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## Theorizing from Fundamental Reality

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### Theorizing from Fundamental Reality

Reductive materialism implies that reality is made of inert matter. The mind then can be reduced to a system of neural connections and computational functions. Consciousness seems to arise out of this neural network, working memory gives us a sense of identity, and emotions are behavioral responses to our environment. This framework not only demystifies the mind; it also reduces all of nature and all organic beings to mere matter. Perhaps then we should inquire into the nature of this matter. By taking our cue from quantum physics we find that matter is not merely inert mechanistic building blocks that construct reality from the bottom up. And if reality at the micro level is not as we once thought how does this alter how we conceive of reality at the macro level; in particular how does this affect our conception of the mind, body and relations to other organic beings? In the first section of this paper I will, without too much complicated detail, illustrate how quantum physics has altered our view of reality at its most basic level. From there I will follow with a comparison to aspects of mysticism and conclude with what I think the consequences of this paradigm are.

#### Physics

Materialism as it is so often conceived stems from Isaac Newton. Newton's doctrine of materialism created the view of the 'clockwork universe'. (p.13, Davies, Matter Myth). In this framework we have absolute space and time, and everything working in a mechanistic and deterministic fashion. The theory of relativity replaced Newton's concept of space and time as containers and "the very arena in which the clockwork Universe acted out its drama was now exposed as subject to shifting and warping." (p.14, Davies, Matter Myth). Following this breakthrough the quantum theory further changed the view of inert matter. It was replaced "by a shadowy and paradoxical conjunction of waves and particles, governed by the laws of chance rather than the rigid rules of causality." (p.14, Davies, Matter Myth). In the world of Quantum physics we become aware that matter has far less substance than we previously believed and this consequently undermines materialism. A materialist would no doubt agree that there is equivalence between matter and energy and would have no resistance to modern theories of physics. However, it is the materialists' conception of matter at the macro level that may take some reconsideration. Quantum physics suggests a holistic framework at the most basic level of reality. On a larger scale physicists seek a grand unifying theory to explain all the forces in the universe.

The term energy is a considerably vague term commonly used in different contexts. In physics it is the 'stuff' in which reality is composed. Force and energy are what space-time is composed of and created by. In this context it is not meant to imply essences, since two electrons identical in all properties do not have distinct essences; unless you refer to their thin particulars and say there is 'that' electron and here is 'this' electron in order to distinguish them. Each form of energy such as a gravitational field or matter combined with force interacts in different ways. Energy was first hypothesized in order to have theoretical calculations work, and due to its vagueness it can be considered in some sense still a theoretical entity that plays a significant role in how he interpret the world. For the context of this paper energy can be considered more fundamental than matter but also less analyzable and distinct.

First we confront the notion that reality follows the rules of the clockwork Universe. In quantum mechanics we have the Heisenberg uncertainty principle, which states "That everything we can measure is subject to truly random fluctuations." (p.32, Davies, Matter Myth). This

undermines the thought that the universe is utterly deterministic, since we are unable to even measure the present state of the universe precisely. In addition we have the concept of chaos which stipulates that predictive errors rapidly increase leading to the conclusion that "infinite precision is impossible." (p.40, Davies, Matter Myth). From this it has "been discovered that so-called nonlinear effects can cause matter to behave in seemingly miraculous ways, such as becoming 'self-organizing' and developing patterns and structures spontaneously." (p.15, Davies, Matter Myth). Chaos "is such a special case of this; it occurs in nonlinear systems which become unstable and change in random and totally unpredictable ways." (p.15, Davies, Matter Myth). From here we glimpse the indeterministic nature of reality that has the ability to spontaneously create patterns and structures in co-operation.

Commonly with the big bang theory we are informed that it produced all matter, in which all the cosmic material of the universe was previously condensed into an infinitely dense point. The big bang also produced space-time itself. It was "this primeval energy that originated all the matter which went to build the cosmos, and all the energy which still powers the universe today." (p.8, Davies, Superforce). As previously stated we cannot think of matter as inert material. It is better to think of matter as a form of condensed energy, which then can be converted to other forms. As such "Quantum mechanics permits energy to appear spontaneously from nothing as long as it disappears again rapidly." (p. 142, Davies, Matter Myth). If we imagine a perfect vacuum of empty space, naturally it is empty of particles. But in fact the "fluctuating quantum energy of the vacuum causes the temporary creation of all manner of 'virtual' particles – particles that exist only fleetingly before fading away again." (p. 142, Davies, Matter Myth). These particles lack enough energy to exist for long, but illustrate that empty space contains these entities popping into existence briefly as if out of nothing. Therefore, "Real particles can be created in a similar fashion only by supplying a large enough source of energy." (p. 145, Davies, Matter Myth). Therefore what we consider to be solid matter is in fact further reducible to energy, which is not a restricted concept. Particles are not as stable as we ordinarily think matter is. They can appear out of empty space, are created out of energy and decay into many smaller particles.

