

Realizing Social Unity in Africa: Insight from Three (3) Relational Models in Quantum Physics

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Abstract

The paper examines three (3) Relational Models in Quantum Physics. It notes that there exists in quantum reality an intercultural supposition of a 'deep and shared understanding' that can birth a new metaphysics and model for social relation in a multi-cultural nation state. The paper consider and reject the postures of Postmodernism as destructive. It discusses how postmodernist tendencies impact social relation, and show why the discourse of social relation can best situate in Quantum Physics and not Classical Physics and Postmodernism. The supposition is that (unlike in Classical Physics and even Postmodernism), Quantum bits possesses the capacity to relate internally. This is encouraged as such as its concern is the sort of laws which governs collection of events. It concludes by encouraging a wider sense of self-awareness as to recognize and explore such quantum structures latent in the human person for social unity.

Keywords: Relationality, Quantum Physics, Model, Postmodernism, Social Unity

Introduction

In Africa today, for many reasons, everyone, as a matter of fact, perceives every other person as the other and a threat of some sort. This has engendered and strengthened behaviours antithetical to efforts toward genuine social relations, and social unity. In many ways, it resonates typical signs of the influence of postmodernist thoughts such as disintegration, deconstruction, decenterment, displacement, difference, discontinuity, and disjunction to mention a few as echoed by Lyotard Francois, Jacque Derrida, Michel Foucault, and Rorty Richard. Our existential situation, for instance, how we live and what choices, decisions, and actions we take [all] point to it. That this has impressed on us major concerns is not in doubt. This paper discusses how these postmodernist tendencies impact social relation and show why the discourse of social unity can best situate in Quantum Physics and not Classical Physics and Postmodernism. It explores the nature and workings of three (3) insights in Quantum Physics: Both/and thinking, Indeterminacy, and the idea of Wave/Particle duality as models with which meaning can be restored in our social space. What we want to advocate here is called 'positive revolution', and its weapons are but simple human perception and values. For it to work, one thing of course is crucial: something we all share as human beings. In the

principle and dynamics of quantum, reality lies such 'deep and shared understanding' – what, from which we can build a new metaphysics and model for social relation.

Quantum Physics and Related Domains: A Clarification

Quantum discourses pertain to the nature of reality and the correlation thereto. To better understand quantum physics considering its centrality to this discourse, it would be pertinent to make clear a few terms that are easily muddled up. Although quite a number of scholars tend to use quantum physics, quantum theory, quantum mechanics, and even quantum science interchangeably, contextually they are not actually one and the same. On a general note, what they share is simply the "quantumness". The word 'quantum' (plural, *quanta*) supposes a quantity of something, a specific amount [1]. The origin and usage of the 'coinage' stretch back to the event in 1900 that marked the scientific departure from Newtonian physics. Until the period in question, the Newtonian paradigm and the crop of scientists within it had problems accounting for some phenomena such as those in the subatomic realm. It could only explain macroscopic phenomena very well [2]. This limitation of classical physics created the need for a revolution in thinking that became known as quantum physics [3]. And with it comes the supposition that certain physical quantities

can only assume discreet values. Quantum theory – its purports introduced by Planck (1858-1947) – an effort one would describe saved physics from coming to an end, emerged from such understanding. This discovery and what promise it held were considered profound. Thus the trenchant concept of quantum entered physical science most overwhelmingly. As it is the task in this section, we will do well to clear the blurry ground and to state clearly what each of the aforementioned terms is engaged with even though in many ways one dovetails, inform, or derive from the other.

In simple and clear terms, quantum theory is the theory – the emergence which guaranteed the continued existence of Physics as a discipline. It is what kick-started what we call quantum physics today. As a theory, it projects the view that nature comes in bits and pieces (quanta) [4]. Mechanics, on the other hand, in physics deals with the study of motion. If one adds the prefix ‘quantum’ to it, that is, “Quantum mechanics”, it means it is a sort of study of the motion of quantity. To put it in a way typical of the discourse, Quantum mechanics is a branch of physics that studies the phenomenon of “quantum theory” – the stipulation that reality comes in quantity. Of note, it is a study more of the mathematical core of quantum theory [5]. This is all different from “quantum science” which is rather its practical engagement (that is, the experimental investigation or direct inquiry of the quanta).

