THE SCIENCE OF NONLOCALITY— PERSPECTIVES AND IMPLICATIONS

Muhammad Suheyl Umar

"The Qur'an, which is the basis of both *tariqah* and *shari'ah*, affirms continually the Transcendence of God and also His Immediate Presence, as do the sacred books of all orthodox religion; but because Sufi writers, inasmuch as the *tariqah* is the way of approach to God, tend to dwell especially upon His Immediate Presence, as expressed in His Names the Near, the Hearer, the Seer, it has been concluded by some that Sufism is pantheistic. This conclusion is totally false: as has been said in defence of the Red Indian against the same accusation of pantheism, it may also be said of the Sufi that '***he does not for one moment imagine that God is in the world; but he knows that the world is mysteriously plunged in God***.' "[193]

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"They worship me as One and as many, because they see that all is in me."

Bhagavad-Gita

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"In the depth I saw ingathered, bound by love in one single volume, that which is dispersed in leaves throughout the universe: substances and accidents and their relations, as though fused together in such a way that what I tell is but a simple light."

Dante

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A connectedness unconditioned, which the reason can't fathom
Has the Lord of the mankind with the spirit (or life) of the mankind.

Rumi

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[193] Frithjof Schuon, "Apercus sur la Tradition des Indiens de l'Amerique du Nord", *Etudes Traditionnelles* (Chacornac), 1949, p. 164. See also Titus Burckhardt, *Du Soufisme* (P. Derain, Lyon), pp. 17-20.

"Life blood of a sun gushes forth if the heart of a grain of sand is split."

Muhammad Iqbal

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The idea of interconnectedness of the apparently disconnected phenomenal world, of an "undivided wholeness" is our shared human heritage. This is evident from the few random examples given above that have been selected from diverse sources. The citations could be increased a thousand times since this is, perhaps, the idea, the leitmotif that one most frequently encounters in all the religions and wisdom traditions of mankind. The sole exception is modern science.[194]

I would not attempt to try and look at the scientific side of the question. All I intend to offer here is in the form of general comments that highlight certain important facts that pertain to the issue, which itself is quite old now, and to make some remarks about the implications that the science of Nonlocality carries for scientific thinking and our current worldview.

Modern science[195] has come a long way from its "mechanistic world picture" inherited from the Renaissance and the Scientific Revolution. The journey had been arduous and the terrain treacherous. There were several landmarks during the voyage:[196]

- The Rise of the idea of "Laws of Nature".

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[194] Somewhere, during the course of its historical development, western thought took a sharp turn in another direction. It branched off as a tangent from the collective heritage of all humanity and claimed the autonomy of reason. It chose to follow reason alone, reason unguided by revelation and cut off from the Intellect that was regarded as its transcendent root. See Martin Lings, "Intellect and Reason" in *Ancient Beliefs and Modern Superstitions*, rpt. (Lahore: Suhail Academy, 1988, 57-68); F. Schuon, *Gnosis Divine Wisdom*, London: J. Murray, 1978, 93-99, rpt. (Lahore: Suhail Academy, 2002); S. H. Nasr, "Knowledge and its Desacralization" in *Knowledge and the Sacred* (Edinburgh: Edinburgh University Press, 1981, 1-64, rpt. (Lahore: Suhail Academy, 2000); Huston Smith, *Forgotten Truth* (San Francisco: Harper San Francisco, 1992), 60-95, rpt. (Lahore: Suhail Academy, 1988). Also see his *Beyond the Post-Modern Mind*, Wheaton: Theosophical Publishing House, 1989, rpt. (Lahore: Suhail Academy, 2002).

[195] That is to say the science that developed in the west after the Renaissance.

[196] For details of these intellectual landmarks of modern science see S. H. Nasr, "The Traditional Sciences, the Scientific Revolution, and its Aftermath" in *Religion and the Order of Nature* (Oxford University Press, 1996, Ch. 4, pp. 126-162.

- Copernicus, Copernicanism, and the "Infinite Universe".
- Ideas of Bacon and Gilbert.
- Galileo and the idea of Mathematical Physics.
- Kepler and the Idea of Celestial Physics.
- Descartes, his "Dualism" and the "Mathematization of Space, Time and Matter".
- Newton, *The Principia*, and the "Order in Nature".
- The "Quantification of Nature" in the Eighteenth Century.
- Evolution; Darwinian and Neo-Darwinian.
- Modern Physics: Relativity and Quantum Mechanics.
- Order and Chaos; The Prigoginian View.
- Scientific Positivism and its Critique.

With quantum mechanics the departure[197] of the understanding of order in nature from that of classical physics become more radical, and even the mathematical order that quantum mechanics shares with classical physic is different in that the latter accepts this order only in the statistical sense. Indeterminacy and uncertainty lie at the heart of quantum mechanics, going back to the question of the wave or corpuscular nature of light[198] and including the formal principle of uncertainty stated by Werner Heisenberg.

