HERMENEUTIC PHENOMENOLOGY AND QUANTUM PHYSICS: THE HERMENEUTIC PHENOMENOLOGICAL QUANTUM EXPERIENCE

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Physicist John A. Wheeler describes the role of the participator in regards to quantum physics by saying,

> May the universe in some strange sense be "brought into being" by the participation of those who participate... The vital act is the act of participation. "Participator" is the incontrovertible new concept given by quantum mechanics. It strikes down the term "observer" of classical theory, the man who stands safely behind the thick glass wall and watches what goes on without taking part. It can't be done, quantum mechanics says.[1]

Within the history of science, particularly physics, there was a paradigm shift from classical to quantum physics. This was, mainly, the consequence of classical physics' failure to account for phenomena within the atomic/subatomic domain, where movement, for example, unlike that of the classical world, is constituted by quantum jumps and untraditional behavior. In the classical world, the observer is a subjective external consciousness, so to speak, describing objective phenomena of nature by mathematical language. In the quantum world, the participator is a corporeal consciousness who is a part of the whole intersubjective experience of probabilities of events within nature.

Classical physics assumes, within its categorical framework, that the world is the instantiation of pure a priori ideal mathematical objects. In quantum physics, on the other hand, it is not even possible to give a pure description because the world is constituted by partial, context-dependent, scientific, cultural knowledge. This is due to the fact that consciousness is part of the process of scientific measurement, as much as, it is a part of the participator who performs such measurement. Not only that, but the probabilities of the quantum world are not independent and separate from other entities, such as particles, that are, only seemingly, unrelated:

> Consciousness may be associated with all quantum mechanical processes...since everything that occurs is ultimately the result of one or more quantum mechanical events, the universe is "inhabited" by an almost unlimited number of rather discrete conscious, usually non-thinking entities that are responsible for the detailed working of the universe.[2]

Since quantum physics is the physics of possibilities and probabilities, not purely descriptive, is contextually interpretive and consciousness dependent, there is an involvement of hermeneutic phenomenology alongside the transcendental phenomenology that's normally present in the scientific domain.

From philosophical grounds, on the other hand, the view is not only that metaphysics goes beyond physics, but also existence precedes measurement. Phenomenology, consequently, is first philosophy and studies the preconditions of human experience of empirical phenomena qualitatively as much as quantitatively. There is, accordingly, the idea of, for instance, the pre-structure of understanding, where meaningfulness is based on assumptions and starts with presuppositions. This pre-

structure is a dynamic part of the hermeneutic circle, which influences the process of interpretation and understanding.

In this paper, I will use some quantum interpretations, such as that of Niels Bohr, to show how consciousness, within hermeneutic phenomenology, participates in creating reality. I will, namely, use the phenomenon of duality of particle/wave and the collapsing of the wave function to accomplish that. Then, I will elaborate on the ontology of phenomena, which consciousness is conscious of in the quantum world, and I will use David Bohm's interpretation as my guide to explain the hermeneutic phenomenology involved. After that, I will, briefly, compare the experiences of phenomena within classical physics and quantum physics, where the former is characterized by observation and the latter by participation. This includes the notion that both, sometimes, overlap. Finally, I will discuss the quantum experience in light of hermeneutic phenomenology, leading to what I call "the hermeneutic phenomenological quantum experience" and what it means.

1) *How Does Consciousness Manifest Reality?*

From the concept of relativity and illogical paradoxes of the quantum world, a philosophical paradigm emerges, where we significantly create physical reality. We are no longer bystanders. We are participators, where observer and observed are interrelated in a real sense. Total separation, thus, between what is here and out there is an illusion. Niels Bohr describes such reality by saying,

> An independent reality in the ordinary physical sense can be ascribed neither to the phenomena nor to the agencies of observation.[3]

Although agencies of observation are instruments of measurement and not necessarily human beings, this, however, means that the world is not only a collectivity of things but is also constituted by interactions. Properties, here, belong to interactions and not, for instance, to the independent existence of light. This enabled Bohr to solve the particle/wave duality. This, so called, duality[4] is a characteristic, not only of light, but of everything in the Cosmos, where it is a metaphysical fact.