It also appears that subatomic particles can also behave like waves. The Schrodinger equation states that there is a wave associated with each particle. This wave function spreads throughout the universe, being stronger with the position of the particle and weaker the further it expands from the particle. When we measure a particle the wave function is said to collapse and we can determine the position of the particle. When we are not measuring the particle the wave functions spreads out once more interfering or combining with a network of other wave functions from other particles. These wave functions can combine enabling for example "large numbers of electron pairs to adopt the same wave configuration effectively creating a gigantic electron superwave." (p. 206, Davies, Matter Myth). In principle, "even macroscopic objects such as people and planets have their individual quantum waves," (p. 207, Davies, Matter Myth). These effects at the macro level are not noticeable since "the greater the mass of the object involved, the shorter the waves," (p. 207, Davies, Matter Myth). The possibility that physical objects can have distinctive quantum waves demonstrates that subatomic reality can manifest qualities even at the macro level. This particle-wave duality depends on the circumstances and is considered "complementary aspects of a single reality." (p.208, Davies, Matter Myth). And the particle wave functions that encompass the universe combining and interacting with other wave functions implies an interconnectivity to reality; a holistic network of energy relations.

In addition to being able to manifest properties of either a wave or a particle it also seems that particles have an 'awareness' of other particles. When experiments are done the particle seems to 'know' "where it belongs in the interface pattern that builds up from the flow of thousands or millions of individual particles." (p. 212, Davies, Matter Myth). This is considered "clear evidence for the holistic nature of quantum systems, with behavior of individual particles being shaped into a pattern by something that cannot be explained in terms of the Newtonian reductivist paradigm." (p. 212, Davies, Matter Myth). An interesting problem arises when trying to measure a particle; we find we cannot measure both the position and the momentum of a particle. In fact it appears a quantum particle does not possess both a definite position and momentum simultaneously. Since subatomic particles of the same kind are identical in properties, the problems with measurement and the unifying wave behavior blur distinctions and identity among particles. Einstein suggested the problems with measurement was due to fallibility of our measuring instruments, and devised a way to measure both these aspects. In this method you take two twin particles and shoot them outward, you can then measure the position of one and the momentum of the other. However, even once they have separated off, this strange effect persists so that once you measure the first, the other responds in kind and we still lose information on the momentum or the position. This

again “implies that once two particles have interacted with one another they remain linked in some way, effectively parts of the same indivisible system.” (p. 224, Davies, Matter Myth). This is not to suggest that particles of this nature are ‘thinking’ but that they are more connected than they appear in a relational system; which gives them an ‘awareness’ of where they are in the system and what other particles are doing.

One of the most profound mysteries seems not to be how matter was created but how life was created. Fundamentally there is “no sharp division is drawn between living and nonliving systems.” (p. 285, Matter Myth). Definitions of life entail certain properties such as “the ability to reproduce, response to external stimuli, and growth.” (p. 286, Davies, Matter Myth). The problem is “other, manifestly inanimate systems also share these properties.” (p. 286, Davies, Matter Myth). The origin of life is regarded as “just one step along the path of the progressive complexification and organization of matter.” (p. 285, Davies, Matter Myth). Thus “If matter and energy possess an innate tendency to self-organize, then one would expect to find life arising again and again, given the right conditions.” (p. 285, Davies, Matter Myth). The fact is that matter itself is energy and energy in a complex relational system, life may be a different manifestation of arrangement of energy and matter. Life, it may turn out, is another manifestation of matter, in which energy and its ability to create systems and self organize become apparent at the macro level.

To conclude this section we can see that subatomic reality is not a firm and set structure. Of first importance is that quantum reality is not covered by strict deterministic rules but probabilities and can be quite unpredictable. Secondly, even apparently chaotic systems seem to have the ability to self-organize. The ability to self-organize into systems and structures gives us an understanding of how reality that is so unpredictable can compose itself into something more stable. Thirdly, matter is just contained energy and particles have wave formations that interact with other systems and other particles at any distance from them and even combine to form superwaves. This interaction of particles displays a unity and holistic impression.