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[197] Modern physics is at once the reversal of the worldview of classical physics and its continuation. This can be seen particularly in the theory of relativity, which rejects completely the Newtonian concept of space and time and the eighteenth century conception of matter and yet remains faithful to the mathematical view of the order of nature so central to Newtonian thought. Moreover, Einstein continued to consider the order dominating over the Universe as being related to God, who strictly imposed causality over the Universe in which chance "did not play dice" with the Universe. In the same way that Newtonian laws of motion are special cases of relativistic laws of motion, Einsteinian relativity shares the basic conception of the order of nature with classical physics as far as relating order to mathematical patterns is concerned.

[198] The debate as to whether light is a wave or a stream of corpuscles goes back to Newton and Christian Huygens, each of whom had their defenders in the eighteenth and nineteenth centuries, Newton's view being supported by such figures as Ruggiero Boscovich and Pierre Simon de Laplace and Huygens by Robert Hooke and Thomas Young. These views remained, however, exclusive of each other and did not become accepted at the same time within a single view of physics.

The major differences between the two are to be seen, first, in the notion of matter, which becomes convertible to energy in modern physics, while being "neither created not destroyed" in classical physics and chemistry, and second, in the transfer of absoluteness from space and time in Newtonian physics to the velocity of light in relativity. The vision of the Universe issuing from the two schools of physics is different, yet the idea of mathematical order permeating the two visions of the natural world is the same.

In quantum mechanics, however, the two views become combined in such a way as to be logically and even imaginably difficult to conceive. On the one hand Max Planck discovered the discontinuous emission of energy, and Einstein proposed the theory of photons or particles of light, called also "quanta of action," which were discovered by Arthur H. Compton and Chandrasekhar V. Raman, all leading to the theory of the granular nature of light. On the other hand the de Broglie-Schrodinger theory led to the view that matter and light had wavelike structure. This led to the "wave-particle" duality, which was seen by the physicists of the day and continues to be viewed by most physicists as being irreducible to a single reality.[199]

There are, however, other interpretations of this "ambiguity" as well as other main features of quantum mechanics: These include Paul Dirace's assertion that we can only know a defined state partially; Heisenberg's uncertainty principle, which involves the very concept of our understanding of nature; the denial of local causality; all laws of quantum mechanics being probabilistic; and the denial of classical determinism.[200]

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[199] The result of this discovery of quantum mechanics led to the Copenhagen School, which argues that no picture of reality is possible and that micro nature is bipartite in an ultimate way, with the result that the nexus between physics and what philosophical understanding of nature it might possess has thus become severed, at least for those who accept the interpretation of this school.

[200] On the major features of quantum mechanics and its worldview see Paul A. M. Dirac, *The Principles of Quantum Mechanics* (New York and Oxford: Oxford University Press, 1947); Leonard Schiff, *Quantum Mechanics* (New York: McGraw-Hill, 1955); Henry Margenau, *The Nature of Physical Reality* (New York: McGraw-Hill, 1950); Victor Weiskopf, *Physics in the Twentieth Century* (Cambridge, Mass.: M.I.T. Press, 1972); Johnvon Neumann, *The Mathematical Foundations of Quantum Mechanics*, trans. R. Beyer (Princeton, N.J.: Princeton University Press, 1955); Max Jammer, *The Philosophy of Quantum Mechanics* (New York: Wiley, 1974); David Bohm and Basil Hiley, *The Undivided Universe: An Ontological Interpretation of*

Modern physics also presents a radically different view of the subatomic world from the simple atomism of classical physics, which considered nature to be comprised of indivisible particles— that is, atoms (from *atomos*, meaning literally "indivisible" in Greek). At the beginning of the twentieth century physicists looked for "ultimate" building particles of matter, and many continue to do so today. But as more and more particles came to be discovered in addition to protons, electrons, and neutrons there now exists such an array of particles, called by some physicists "a particle zoo," that many have given up on the idea of finding the "ultimate' particles or building blocks of matter, and rather envisage a vast ocean of energy from which different particles with various lifetimes issue forth and into which they disappear.[201] One might say that whereas Newtonian physics saw an order underlying what appears outwardly as chaos in the perceptible world, for quantum mechanics there is chaos or at least an unknowable reality underlying the order of macro and even micro nature. Some have concluded from this that the limits of human knowledge in the understanding of nature have been reached beyond which one can only appeal to wisdom and other modes of cognition; others, needless to say, reject any other possible mode of knowing. Whatever the case, it is here that metaphysical and religious modes of knowledge concerning even the natural world are entering into the intellectual world of at least some physicists for the first time since the Scientific Revolution, even if until now most physicists who have turned to those other modes of knowledge (usually drawn from non-Western sources) have not been able to gain a profound grasp of those alternative modes of understanding the nature of reality.