The particle/wave duality is when the same atomic object, such as a photon, behaves, sometimes, as a point-like particle and, other times, like a wave spread over space in time. The question, of when each takes place, depends on whether the atomic object is observed or not. Consciousness is, therefore, in the heart of what is taking place here and this is a case of hermeneutic phenomenology. It is hermeneutic even within the discipline of physics due to the different interpretations made by physicists. Each interpretation offers a unique perspective, which has been mathematically proven. Erwin Schrödinger, for example, used a wave equation to determine the probability of a particle's location within space and time. This equation described reality in terms of waves. Schrödinger, furthermore, proved that Werner Heisenberg's matrix mechanics and his own wave mechanics were in fact equivalent, and represented different interpretations of the same theory.[5]

The idea of probability waves, as proposed by Bohr and his colleagues,[6] even though failed mathematically at first, was the beginning for solving the particle/wave duality paradox. The idea spoke of tendencies of happenings. In this sense, probability waves were the mathematical representation of what could happen, if it did happen, how it would happen. According to Heisenberg,

> It meant a tendency for something. It was a quantitative version of the old concept of "potentia" in Aristotelian philosophy. It introduced something standing in the middle between the idea of an event and the actual event, a strange kind of physical reality just in the middle between possibility and reality.[7]

Unobserved photons, for example, are waves of possibilities spread in space and time but the second they are observed, they are collapsed into particles of manifestation. Some questions, now, come to mind. What kind of an act is the action of observation and why would such an act cause such results? To answer this question, I would like to make the move from physics to metaphysics. This is due partially because metaphysics is not limited by the language of mathematics and its symbols and partially because metaphysics is beyond physics.

First, I would like to assume that waves and particles are the same entity. They, both, are energy. This means that when physicists talk about a wave that collapsed into a particle, they are actually speaking of the same entity that went through two different forms. The only difference is that when unobserved, waves exist as mere tendencies. They are states of becoming. On the other hand, when observed particles exist as point-like particles, they are reality manifested, tendencies realized and actualities rather than possibilities. They are states of being.

Second, The act of observation is an act of consciousness. Unobserved waves are unconscious of states of becoming. Observed particles are conscious of states of being. The degree of awareness on the part of the observing being is in relation to the degree of consciousness. Awareness and consciousness are different variations of the same entity just like waves, particles, energy and matter also are. Awareness is a product of the brain and consciousness is a product of the mind. Brain and mind are two different variations of the same entity, just like ice and water. Everything is energy including mind, brain, consciousness, matter, awareness, water, ice, you and me. Everything is different because there are different degrees of energy and different degrees of movement and vibration. From another view, observer and observed are one. Both are particles of energy vibrating to be. Simply put, the action of observation is a relationship between both the observing consciousness and that which is observed. This relationship is reciprocal and not necessarily symmetrical.[8]

To answer the second part of the question, why the act of observation would result in the collapse of the wave function to what is viewed as a point-like particle, we need to understand what took place during the act of observation and even before it. Waves (particles) move longing to meet their antiparticles. An unobserved waving electron, for example, moves in tendencies longing to reach its ultimate state of being, which is meeting its antiparticle, the positron. It's important to note, here, that longing and these tendencies are not the results of desire and are not to be confused as such. The actual reason for this quantum behavior is the quantum characteristics of particles such as, their charge (negative, positive, or neutral), mass and spin. The negative charge of an electron, for example, pushes it to seek its antimatter partner to reach a state of harmony, unity or the singularity in which it originally started from (the Big Bang).

During the act of observation, the observing consciousness calls the wave (electron) into being (particle). The observing consciousness manifests the observed particle as an actuality rather than a further possibility. The particle's long journey, thus,

is cut short by its newly established relationship with the observing consciousness. Basically, it is easier for the electron to be satisfied with what could be of 60% certainty rate that its positron exists right here and now, rather than a 20% certainty rate that its positron might exists in space X in time X millions of light years away. This strength of probability depends mostly on the observing consciousness, especially to its degree of awareness. An observer's degree of awareness and certainty during an experiment in a physics lab is not the same as that of an observer living everyday life during a road trip, for example. The idea of a wave collapsing is normally more possible to the first, which dictates the strength of a probability of a wave actually collapsing. Simply, the degree of actuality of an event happening depends on the observer or, more accurately, the participator. Such varying degree of awareness, furthermore, gives rise to varying concentration and intensity of consciousness.