The hypothesis of quanta unlike it was the case in classical physics floated an otherwise idea that there are changes in nature that do not occur continuously but in an explosive manner [6]. Classical physics considered that radiation oozed continuously in and out of the black body, much as water might ooze in and out of a sponge [7]. In the smooth changing and working world of classical physics, this supposition, in every sense, seemed to them plausible and to that extent correct. It was Planck that dared it with the contrary proposal: that it is rather a punctuated process in which the energy is emitted or absorbed as quanta [8]. From this point onward the philosophy and paradigms of physics were never to be the same. With its knowledge, a whole lot of other issues were taken up and as well applied successfully to different physical problems. Such other physicist we would see make their mark within the period are Albert Einstein (1879-1955), Niel Bohr (1885-1962), Louis De Broglie (1892-1987), and Erwin Schrodinger (1887-1961), Heisenberg Werner (1901-1976). Their very important theories, in that order, that make the richness – of what quantum physics represents today are the general theory of relativity, photoelectric effect, the principle of complementarity, wave/particle duality, Schrodinger’s cat experiment, and the uncertainty principle.

Having clarified the troubling terms, it is also important to spell out why it is quantum physics and not quantum mechanics or the others that this work finds relevant. What is so special about it and to this entire discourse? Undoubtedly, the very nature of things is such that, at some point, we must choose which aspect of them we wish to know best [9]. Our interest here is one of locating ‘quantum reality’ – what we think to embody a specifically quantum kind of unity that can provide a physical basis for unified consciousness and that might as well bear on our quest for a more

unified structure. There is nothing of the sort that can be found in the old physics. It may pretend to offer an example of systems that have a degree of unity but centrally lacking in the systems are the basic structures with which it can happen.

Thus, like the basic skeptical attitude and self-seeking tendencies of postmodernism that favors separation and fragmentation; the constituent particles of classical physics are as well always inherently separate [10]. Quantum mechanics, in particular, is so different in that it depicts only probabilities and intentionally leaves vague the relation between group behavior and the individual. The sort of internal overlap and genuine social unity we sought can only be gotten in quantum ‘bits’ with the capacity somehow to “get inside each other, or relate internally”. Only quantum physics can provide this, in that, its concern is the sort of laws that governs collections of events [11].

Apart from such characteristics of quantum, Physics on its own as a discipline is not some separate and remote field of learning. It is as much into human mind discourse – “a product of the evolution of human consciousness”. We have a strong resolve that there is an element of physics in all things and that it is spread out amongst things; it is possible, at least in principle to arrive someday at a genuine physics of society. This is what we are out in search of – a society with ‘commonness’ of pursuits. One in which the knowledge of our interconnectedness will enable an ‘opening-up’ of a final state of unification where not just individuals but many cultural traditions may live together and may combine different human endeavors into a new kind of balance between thought and deeds, between activity and meditation [12]. Such is what we think the knowledge of ‘quantum reality can offer us if we can locate its basic element, and as much allow it to guide our thoughts and actions.

Quantum Reality: Nature and Workings

Considering, as we have elsewhere mentioned, that quantum discourse pertains to the nature of reality and its correlation thereto, it is incumbent to give special treatment to the nature and workings of quantum reality, say, its basic features – the way that quantum “things” exist, how they change and how they relate [13]. From grand quantum understanding, quantum reality, to put quite simply, is a huge complex network of connections. Something more like a spider’s web with a sort of “undivided wholeness” to use Bohm’s words, wherein the different ranges overlap. The various lines crisscrossing each other which make up the complex web agree in a way that they can all be said to be part of one quantum formation – unified quite compatibly – such that all the forces of nature, the particles that feel those forces and framework of space and time in which it all plays out [14] are all intertwined in and to every possible version of existence. Each of the supposed strands explains and describes certain properties but only according to the direction and dictate of the whole quite simultaneously in what in quantum parlance is known as quantum superposition.

In this setting, as a quantum physicist has it, there is no distance between objects, or indeed no solid objects in the sense that we mean them, and that the whole notion of “separate” has no basis in reality [15]. The reality of each is taken up and woven into the

other [16]. Its interconnectedness is such that whatever happens in any spot is relayed, transmitted, and affects every other aspect. Any such happening is but one visible aspect of that situation's deeper and very real, underlying possibility. Of note, quantum reality consists of patterns of shifting – it shifts its nature according to its surroundings [17]. This, in quantum philosophy, is known as “contextualism”. Beneath this somewhat manifestation, its internal order is intact. In effect, what it means is that quantum reality is about the whole situation. We can never, as we could in a postmodern setting, for example, isolate bits of a situation and analyze it independently. Perfectly wired into this complex quantum reality are essential features: both/and kind of thinking, indeterminacy, and the potential of a quantum system to be both particle and wave – their capacity to relate on both terms – what is called wave/particle duality. These are inherent features of reality. We shall next turn to try to flesh out and examine each of these features and see what a blueprint it could all make for a genuine social transformation for Africa – its social and political units.