Perhaps the greatest challenge to the modern scientific understanding of order comes from the consequences of the Bell theorem, which implies a fundamental interconnectedness of the parts of the Universe denied by both classical and modern physics until only recently.[202] (John Stuart) Bell's

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Quantum Theory (London: Routledge, 1993); and the more popular work of Gary Zukav, *The Dancing Wu Li Master: An Overview of the New Physics* (New York and London: Bantam Books, 1984).

[201] "The world of particle physics is a world of sparkling energy forever dancing with itself in the form of its particles as they twinkle in and out of existence, collide, transmute and disappear again." Zukav, *Dancing Wu Li*, p. 194.

[202] Henry Stapp call Bell's theorem "the most profound discovery of science." See Stapp. "Bell's Theorem and World Process," in *Il Nuovo Cimento* (Vol. 29B, 1975), p. 271.

theorem asserts that if quantum mechanics is correct then the principle of local causes and the whole notion of locality as we understand it is false. And because it has been shown that the predictions based upon quantum mechanic calculations correspond to experimental results, the whole idea of local causality must be false. The theorem itself is based on the remarkable behaviour of particles in two different points in space in which the change of the state of one is detected *immediately* in the other without an apparent causal nexus between them, leading some physicists to speak of the transfer of information at superluminal speeds, something that Einstein rejected.[203]

One of the most notable interpretations of the consequences of Bell's theorem is that of David Bohm, who speaks of the unbroken wholeness of physical reality and denies one of the basic tenets of classical physics, which is the divisibility and analyzability of the physical world. Rather than the world being composed of separate objects in an "explicate order," it is, according to Bohm, an *implicate order* [204] or an unbroken wholeness, about which one can only say that it is. "There is an order unfolded into the very process of the universe but that unfolded [or implicate] order may not be readily apparent."[205] Particles appear to be discontiguous in the explicate order, but they are in reality contiguous in that implicate order which our ordinary consciousness does not perceive. Matter itself is a form of the implicate order, and in contrast to what we perceive through our segmented consciousness it cannot be reduced to particles. If only we were to acquire the light consciousness which could know the whole or that-which-is, one would see the separate elements related to the implicate order as the implicate order.

In this interpretation of quantum mechanics and especially Bell's theorem, not only is there an insistence upon wholeness as coming before all parts and segments, but also an insistence upon the significance of consciousness for

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[203] Bell's Theorem has many metaphysical and philosophical implications, some of which have been examined by a number of philosophers and scientists. See especially Wolfgang Smith, "Bell's Theorem and the Perennial Ontology" in *Sophia*, *A Journal of Traditional Studies*, The Foundation for Traditional Studies, Oakton, VA, Vol. 3, No. 1, Summer, 1997, pp. 19-40.

[204] See David Bohm, *Wholeness and the Implicate Order* (Boston: Routledge and Kegan Paul, 1980).

[205] Zukav, *Dancing Wu Li*, p. 306.

the mode in which we perceive nature,[206] and the necessity to have a transformation of consciousness in order to perceive that whole in whose matrix alone the behaviour of the "parts" can be understood. Obviously, there are implication that such a view carries for the religious understanding of the order of nature and the reassertion of the significance and validity of its view. But it needs to be added here that the views of Bohm have not gained the adherence of every physicist, although many have been attracted to it. The prevalent attitude remains that of the Copenhagen School and the identification of the order of nature with laws determined by statistical probabilities and by mathematical models using statistical methods.

Here and there one sees attempts to reassert a view of the order of nature based on the wholeness of nature as a living being determining its parts in not only biology but also physics,[207] and one must recall the famous assertion of Lewis Thomas that the entire Earth is a cell.[208] Still, it is not as yet realized widely enough that traditionally the principles and conception of science employed in natural philosophy did not originate from the sciences themselves but from metaphysics as implied by the Greek notion of *epistēmē*,[209] whereas in contrast, ever since the seventeenth century, the theory of the sciences came to be based on the sciences themselves in an *a posteriori* and not an *a priori* manner. A new philosophy of nature was thus developed that was based on the sciences of nature and thereby divorced from metaphysical principles, which in all traditional climates had provided the

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[206] Of course, ever since the pioneering work of Eugene Wigner in quantum mechanics, consciousness has been considered as an important element of physics by many physicists in contrast to the view of classical physics whose description of the mathematical order of the universe is considered to be completely independent of the mode of consciousness of the person who perceived that order or of consciousness itself.

[207] E. E. Harris writes that the whole cosmos is a "single, individual totality, organistic throughout." George F. McClean (ed.), *Man and Nature* (Calcutta: Oxford University Press, 1978), p. 30, adding that according to this view *Totum in toto et totum in qualibet parte*.