The rest, of course, happens at the instant of the wave collapsing into a particle of manifestation. The observing consciousness, being energy itself, forms the relationship that the wave was, originally, longing to accomplish. The result is the manifestation of the now particle within this dimension, rather than the supposed possibilities and tendencies of waves taking place within the unobserved next dimension. Now, the particle of manifestation is observed in this dimension and is dead (zero or very small possibility) within what seemed only to the human mind as a totally separate dimension of void.

2) *Quantum Ontology:*

It is a given that when consciousness is involved, interpretation will be there, but what are we interpreting? What is it that we are consciousness of here? More specifically, what is the ontology of quantum reality that consciousness is aware of? To shed some light on this hermeneutic phenomenology, I would like to use David Bohm's book, The Undivided Universe, as my guide.

When it comes to the ontology of the quantum world, basically, the thought of essence is an appearance, which represents a reality. Such reality, additionally, depends on broader contexts and further levels, where an unbroken wholeness of reality gives rise to appearances. This is similar to the abovementioned indivisible quantum phenomena of Bohr's, where, even, the measuring apparatus is not totally independent. If this extension of appearance, relating to thought, seems Kantian in its core, although with differences, that's because it is. This view of scientific realism is similar to Kant's account, where he believed, differently, that views of physical reality only pertain to the phenomenal world and that the thing-in-itself cannot be totally known. Bohm's view differs, however, especially, in that some aspects of, the so-called, mind-independent-reality can be known. This ontological view, moreover, relates to some aspects of Heideggerian and Merleau-Pontian ontologies. An essence of a specific quantum level, for Bohm, can later be seen as an appearance of a further fundamental essence.[9] Quantum theories, accordingly, are not strict forms of knowledge but insights and interpretations of possibilities, which develop through further understanding leading to deeper visions of the nature of reality as a whole.[10]

Bohm, integrally, interprets ontology as the ontology of dependent beings and not ontology of independent substances. When light, for example, comes from an object to the eye and the eye reflects an image, which is delivered to the brain, it is part of the

reality corresponding to the produced appearance. This reality does not exist independently. It depends contextually on the original object and the essential meaning of that specific appearance to the involved consciousness. The object, furthermore, is dependent, in its existence, on a wide range of contextual parameters—e.g., temperature and atomic constituents—as we go through a series of deeper essences and appearances.[11] In the quantum world, in fact, according to Bohm, there is not a complete defined distinction between appearance and reality or, even, appearance and essence. This is due to the manner of how beings participate, irreducibly, in each other, where there is an impossibility of locating an independent essence that gives rise to an appearance. This is holistic quantum ontology, where essence and appearance are a totality.[12] For the interpreter, thus, appearances show themselves as results that are observable in the apparatus. An essence, on the other hand, is the whole quantum ontology of quantum fields and particles, including those of the apparatus and the observed system.[13]

In the heart of this flux, furthermore, a critical aspect lies, which is information. Each quantum entity carries information telling a story and shows itself from itself to those who are open to see and experience the all-pervading unity. Hermeneutic phenomenology, consequently, can examine the implicit meaning and context of the quantum world, especially in the manner in which quantum physics returns from the transcendental world of classical physics to the lifeworld of human experience, where contextuality is exemplified in the participatory act of observation and where the human subject becomes the embodied consciousness, which mediates the epistemic interaction with the ontology of what is observed. The emphasis, here, is on the intersubjective experience of the wholeness of it all, including the corporeal consciousness and observable objects. Such ontology and any epistemic relation to it are definitely not contextual, historic and/or culture-free.

3) *The Epistemic Experience and its Consequences, Classical Physics vs. Quantum Physics:*

One way of gaining scientific knowledge is through discovery. This is true, especially within the categorical framework of classical physics, where the observer, as described above, is a human subject who observes an object. This categorical framework is characterized by entities that are observable, measurable and repeatable. The new physics added quantum interpretation as a method of participation. Where there is knowledge through interpretation, hermeneutic phenomenology will be there.

