description is true and complete[9]. One may also say that the principle of non-contradiction is not valid in microphysics. Simply because so strange is the nature of the quantum world. Paradoxically, many laboratory tests show that Einstein was altogether likely wrong; the bizarre nature of the quantum world must be accepted, in spite of a lack of nourishment for sensible imagination. Notwithstanding the variety of ways of understanding this difficult problem[10], there is no doubt that quantum mechanics requires a new philosophical concept of *existence* of objects in nature, and even a new dynamic concept of *Being*.

It also seems to me that science and, in particular, physics are surprisingly well consistent with the dynamic Platonic-Augustinian concept of Being. Therefore, physics can help, or at least be a good adviser, in the search for a new ontology. Naturally, one should also appreciate the Aristotelian-Thomist approach. I feel that nowadays St. Thomas would not follow exactly any static philosophical vision elaborated before the actual foundations of science. After all, his intention was an opening of theology and philosophy to the knowledge of nature that was acquired during his times, in order to provide rational bases for faith. We ought to follow his attitude, though taking also into account signs of our times. Naturally, this is not possible without the opening of thought to the most important ideas and achievements of the twentieth century.

In addition, in both Augustinian and Thomist approaches faith was not in at variance with intellect. This demonstrates that science, philosophy, and theology need to be neither in conflict nor in separation. However, one should not necessarily identify the concept of intellect with common sense, which could be very misleading, as it has often happened in the history of science. Under this condition this new ontology must not be irrational, notwithstanding some strangeness for our senses and inconsistency with the two-valued logic. Surely, we have already know that such a logic does not work at the level of microphysics. Therefore, we cannot expect and demand that it should be obligatory at the ontological level. I hope that the new ontology will open new horizons with the perspectives that have not been available up till now. This would render possible a better understanding of nature, man as a person with his existential problems and social relations,

[9] N. BOHR, *Can quantum-mechanical description of physical reality be considered complete?*, Physical Review 48 (1935), 696-702.

[10] B. D'ESPAGNAT, *In Search of Reality*, Springer-Verlag, New York-Berlin 1983.

history of mankind, and maybe even a better intuition of Trinitarian dynamics in philosophy and the theology of God.

At the end of my reflections, let me present an interesting physical illustration of this new ontology. In 1935 Erwin Schrödinger proposed a famous '*gedanken*'-experiment, with a metaphor of a cat, which is known as Schrödinger's cat in academic literature. We can think about a photon, i.e., a fundamental unit of light that can behave like either a particle or a wave. According to quantum mechanics the photon can exist in an ambiguous state until a measurement is made. If a particle's property is measured, the photon behaves like a particle, and if a wavelike property is measured, the photon behaves like a wave. In our experiment the photon impinges on a half-silvered mirror. The photon has a probability of, say, one-half of passing through the mirror and a probability of one-half of being reflected. If the photon is reflected we observe its wavelike property (e.g., an interference pattern) and nothing dramatic happens. On the contrary, if the photon passes through the mirror, it is detected by the photodetector in a box. The detection actuates a device that brakes a bottle of cyanide, which in turn kills the cat in the box. Remarkably, due to a certain switch, the photon could not have been informed whether to behave like a particle or like a wave until it is registered. Hence, it cannot be determined whether the cat is dead or alive until the box is opened.

There would be nothing paradoxical in the outcome of this experiment, if the passage of the photon through the mirror were objectively definite but merely unknown prior to observation. However, according to quantum mechanics, the passage of the photon is objectively indefinite, and so is the aliveness of the cat. One may say that the cat is suspended between life and death until it is observed. The conclusion is paradoxical, but still it concerns only the results of a thought experiment. But truly this is not pure speculation. In fact, something similar to Schrödinger's thought experiment has been achieved by a number of groups of investigators in scientific laboratories.

To summarize, at present there is good evidence that the bizarre nature of reality must be accepted. Because of the wave-particle duality, it is not anymore possible to limit our thoughts to a concept of Being, which satisfies the fundamental classical ontological principles of excluded middle and non-contradiction. In the language of philosophy we could even say that at the level of the microworld Being is *and* is not.

5. Conclusions

If we do not like to continue philosophical and theological studies in separation from science, then classic metaphysics should open its thought to the most important ideas and achievements of the mathematical natural sciences. In particular, twentieth century physics requires a new metaphysics with ontology exceeding the classical ontological principles. The classical (and possibly apophatic) metaphysics should only be a limiting approximation of the new metaphysics.

The way of the limiting implication would probably be analogical just as quantum physics and relativistic physics would be the limiting cases of the new fundamental physical theory, containing both quantum and relativistic physics. Similarly as is in the case of classical physics describing the world of the senses, which in turn is the limiting approximation of quantum physics.

I hope that this dynamic concept of *Being* will shed light on the nature of the Universe, with man in his existential and historical dimensions, and maybe even will render possible a better intuition of God in His Trinitarian dimension. Finally, *To-Be and Not-to-Be*, that is the question for the new metaphysics?

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