[208] See *The Lives of a Cell* (New York: Viking Press, 1974), p. 5.

[209] The concept of science outlined by Aristotle in his *Posterior Analytics* was certainly not based on his biology or physics. See Ernan McMullin, "Concepts of Science in the Scientific Revolution," in David Lindberg and Robert Westman (eds.), *Reappraisals of the Scientific Revolution* (Cambridge and New York: Cambridge University Press, 1990), p. 28.

common principles and ground for discourse between the religious and scientific understanding of nature.[210]

Through all the important transformations in modern science from Newtonian mechanics to Bohm's implicate order, it is the scientific understanding of the order of nature that continues to dominate the contemporary scene so as to make a dialogue with the authentically religious view of nature difficult if not well nigh impossible. Even those interested in such a dialogue tend to equate the dogmatism of purely manmade science with sacred doctrines of a Divine Origin, asking both sides to put aside their "dogmatism" to bring about mutual understanding.[211] And then there are those scientists who think they can reach the sacred and metaphysical truth contained in the heart of religions by analyzing to an even greater degree the complex structures of the material world as if one could ever cast aside the veil of Isis.[212] The truth remains that no matter how much it changes, modern science cannot but deal with phenomena, whereas the religious understanding of the order of nature is based ultimately upon knowledge of the ontological reality and root of things in the Divine and the significance of their form and qualitative characteristics on the phenomenal plane as reflecting noumenal realities belonging to the Divine Order. No serious dialogue is possible unless the empirical or scientific view of the order of nature is forced to abdicate from its absolutistic domination over the contemporary dominion of knowledge and the religious understanding of the order of nature comes to be taken seriously in all its depth and grandeur and not as the pale shadow of its real self as it has become during its period of retreat and dilution in the past few centuries in the West.

But the events that have taken place in recent years indicate that the situation has started to change. It is starting to look as if physics is out of its

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[210] For the necessity of any veritable science to be rooted in metaphysical principles in the authentic and traditional sense of metaphysics, see Fernand Brunner, *Science et realité* (Paris: Aubier, 1954).

[211] An example of such an approach is to be found in the recent work of Brian Swimme and Thomas Berry, *The Universe Story* (San Francisco: Harper, 1992), which despite its good intentions does not distinguish between doctrines of a sacred character and mental crystallisations that have paraded as scientific dogmas as if the Holy Ghost and the mathematical or physical inspiration of a scientist are on the same level.

[212] See Frithjof Schuon, *Roots of the Human Condition* (Bloomington, Ind.: World Wisdom Books, 1991), "The Veil of Isis," pp. 15ff.

"tunnel vision" already. We can say that on the authority of the EPR (Einstein-Podolsky-Rosen) experiment, which establishes that the universe if nonlocal. Separated parts of it— how widely they are separated makes no difference; it could be from here to the rim of the universe— are simultaneously in touch with one another. In lay language— the only one available to me, anyway— what the EPR experiment demonstrates is that if you separate two interacting particles and give one of them a downspin, instantly the other will spin upward.

The theoretical consequences of this finding are revolutionary— sufficiently so for Henry Stapp of the University of California, Berkeley, to call it "the most important finding of science, ever," for it relegates space, time, and matter (the matrices of the world we normally know) to provisional status. If we were to look out upon the world through a window with (say) nine panes of glass set in place by latticework, we would *see* the outdoors as divided by the latticework (which of course is not in the landscape we are looking at). Something like that pertains here.

What are the implications of all this? Let us take a look.

Everything we perceive with our senses (and analyse and classify into laws and relationships) has to do with the relative world, a kind of phantom play of names and forces flowing temporally in the stream of space and time. In this relative world there are no absolutes; time and change govern everything. Nowhere are there fixed frames of reference, nowhere objects. No event can be perceived in exactly the same way by all observers, and there is an irreducible uncertainty that precludes the possibility of our ever knowing all the fundamental properties of the phenomena that we experience and investigate. This uncertainty is built into the very fabric of the universe, so nothing escapes it. The whole cannot be reduced to a set of basic building blocks, for on the cosmic scale matter can disappear into pure energy and reappear in a different guise. The ancients would not have been surprised. *Anicca, anicca*; impermanence, impermanence.

But that is only half the picture. What puts post-EPR physics all but outside the truncated vision of the classical physics can now be stated explicitly. The moment of truth in the EPR experiment opens a rift in the cloud of unknowing through which physicists catch sight of another world, or at least another reality. "Everything we [now] know about Nature is in

accord with the idea that the fundamental process of Nature lies outside space-time, but generates events that can be located in space-time." We have not mentioned matter, but the phrase space-time implies it, for physics locks the three together. And in the words of Geoffrey Chew, "If you begin with matter as a given, you're lost."