Knowledge through discovery has some basic characteristics. First, the world exists outside the mind and is available for discovery. Second, knowledge is acquired through observation and, often, by using scientific methods and tools—e.g., microscopes, telescopes, x-ray machines, etc. Third, knowledge aims at being objective and accurate. Fourth, can such knowledge be verified? This means that knowledge by observation, alone, could be misleading in the case of optical illusions, where, for example, one could see a bent pole just because its lower half is submerged under water and, thus, it has to be verified.

Knowledge through participation, as well, has some basic characteristics. First, reality (the world) and mind are interdependent. Second, anything known requires a knower. This requires presuppositions, assumptions, concepts, expectations, involves the historicity of the interpreter and that which is interpreted and an openness allowing for

the meeting between such historicities. Third, knowledge is the result of understanding, which is made possible by interpretation that depends on the requirements mentioned in the second characteristic. Fourth, different interpreters/observers see things differently. They assign meanings differently and conceptualize events differently. This could be due to differences in language, culture, religion, etc—everything that constitutes what I call historicity. Fifth, knowledge is shaped by pre-understandings. To know is, mainly, to understand the pre-understandings, which made the knowledge possible. Sixth, a significant part of knowledge is to reflexively identify the various ways of knowing the world, including, for example, the specific constituents of the object of interpretation.

4) *The Lived Hermeneutic Phenomenological Quantum Experience:*
When the integrality of all that is and the role of our consciousness in creating reality, as displayed by quantum physics, is approached with hermeneutic phenomenology, understanding ceases to be only temporal, intentional, historical and contextual. It, in fact, becomes more than a mental activity. It becomes a way of being, where the whole hermeneutic process, literally, brings being (a particle) into light. This structure of being gives rise to the possibility for understanding and experiencing within the quantum level. This is, comparatively, the Heideggerian notion that understanding is not a mere faculty, but a mode of being-in-the-world as well. Understanding (and, generally, conscious acts), here, is the medium by which the world comes to be. Understanding is the medium of disclosure of such world and after the shift from the detachment, of classical physics, to the integrality, of quantum physics, such understanding, also, becomes the understanding of firsthand experience. This empiricism and its interpretation and understanding rely on being-in-the-world and on each phenomenon in its manifestness. It's the hermeneutic phenomenology of existence.

When it comes to the hermeneutic phenomenological quantum experience, to understand is to experience, and a major part of such experience is fully living the experience. Experience, here, is not the mere subschema within the framework of the subject-object duality and it is not only the non-historical, non-temporal abstract, where consciousness receives certain sensations. Experience takes place in a world of living historical human beings, where one learns through living the experience primarily and immediately, and secondarily through precepts. Hidden within this is an element of negativity. In the quantum experience, one learns what one did not know before and did not expect. In this experience, there is a shattering of classical expectations, where one has no option but to emerge as a wiser person.

Inquiring from outside experience as to its structure, what is noticed is the temporal character of its relation to expectations developed in the past, held in the present and extending into the future. Lived experience contradicts expectations and, therefore, as the highest authority, has no substitutes. Similar to language, experience cannot be an object for us, yet it, invisibly, participates in every way of understanding. One who is experienced cannot absolutely and fully put one's experience in precepts. One might be able to explain such experience very well or write a book about it, but cannot make another, exactly and fully, experience that which was originally experienced. The wisely experienced, therefore, has grasped the limitations and finitude of expectations, and not only knowledge. Experience, here, has not taught mere facts or a solution to a problem,

but how to expect the unexpected and, thus, leads to the openness to new experiences. One, consequently, grasps the shortcomings of knowledge compared to experience.

The shift, from the classical to the quantum paradigm, has brought the hermeneutic phenomenological quantum experience to the forefront by moving from simple knowing to the hermeneutic experience. This does not only include the encompassing and non-objectifiable experience, but, additionally, its dynamic dialecticality. The negativity of inquiry, which, as seen above, teaches and leads to transcendence, is in the center of the hermeneutic experience. For to experience is not only to understand better, but also differently, where one is not only told what one has expected but to transcend by negating such expectations. To truly experience, thus, is not only understanding better what one already understands so much as what one understands wrongly.