Both/and Thinking

The whole of quantum reality is in fact a vast sea of potentials. Within the nature of quantum reality, the “both/and” kind of thinking is a rule. A very central thing in any philosophical system or theory that purports changes of any form is a “basic categories of thought”. This is evident in modernism, classical physics, postmodernism, and of course, quantum physics. Whereas the first two can be grouped as based on an “either/or” way of thinking; postmodernism in a way exhibits features we would associate with the “both/and” kind of thinking but of quite a different kind.

The “both/and” kind of thinking inherent in quantum physics call to question the “either/or” way of thinking, equally as well, is that which postmodernism appears to be advocating. Quite obvious, the quarrel with the “either/or” pattern is in connection with the fact that it confines and limits the grasp of reality – its scope. That of postmodernism is its ‘reckless emphasis’. In its bid for self-expression as touched on earlier, its concern is not about the whole (that is, toward some kind of unity with other voices). In every sense, this is contrary to the “both/and” kind of thinking in quantum reality. It recognizes the extent to which patterns of thinking hold us in their grip [18]. And purport to overcome the impossibility to think certain thoughts because our minds have not been trained to work that way [19]. It proposes and sees as imperative the need to get beyond apparent contradictions [20].

Indeterminacy

Quantum physics and the sweeping conceptual revolution that underpins it are entirely different in origin from classical physics. Unlike in classical physics where one thing follows another in strictly determined order and with predictable results, [21] quantum systems are inherently indeterminate. To put it simply, multiplicity and indeterminacy – the lack of any physical basis for the prediction of the outcome of an event are what permeates and characterizes the way any change occurs, or the process by which one quantum system is transformed into another [22]. The old Bohr’s atom captures this role of indeterminacy in the ‘leap’ that

transforms quantum systems quite well, though it is viewed obsolete now.

To Bohr, an atom hangs around in the solar system, with a heavy nucleus of particles at the center and rings of electron energy levels surrounding it [23]. Danah Zohar and Ian Marshall describe the situation quite eloquently, thus:

... the atom may become unstable for no apparent reason. There are no necessary “whys” or causes for events in quantum reality ... So, quite suddenly the electrons in a previously stable atom may begin to move into different energy orbits. And if they do so, there is no way of knowing by which path a particular electron might travel, nor why it finally “chooses” to settle down in some other orbit. All that we can say is that its path will be discontinuous ... [24].

The electron may go anyway – the lowest or highest state, wherever – it may double back on itself or leap over several other intermediate states as it so pleases. What, however, is peculiar and noteworthy here is that, when this happens, that is, when atom steps to either a lower or higher energy level as the case may be; in the different possible paths, its constituents rearrange themselves suddenly – like the collapsing of a house of cards [25]. It behaves as though it is smeared out all over space and time and is everywhere at once [26].

Such ‘different possible path’ the electron actually follows, in the language of quantum physics is known as virtual transitions. It is the possible journeys the electron makes before something actual (something measurable) happens. The actual journey, the one that results in the electron finding a new home and staying there, is called a real transition [27]. The existence of such different possible paths or virtual states is an indication that one can actually experience more than one reality at a time. Each is “on top of” the other as each simultaneously unfolds its content. These different realities collectively are known as superpositions. A ‘real transition’, then, is a quantum wave function – the eventual “collapse” of the said multi reality of quantum superposition into one single reality (an actuality). The Schrodinger’s cat “thought experiment” though was intended for other purposes, in many ways, did demonstrate this scenario. The “collapse” or “reduction” of the wave function is governed mathematically by what is known as the projection postulate [28].

Wave/ Particle Duality

The collocation, wave/particle duality embodies the idea that two very different theories can actually describe the same phenomenon – that an object could be described as either a particle or wave [29]. This is actually consistent with and as well central in quantum discourse. It is one of the revolutionary ideas thrown up by quantum reality. A particle is something that is contained in one place. A wave is something that is spread out [30]. As quantum discourse has it, ‘light’ is both. That is, light behaves like a series of waves and as well as like a stream of particles. From a deep understanding of quantum reality: neither aspect of the duality,

neither the wavelike properties nor the particle-like properties can be said to be better or more real than the other. The two complement each other and both are necessary for any full description of what light is [31].