One should not be quick to jump, like the New Age enthusiasts, to the conclusion that physicists have discovered God, which of course is not the case. All physicists have found is that what runs the show (runs the spatio-temporal-material universe) lies outside that show. Still, in establishing the existence of "something," if only a not-further-characterised X, beyond the spatio-temporal-material world, nonlocality provides us with the first level platform since modern science arose on which scientists and theologians can continue their discussions. For God too resides outside those three perimeters.

We may say a few words about Intelligent Design here though in the end one should not bank on it. More and more, scientists are finding that if the mathematical ratios in nature had been the slightest bit different, life could not have evolved. Were the force of gravity the tiniest bit stronger, all stars would be blue giants, while if it were slightly weaker, all would be red dwarfs, neither of which come close to being habitable. Or again, had the earth spun in an orbit 5 percent closer to the sun, it would have experienced a runaway greenhouse effect, creating unbearable surface temperatures and evaporating the oceans; while on the other hand, if it had been positioned just 1 percent farther out, it would have experienced runaway glaciations that locked earth's water into permanent ice. On and on. We get the point.[213]

I am not myself a scientist, but I naturally favour the design hypothesis. At sea with numbers higher than "the ten thousand things" (the archaic

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[213] Physicists of the stature of John Polkinghorne find it impossible to believe that such fine-tuning (and the apparent frequency with which it occurs) could have resulted from chance. They toss around improbability figures in the range of one in ten followed by forty zeros. For them, improbabilities of this order all but require us to think that the universe was designed to make human life possible, to which they add that design implies an intelligent, intentional designer. They do not laugh when a fellow scientist, intentional designer. They do not laugh when a fellow scientist, Dale Kohler, writes, "we have been scraping away at physical reality all these centuries, and now the layer of the remaining little that we don't understand is so thin that God's face is staring right out at us."

Chinese phrase for heaven and earth, the universe), ten followed by forty zeros completely escapes me. Still, a single fact can carry me to the conclusion the ratios I cited suggest. If the Andromeda Galaxy were not there, neither would we be we are, quite literally, made of stardust. This is quite enough to blast me into a moment of mystical frisson.

The problem, however, with citing a must-have-been-designed universe as an added indication that physics is out of the tunnel is that an equal number of qualified physicists— Stephen Hawking, for one— disagree with this reading of the matter. Whether the disagreement turns on evidence or on the philosophical lens through which the evidence is viewed it itself at the heart of the controversy. Because the evidence is beyond my competence to weigh, any call I made in the dispute would reflect nothing more than my own beliefs and perceptions and thus would count for nothing. It is a good sign that the issue is being vigorously discussed, and no one can fault believers for finding in Intelligent Design a resource for their faith. But that is the most that can be said at this point in the dispute.

Going back to nonlocality, one must admit that physicists disagree over its implications too. Quantum physics or what has been termed the "quantum reality" is an enigma that has tantalised physicists, philosophers, and an ever-widening public for decades. The pertinent literature is vast, and it would appear that just about every conceivable avenue of approach to the problem— no matter how seemingly farfetched— has been advocated somewhere and explored. Gone are the days when the authority of physics could be invoked in support of a single established world-view! What has happened is that the pre-quantum scientistic world-view (now termed "classical") has come to be disavowed "at the top": by physicists capable of grasping the implications of quantum theory. And this in turn has called forth an abundance of conjectured alternatives, competing with one an other, as it were, to fill the ontological void— a situation that has prompted one recent author to speak of a "reality market place." Quantum mechanics, if you will, is a scientific theory in search of a *Weltanschauung*. The search has been on since 1927.

Meanwhile the spectacle of a dozen top-ranking scientists promoting twelve different world-views is hardly reassuring; and there is the temptation to conclude that truth is unattainable, or, worse still, that it is relative, a matter simply of personal opinion.

What is called for, however, is a closer look at the foundations of scientific thought: at the hidden assumptions that have conditioned our contemporary intellectual perceptions. A modest probe into matters generally ignored suffices to reveal a startling fact: it happens that every quantum-reality position thus far enunciated hinges upon one and the same ontological presupposition, a tenet which moreover derives from the philosophical speculations of Galileo and Descartes, and which, surprisingly enough, has been sharply and cogently attacked by some of the most eminent philosophers of the twentieth century. It may indeed seem strange that an ontological assumption that has thus become suspect, to say the least, should have remained unchallenged throughout the length and breadth of the quantum reality debate; but one must remember that the notion of which we speak has become ingrained in the scientific mentality to the point where it can hardly be recognised as a presupposition, let alone as a spurious premise that must go.