When it comes to the hermeneutic phenomenological quantum experience, we cannot understand differently if we ask all the questions. This is because a question posits a preliminary way of understanding, since understanding is not empty and already contains presuppositions and expectations. This is, of course, besides allowing quantum phenomena to take their course by revealing themselves and putting forth their own reality. The idea, here, is that our own presuppositions are not absolute and are subject to change. Questions of inquiry, however, seem not to suspect their own guiding presuppositions but rather to operate within a system, where the answers are often potentially present and expected within such system. They are, therefore, not true questions but rather manners of testing. True experience, though, does not follow the manner of solving a problem within a system but a means for reaching outside through creative transcendence and abolishment of the system. This is how a new fresh understanding emerges, takes the lead and transforms the experiencer's character. This is a new alternative to analytical blindness. This creative negativity, in addition, is the ground of true dialectical questioning.

The intersubjectivity of quantum reality gives rise to dialectical questioning, which does not only explore quantum phenomena but allows such phenomena to explore back, where the experiencer's own historicity is called into questioning, leading to fundamental transformation of one's understanding and life. This is not the denial of one's historicity but the transcendence to a more developed one. For in a true experience, through partial creative negation, a more encompassing understanding emerges. In this quantum experience, both, experiencer and that which is experienced are in dialogue, where questioning goes both ways.

To conclude this paper, I would like to start by offering Marlin W. Donald's description of consciousness, where he says,

> What consciousness is really about... is much deeper than the sensory stream. It is about building and sustaining mental models of reality, constructing meaning, and asserting autonomous intermediate-term control over one's thought process, even without the extra clarity afforded by the explicit consensual system of language. The engine of the symbolic mind, the one that ultimately generates language to serve its own representational agenda, is much larger and more powerful than language, which is after all its own (generally inadequate) invention.[14]

This human consciousness, according to quantum physics, is a part of a wholeness that goes beyond it. It is submerged within the flux of the Cosmos. Its relation to mere rational activities, as a result of the birth of quantum physics, is a thing of the past and, therefore, its role extends beyond the limits of transcendental phenomenology. According to quantum physics and other disciplines, consciousness has the ability to participate in and create reality. Part of such reality is its own hermeneutic phenomenological quantum experience. This experience is not only vital to one's own life but to everyone and everything else. This experience, additionally, has existential, ontological, epistemological and even normative significance.[15]

NOTES:

1) John. A. Wheeler, K. S. Thorne, and C. Misner, *Gravitation*, (San Francisco, (Freeman, p. 1273).
2) Evan H. Walker, "The Nature of Consciousness," Mathematical Biosciences, (7, 1970), pp. 175-176.
3) Niels Bohr, *Atomic Theory and the Description of Nature*, (Cambridge, England: Cambridge University Press, 1934, p. 53).
4) It is only duality in from, but it's the same essence.
5) V. P. Long, T. L. Longman, R. A. Muller, V. S. Poythress, M. Silva, *Foundations of Contemporary Interpretation*, (Grand Rapids, Michigan: Zondervan Publishing House, 1996, p. 455).
6) Niels Bohr, Hans Kramers, John Slater, (BOHR-KRAMERS-SLATER) THEORY: "The Quantum Theory of Radiation." (The London, Edinburgh, and Dublin Philosophical Magazine and Journal of Science, Sixth Series, Vol. 47, pp. 785-802).
7) Werner Heisenberg, *Physics and Philosophy,* (New York: Harper & Row, 1958, p. 41).
8) Stephan Strasser, *The Idea of Dialogal Phenomenology*, (Pittsburgh: Duquesne University Press, 1969, p. 56).
9) David Bohm & Basil J. Hiley, *The Undivided Universe: An Ontological Interpretation of Quantum Theory*, (London: Routledge, 1993, p. 323).
10) *Ibid.*
11) *Ibid.,* p. 325.
12) *Ibid.*
13) There is also the idea, in Alfred Schutz's development of the Husserlian lifeworld, that everyday lifeworld depends on the natural attitude, where the reality of the world is experienced, until further notice, as mere appearances. This is a feature of everyday life.
14) Marlin Donald, *A Mind so Rare: The Evolution of Human Consciousness*, (New York, New York: Norton, 2001, p. 75).
15) These aspects could be the detailed discussions of future papers.