### **Mysticism**

Materialism restricts how we view the world, what we consider impossible and possible. However, physics as illustrated above may demonstrate how a mystical worldview may accurately portray reality at a micro level and how this can broaden our exploration of reality at the macro level. Although no one would describe a chair based on its atomic construction we are informed that this underlying structure is what reality is composed of. And if reality is composed of inert lumps of matter, then that leads to seeing everything as distinct entities that are not connected. If, however, we conceive of reality as composed of energy and matter we are led to see the possible interactions of things we consider distinct. Perhaps this view is a paradigm shift that is needed to create a less harmful understanding of our place in the world. In fact some physicists “have emphasized the close parallels between quantum physics and oriental mysticism, with its emphasis on the unity of existence and the subtle relationship between the whole and its parts.” (p. 226, Davies, Superforce). In this section I use the term mystical as an all-encompassing term, referring to aspects of religious, mystical philosophy and experiences that do not fit into a reductive naturalistic system.

The mystical experience can be defined as having the characteristics of ‘nonordinariness and profundity’ (p. 49, Brainard). Certainly definitions of the mystical can be vague and refer to many conventional experiences, but then experiences of pain can also be very subjective and difficult to describe. We can say then “‘the subjects’ identification of his experiences as mystical entails the belief that it cannot be exhaustively explained in naturalistic terms.” (p. 55, Brainard). Experiences that are nonordinary or ineffable refer to the inability to be explained ‘in a conventional, naturalistic context’. (p. 55, Brainard). It is suggested here that is we align our investigations with modern physics such ‘mystical’ phenomena may be analyzable instead of outright discredited.

The mystical experience often entails an experience of unification with the divine or the cosmos. This experience of oneness necessarily requires a different level of awareness. We should not disregard ‘potential forms of consciousness entirely different’ from our normal waking consciousness. (p. 56, Brainard). If it is true that ninety percent of our consciousness is unconscious, including some rational thought processes, then it is possible that at some level we are aware of the unity in reality, of interactions in reality that we are not normally. Part of this more subtle awareness is illustrated in our ability to subconsciously read the minute facial changes in someone’s facial expressions, which give us a feeling about what is actually going on with that person contrary to verbal evidence. Similarly, there is ‘intuition’ that gives us a feeling about a situation or person, which is also contrary to other evidence. These suggest we are more in tune with our environment than we might be consciously aware of. The mystical experience is a

magnification of this awareness, which is considered more profound and meaningful to the person. Given the connectivity and holistic elements found in the subatomic realm we should not outright discount the awareness of unity we may find at our level of consciousness.

In mysticism there is an emphasis on the unity of all things. This is reflected in physics with the very fact that everything is reducible to energy and that particles interact at a distance with each other creating a holistic network of interactions and patterns. Other mystical philosophies, such as Buddhism, emphasize the more transitory element of reality. The Buddha “stressed the impermanence of phenomena and the absence of any enduring nature in ‘compound’ things.” (p. 72, Brainard). And really matter is not as solid or enduring as we might sense visually. There are virtual particles appearing and disappearing from apparently empty space. Matter is created from large quantities of energy, but those particles inevitably decay into smaller particles. Therefore we have a unity-in-difference theory. Everything is a unity in that it is all composed of energy, but there is also flux and difference as energy has many forms, interactions and instabilities.

Mysticism often reflects the notion of appearance and reality. The contrast between appearance and reality is to be found in many systems of thought, from physics to philosophy. In physics the contrast is drastic; the subatomic realm being one that is foreign and invisible to us. Reality becomes multi-layered with only the macro level being open to our senses. Objects that appear to be solid are in fact mostly empty space and particles. Our sensation of time passing and the distinction between past and present is not in accord with the theory of relativity where time and space are relative and time is often understood to be a static block with no real distinction between past, present and future. The reality we live in is uniquely defined by our biological senses and perceptions, so our view of reality is limited to this scope. The fact that reality may resemble the quantum realm more than we notice is a result of our physical limitations. Buddhism, as in the theory of relativity, there is no personal ‘now’. In Buddhism the “Enduring entity is appearance only.” (p. 74, Brainard). In fact, “What we might conventionally take to be an enduring object is presumed to be a temporal sequence of discrete presences with each presence contingent on the one before.” (p. 74, Brainard).