Remove this error, expose this virtually ubiquitous assumption as the fallacy it is, and the pieces of the quantum puzzle begin to fall into place. The very features of quantum theory, in fact, which, prior to this ontological rectification had seemed the most incomprehensible, prove now to be the most enlightening. As might be surmised, these features bear witness, on a technical level, to an ontological fact, a truth which had hitherto been obscured.

This done, we shall be in a position to reflect anew upon the salient findings of quantum theory, to see whether these strange and puzzling facts can at last be understood. At the top of the list of "strange facts" that demand an explanation stands the phenomenon of state vector collapse, which could well be termed the central enigma of quantum physics. It poses a fundamental problem that cannot be ignored or by- passed if one would understand the nature of the physical universe, and its relation to whatever other ontological planes there be.

Considerations of this kind do not alter the fact that quantum mechanics is beyond doubt the most accurate, the most universal, as well as the most sophisticated scientific theory ever advanced by man. In a thousand hair-splitting experiments it has never yet been proved wrong. But quantum theory does more than answer a multitude of questions: it also raises a few of its own. And whereas classical physics, which by comparison is both crude

and inaccurate, generally inspires dreams of omniscience, the new physics counsels caution and a becoming sobriety. This reminds us of the article written by John Bell that was published in 1990, one month before his death. Bell wrote, "Suppose that quantum mechanics were found to resist *precise* formulation. Suppose that when formulation beyond FAPP (For All Practical Purposes) is attempted, we find an unmoving finger obstinately pointing outside the subject, to the mind of the observer, to the Hindu scripture, to God or even only Gravitation? Would not that be very, very interesting?"[214] To this we can add the comment made by Antoine Suarez, "Quantum correlations are found to resist precise formulations in terms of time ordered causality. In our experiment we find an unmoveable finger obstinately pointing outside time. What does this most interesting fact imply for the character of the physical reality?"[215]

Where does this unmoveable finger obstinately point to outside time? This is a complex issue that defies neat solutions. Even to attempt a tentative answer would require a rare combination of a scientist and a well trained but undaunted theologian who would not succumb to the pull of comparisons that invariably exerts itself on theologians, drawing them into offering apologetics equating eternal immutable data with shifting theories of science. I would present here one such answer which comes from the famous authority on quantum physics, Wolfgang Smith.

> The upshot is this: It is indeed possible to conceive of a quantum particle as an ordinary object in space, but only on condition that it be linked to a pilot wave which in a way transcends the bounds of space and time. The pilot wave, thus, does not, strictly speaking, exist in space-time; and yet it is supposedly an actual wave in contrast to a mere "wave function" as conceived in the standard theory. But this implies (from a traditional ontological point of view) that this pilot wave is situated precisely on the intermediary plane.[216]

The question remains, of course, whether quantum particles as conceived

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[214] John Bell, *Physics World*, August 1990, Volume 3 No 8, p. 33.

[215] Antoine Suarez, "Quantum Correlations and the Burning Bush" unpublished paper.

[216] For a detailed exposition of the concept of multiple levels of being, couched in a terminology appropriate for the consumption of lay people and scientists alike, see Huston Smith, *Forgotten Truth*, Suhail Academy, 1988.

by de Broglie and Bohm do in fact exist. Inasmuch as opposite answers to this question have been given by two empirically equivalent versions of quantum theory, it is clear, moreover, that the matter cannot be resolved by the methods of physics. What has, however, been rigorously proved is this: if a quantum particle exists as an ordinary object in space, there must then also exist a corresponding entity which by virtue of its non-locality belongs to the intermediary domain.

This result, I say, is of immense significance. It amounts to a recognition, on the strength of modern physics, of an ancient ontological truth: the Hermetic fact, if you will, that whatsoever exists on the corporeal plane must pre-exist on the intermediary, and indeed, on every higher ontological level. One knows today that not even an ordinary particle can stand alone, but must be accompanied by a "subtle" presence that transcends the accustomed spatio-temporal bounds, a presence which consequently strikes us as mysterious and indeed preternatural: this quantum theoretic fact, I say, has now received its ontological interpretation. What it signifies is that the corporeal world does not exist apart from higher ontological planes. What actually exists is the integral cosmos, which consists, to say it once more, of a spiritual centre, a corporeal periphery, and a subtle intermediary domain: neither "heaven" alone nor "earth" alone, but "heaven and earth" as the opening verse of Genesis declares.