Experimentally these wavelike and particle-like properties are measurable, at least, with the “two-slit experiment”, but it must be mentioned, that these experiments embody a limitation: the fact that it can only see one (that is, either wave or particle) at a time. One can never see the duality. It can be said that this idea of wave/particle duality supposes or confirms the “principle of complementarity” as well as the “uncertainty principle”. This explains that the idea of wave/particle duality is an important feature of quantum physics [32]. More than that, how this knowledge of its behavior helps us to understand a range of physical phenomena, including the question of quantum reality, is what we would think is important here.

In its behavior as it concerns quantum discourse is the implication that quantum systems have the potential to be both wave and particle; that it has the capacity to relate on both terms [33]. This wave/particle behavior of quantum systems is captured by Danah Zohar and Ian Marshall thus:

When two quantum systems meet, their particle aspects tend to stay somewhat separate and maintain shades of their original identities, while their wave aspects merge, giving rise to an entirely new system that enfolds the originals. The two systems relate internally, they get inside each other and evolve together. The new system to which their overlapping gives rise now has its own particle and wave aspect, and its own new corporate identity. It is not reducible to the sum of its parts. We can't say that ... the new system is composed of *a* and *b* plus the interactions between them. It is a new thing, an “emergent reality”. In the physical world, such emergence is unique to quantum reality [34].

Although the description above pertains majorly to quantum systems, the fact of its ‘overlapping’ and ‘internal relationship’ wherein nothing may truly be considered, so to say, separate from the other such as we find of quantum reality, leaves one thinking mostly about our social reality: how separated we have become from each other.

That quantum reality as we have closely x-rayed so far offers us a model for a new kind of thinking and thus, perhaps for some new social vision [35], is not in doubt. What, however, is mind-boggling is whether as human beings we can do this kind of thinking. In other words, can we evoke this knowledge of quantum reality – its qualities – in human nature, our social relations, and the community at large? Is there a quantum structure in the human brain that can grant us access to such insights of the quantum realm, and if it is the case, can we build it into a sort of interconnectedness and social unity? What can we project as the imagined basis of such interconnectedness and social cohesion? In

what will follow we will try to provide the answers to these questions; we believe this sort of dynamic principle of quantum reality can as well be applied at the larger social level in the ‘community of beings’.

Human Nature

Human beings are the basic constituent of what we call society. In a way, this translates to a kind of responsibility on the part of man – as to how he thinks, his actions, and whatever he does carry signs and symbols, implications, and intentions [36] that give the “outer” world an image. This image is what is fed on for opinion about a people. To such an extent, a society can be thought of as an extension of a part of the human person. Life in society, then, is not something “added-” to the human person; it stems from an important dimension intrinsic to human nature [37]. This is a hint at a sense of a ‘universal human nature, a window for a supposition that deep down the human person is a foundation – an innate mechanism or procedures either explicitly recognized or tacitly entailed [38] by which we can reach one another.

Agreed there is a whole manifest enormous diversity among us. The fact such as that, on genetic grounds, each individual is a unique combination of genes (with associated traits), and varies in tens of thousands of ways from the other; it is hard enough to deny a few such common, underlying evolved innate psychologies in us:

Each of us experiences ourselves as an individual with our own personal truth, our own unique style, set of emotions, and very individual conscience. Yet at the same time, we feel that we only know ourselves, only truly become ourselves, through the complex set of relations that bind us to nature, to others with whom we are in daily commerce, and to the culture of which we are apart. Our individuality, we feel, can never be wholly exhausted but neither, we recognize, can it ever be wholly isolated [39].

If that above, what it implies is anything true then somehow, though, it is something riddled with difficulty, especially, that of understanding (that is, how in particular, it is all connected) one can to such extent of what the extract suggests, state that:

... the nature of mind, the nature of society, and the nature of nature are all one and the same thing, that all are linked by a common physics, we have then a firm foundation for grounding both human nature and human efficacy in the (fundamentally) natural within ourselves [40].

Such a surge toward a relationship such as captured in the former extract becomes a clear confirmation of the latter. It is the defining quality of our human nature: something we all share – why as human beings in many ways we seem to operate on the same principle [41]. It shows that in each individual is some kind of network looking to connect with something outside us – the other, in a most fundamental way. The supposed “emergent reality” we

sought – that “something larger than ourselves” that will serve as the standard that will always inform and guide our individual actions and social correlations, can only emerge from such social liaison. That part of the human person that can bring forth this “new corporate identity” is what postmodernist thought – its influence and emphasis on difference and attitudes such as caring for nothing but oneself, one's goal, and one's emotions appear to want to destroy.