Huston Smith once remarked that the modern West is the first society to view the corporeal world as a closed system; that error has now been corrected. It has been rectified by the most accurate branch of modern science: by quantum physics, which in light of the preceding considerations has to do with "border phenomena," that is to say, phenomena which betoken the proximity of a trans-corporeal plane. In the standard version of quantum theory, it is the physical plane that enters the picture, and in the de Broglie Bohm version, it is the intermediary.[217]

Mention was made earlier of a transformation of consciousness in order to perceive that whole in whose matrix alone the behaviour of the "parts" can be understood. In this connection mention may also be made of the

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[217] Wolfgang Smith, "Bell's theorem-Perennial Ontology", *Sophia*, *Journal of the Foundation for Traditional Studies*, Vol. 3, No. 1, Summer 1997.

findings made about the subjective pole of existence. Here I would let Huston Smith say it. The quote comes from his *Cleansing the Doors of Perception*[218] where he has reported the recent researches of Stanley von Grof. The picture that emerges looks like this:

> The ultimate source of existence is the Void, the supracosmic Silence, the uncreated and absolutely ineffable Supreme.
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> The first possible formulation of this source is Universal Mind. Here, too, words fail, for Universal Mind transcends the dichotomies, polarities, and paradoxes that harass the relative world and our finite minds comprehension of it. Insofar as description is attempted, the Vedantic ternary—Infinite Existence, Infinite Intelligence, Infinite Bliss — is as serviceable as any.
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> God is not limited to his forgoing, "abstract" modes. He can be encountered concretely, as the God of the Old and New Testaments, Buddha, Shiva, or in other modes. These modes do not, however, wear the mantle of ultimacy or provide final answers.
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> The phenomenal worlds owe their existence to Universal Mind, which Mind does not itself become implicated in their categories. Man, together with the three-dimensional world he experiences, is but one of innumerable modes through which Mind experiences itself. The heavy physicality and seemingly objective finality of man's material world, its space-time grid and the laws of nature that offer themselves as if they were the *sina qua nons* of existence itself—all these are in fact highly provisional and relative. Under exceptional circumstances, people can rise to a level of consciousness at which they see that taken together they constitute but one of innumerable sets of limiting constructs that Universal Mind assumes. To saddle that Mind itself with those constructs would be as ridiculous as trying to understand the human mind through the rules of chess.
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> Created entities tend progressively to lose contact with their original source and the awareness of their pristine identity with it. In the initial stage of this falling away, those entities maintain contact with their source, and the separation is playful, relative, and obviously tentative. An image

[218] Huston Smith, *Cleansing the Doors of Perception,* Penguin Putnam, New York, 2002, p. 94-97.

that illustrates this stage is that of a wave of the ocean. From a certain point of view the wave is a distinct entity—we can speak of it as large, fast-moving, green, and foamy. But its individuation doesn't keep it from belonging to the ocean proper.

At the next stage, created entities assume a partial independence and we can observe the beginnings of cosmic screen work, the Absolute's assumption of veils that are gossamer-like in the beginning but grow increasingly opaque. Here unity with the source can be temporarily forgotten in the way an actor can forget his own identity as he identifies with the character he depicts.

Eventually the veiling process reaches a point where individuation looks like the normal state of things and the original wholeness is perceived only intuitively and sporadically. This can be likened to the relationship between cells of a body and the body as a while. Cells are separate entities but function as their body's parts. Individuation and participation are dialectically combined. Complex biochemical interactions bridge provisional boundaries to ensure the functioning of the organism as a whole.

In the final stage, the separation is practically complete. Liaison with the source is lost sight of and the original identity forgotten. The screen is now all but impermeable, and a radical change of consciousness is required to break through it. A snowflake can serve as a symbol. In outward appearance it doesn't look like water; to understand that nevertheless it is water we have to get down to H2O.

Human beings who manage to effect the requisite break through find thereafter that life's polarities paradoxically do and do not exist. This holds for such contraries as matter and spirit, good and evil, permanence and change, heaven and hell, beauty and ugliness, and agony and ecstasy. In the end, there is no difference between subject and object, observer and observed experiencer and experienced, creator and creation.

In the early years of psychoanalysis when hostility was shown to its theories on account of their astonishing novelty and they were dismissed as products of their authors perverted imaginations, Freud used to hold up against this objection the argument that no human brain could have invented such facts and connections had they not been persistently forced

on it by a series of converging and interlocking observation. Grof might argue in the same way: to wit, that the cosmology and ontology that his patients came up with is as un-inventable as Freud's own system. Actually, however, he does not do so. In the manner of a good phenomenologist, he lets the evidence speak for itself, neither undermining it by referring it back to causes which (in purporting to explain it) would explain it away nor arguing that it is true. As phenomenologists themselves would say, he "brackets" his own judgement regarding the truth question and contents himself with summarising what his patients said.

The idea that the "three-dimensional world" is only one of many experiential worlds created by the Universal Mind appeared to them much more logical than the opposite alternative that is so frequently taken for granted, namely, that the material world has objective reality of its own and that the human consciousness and the concept of God are merely products of highly organized matter, the human brain. When closely analyzed the latter concept presents at least as many incongruities, paradoxes and absurdities as the concept of the Universal Mind. Problems such as the finitude versus infinity of time and space; the enigma of the origin of matter, energy and space; and the mystery of the prime impulse appear to be so overwhelming and defeating that one seriously questions why this approach should be given priority in our things."

In the end it may also be recalled that beyond the diverse cosmologies and understandings of the order of nature in various traditional religions there stands, as already mentioned, a religious view of the cosmos that reveals remarkable universality if one goes beyond the world of forms and the external to seek the inner meaning of myths and symbols in different religious universes. First, it needs to be remembered that a religion not only addresses a human collectivity; it also creates a cosmic ambience, a sector of the Universe that shares in the religious realities in question.

According to the metaphysical teachings of various traditions and the cosmologies which are their applications to the cosmic sector, the Divine Principle is not only the Origin of the cosmos but also the Source of the religion that links humanity to both the Divine Principle and the order of nature. Some religious traditions such as Confucianism, Taoism, and Buddhism do not concern themselves with the creative and generating function of the Divine Principle as do the Abrahamic monotheisms and

Hinduism. But in both types of faith, there is the Supreme Principle that is the Origin of both man and the cosmos, even if "Origin" is not understood in a cosmogonic sense in some cases. More particularly, each religion is the manifestation of a Divine Word, a Logos, or demiurgic principle that, within the religious cosmos created by a particular revelation or "heavenly dispensation," is the direct source of the religion in question as well as the immediate "ruler" of the cosmos within which that religion functions.

Finally, every being in the world of nature not only issues from the Divine Principle or the One, but also reflects Its Wisdom and, to use theistic language, sings the praises of the Lord. The religious understanding of the order of nature, which we can share only on the condition of conforming ourselves to the world of the Spirit, enables us to read the signatures of God upon the face of things and heart their prayers. It thereby re-creates a link between us and the world of nature that involves not only our bodies and psyches but also the Spirit within us and our final end. It enables us to see the sacred in nature and therefore to treat it not only with respect but also as part of our greater self. It reminds us how precious each being created by God is and how great a sin to destroy wantonly any creature that by virtue of its existence bears the imprint of the Divine and is witness to the One who is our Origin and End.

But the Promethean minds believe themselves to be creatures of chance moving freely in a vacuum and capable of "self-creation", all within the framework of an existence devoid of meaning; the world, so it seems, is absurd, but no notice is taken—and this is typical—of the absurdity of admitting the appearance within an absurd world of a being regarded as capable of remarking that absurdity. Modern man is fundamentally ignorant of what the most childish of catechisms reveals, doubtless in a language that is pictorial and sentimental, yet adequate for its purpose; namely, that we are inwardly connected with a Substance which is Being, Consciousness, and Life, and of which we are contingent and transitory modalities. He is consequently unaware of being involved in a titanic drama in terms of which this world, seemingly so solid, is as tenuous as a spider's web. Existence, invisible and underlying, is concrete, not abstract; it "sleeps" and "awakes", it "breathes" and can make worlds collapse; space, time, and man are no more than minute fragments of a Being and a Movement which escapes all our measurements and all that we can imagine. The divine Substance, however,

cannot have the limiting properties of matter, nor those of an animic fluid. Its homogeneity implies a transcending discontinuity the traces of which are indeed apparent around us and within us (the body is not life and life is not intelligence), but which we can not grasp adequately with the help of our terrestrial categories alone.

The great misconception, then, is to believe that the basis of our existence is space and that the factors which make up our individual destinies are contained in it, whereas in reality this basis—at one and the same time immutable and in movement according to the relationship envisaged—is situated in a "supra-space" which we can perceive only through the heart intellect and about which those explosions of total Consciousness, the Revelations, speak to us symbolically. The error is to believe that the causes which determine human history or which carry it to its conclusion belong to the same order as our matter or as "natural laws", whereas in fact the whole visible cosmos is resting upon an invisible volcano—and also, at a deeper ontological level, upon a formless ocean of bliss. Men imagine that this earth, these mountains, or bodies can only be destroyed by forces on their own level, by masses or energies belonging to our physical universe. What they do not see, however, is that this world, in appearance so compact, can collapse *ab intra*, that matter can flow back "inward" by a process of transmutation, and that the whole of space can shrink like a balloon emptied of air; in short, that fragility and impermanence not only affect things within a space naively supposed to be stable, they also affect existence itself with all its categories. Our nature consists precisely in the ability to escape, in our inner-most core and in the "unchanging Center", from the break-up of a macrocosm that has become over solidified, and to become reintegrated in the Immutable whence we came forth. What proves this possibility is our capacity to conceive this Immutability; it is also proved, in a concordant manner, by the fact (at once unique and multiple) of Revelation.