If we truly desire to articulate and institutionalize a new social reality, one with a whole new framework wherein as constituting individuals we can get to understand ourselves better, unanimously confront our development challenges and fulfill our potential as social beings [42], then we have to look deep inside us to ‘let-out’ that part of our human nature. What it means is that embedded in our individual minds is a structure that can enable dynamic integration – one that can preserve the different identities of participating members and as well douse the attendant sense of threat of the other, but more important, draw us all to a larger working whole. The individual – the self – its role becomes very crucial here, as he is the “conduit” through which the emergent properties of the community can be expressed.

The Self as Quantum Embodiment

The self – its role, in the sense described above, is very crucial on two interdependent and related fronts: one is our make-up – we are an embodiment of quantum – we are composed of its smaller entities [43]. The other is the fact that as human beings, within physical reality, we are at the center, ontologically part and parcel of everything around us [44]. Each, if considered on its merit grants the evidentiality of a supposed common human nature – of something which we all share. Both, that is, taken together carry the implication that individuation is a process toward wholeness [45]. It all points to man's richly complex nature and dynamism: the manifold possibilities ranging from his biological make-up, emotive responses, logical acumen, cultural, social, political, and religious dispositions that inhere man's being [46].

About man's make-up and what is in it that positions him “at the center” of everything is a tripartite relationship: the physics of human consciousness, the potential structure of human society, and the fundamental physics that underlies all else that is in the universe [47]. In this relationship, human consciousness serves, for the most part, as the assembling point to the other two, in that, the domains of these two other realms constitute the phenomenon that is illuminated. As a pervasive feature of the mental life of not only humans but as well other creatures, it function, basically, to give meaning to things. A given conscious state, then, is a relation of consciousness to the physical and social environment of conscious and non-conscious beings alike and as well the relation of unity and difference among conscious states themselves [48]. All these conscious activities human beings are said to be entangled with stem from somewhere in the brain. The point of this paper is that to such an extent, such as that consciousness arises from processes in brain tissue and all human beings are predisposed to consciousness arising from these processes in brain tissue, it can serve as the basis for interconnectedness and a point of social cohesion among us.

What informed this thought and how this is going to work, perhaps, are the big questions we would have to grapple with here. As we have mentioned earlier on, we are composed of quantum entities, well, it appears we would have to flesh that out to make it more meaningful why we think our conscious state can be our rallying point. On grounds of scientific findings, there are but two basic particles that make up the whole universe [49]. The particles are bosons and fermions. The basic constituent atom, that is, electron, proton, neutron, and all matter in the universe – human beings inclusive and all such other things we see every day around us are made up of fermions. Within our brain neural processes is a peculiarly quantum characteristic of a structure called a “Bose-Einstein condensate” (so-called because its properties were first suggested by Albert Einstein and another physicist Satyendranath Bose). It is a “warm and sticky phenomenon” (that belongs in the family of such other particles called Boson) in the brain. It does the job of coordinating fragmented information from thousands of exciting neurons into a coherent meaningful whole [50]. What for most people would be a surprise is the “grounded speculation” that our conscious mind arises from this stuff. Different kinds of experiments pursued by different physicists and biophysicists alike from different countries all seem to support that there is indeed the presence of warm quantum structures in the biological tissues found around such an area of the brain responsible for consciousness.

Conclusion

The boson family as implied above which the Bose-Einstein condensate is a worthy member is of special importance here for its sterling features. Unlike fermions, they are essentially “social” – with the tendency to cluster, overlap, and get inside each other's boundaries. The Bose-Einstein condensate, in particular, is thought to possess the “most unified structure in nature”. Our resolve to push consciousness for such a platform is informed by what as we have discussed, inhere it. We believe that the sort of unity Bose-Einstein condensate provides consciousness – its stream, can be extended such that it will not be only the elements in my ‘conscious field’ to use John Searle's words, so to say, but each and every one of us and our different conscious fields all thrown up into a larger conscious field by way of our been able to get into one another's conscious field, to understand each other. From this, we can see that within the human mind, the self is a possibility – it carries within itself what kind of society it wants. We can extend the continuity of that from our interior world to the world outside – we only need a new worldview – a new interpretation of social reality – one that is quantum oriented.

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