It is not merely that certain accounts of reality may mirror more closely subatomic reality, but that they may also describe how to think of mind and body on this account. If we follow reductive materialism the mind becomes somewhat like a side effect of the physical, not a distinct entity. With dualism we theorize two distinctive substances, the thinking substance and the material substance but are at a loss to explain the connection. If however, we support a monism of energy that does not conceive of matter as inert we are open to more possibilities. As outlined previously life may be a different development of matter and energy. Under this account we may have more energy produced than the particles we are composed of, energy fields and waves that are created by our unique matter configuration. We still have the brain with all its evolutionary advantages gained by living in the context we do. We can still have a connectionist view of how the brain operates, but those neurons firing may be conceived of as electrical impulses and matter combined in a unique way. The brain does not have to be the centre of all consciousness and awareness. As in eastern medicine it is the entire body, the lived body that is of importance. The ‘chi’ or energy runs throughout the body in a pattern of meridians, much like blood flows through the veins and capillaries. This energy is not independent of the body or vice versa. Each is dependant on each other and make what it is to be an organic entity, with each affecting how the other operates. This can be seen as a vital force or essence but also as energy or wave function or our material composition.

Taoism not only reflects the unity of the cosmos but also of this energy in matter theory. Taoism reflects the idea that all matter is energy: “The vital essence of all things: It is this that brings them to life. It generates the five grains below And becomes the constellated stars above. When flowing amid the heavens and the earth.” (p. 12-13, Roth). There is also a suggestion that this energy creates unique features of life such as thought: “The vital essence: it is the essence of the vital energy. When the vital energy is guided, it (the vital essence) is generated, But when it is generated there is thought.” (p. 60, Roth). Thirdly energy is seen to be directly related to the body; in that there is a direct link between your mental wellbeing, to the flow of this energy and therefore your physical wellbeing. Finally there is the suggestion that there is a relation between your energy and the environment: “if you are in a bad mood people will react to you with hostility.” (p. 119, Roth).

Taoism suggests a framework for understanding this postulated matter/energy relation. Our body is seen as material energy and vital energy in a balance that can be disrupted by our lifestyle. This is why eastern medicine deals with trying to maintain a balance in the body via preventative measures and correcting imbalances with holistic remedies. If a single particle can

have a wave function that spreads throughout the entire universe surely we can have a similar wave function that interacts with our environment and the physical matter we are composed of.

### **Implications**

It is my belief that materialism is a limiting paradigm. Only because materialism stops at matter and implies that matter is inert and that consequently none of the subatomic anomalies affect matter at the macro level. This paper is also founded on the presupposition that ontologically we gain understanding of our reality and bodies by looking at the fundamental reality of subatomic realm. And a framework that reflects quantum reality would be less limiting than materialism. There are many benefits to looking at the world as composed of energy in a relational system rather than inert building blocks. In this section I will outline some of these benefits.

There is an extensive gap between the subatomic reality and the physical reality we find ourselves in. Therefore, we cannot say that just because electrons are interchangeable indistinct entities that we are likewise. Rather we should analyze how the subatomic realm works, and extend that understanding to how systems operate even at the complex level. Subatomic reality reveals to us its self-organizing and unifying nature. Physical reality is built up from there into complex systems. Although we are composed of these particles fundamentally at each level of organization we become more complex and distinct from other things. Therefore, we are not living in a world that is unified or related as closely as the subatomic level of reality.

Due to this self-organizing nature of particles and matter, we can assume that this process continues into each level of complexification. It is the difference between the one and the many. Subatomic reality represents the unified element that becomes diversified into the many. To say that life is a unique combination of matter and energy may entail that life has the ability to extend itself into the environment and make connections. Certainly life in all its forms undergoes the process of evolution, where a species changes due to its environment, and this process itself can be seen as the organization of life into systems that interact and respond to other systems. This inter relation of organic entities can be described as the Gaia Hypothesis. In the Gaia Hypothesis the entire world is considered one entity. Each group of species would be sub systems to the whole. This hypothesis is useful for understanding the inter relation of all entities in this worldly environment. Perhaps we can see how matter has organized itself into one collective entity, in which each component is not entirely independent.

We might even speculate that this interaction with our environment is even on a deeper level. In that sense our energy states would affect the energy states of those around us. Although I would not want to exclude this possibility, I cannot suggest how that sort of complex system of energy relations would work. It is speculated that all life forms emit an electromagnetic field or 'aura' that may interact with our immediate environment and perhaps affects our physical state. This interaction at an energy level is mentioned in the Taoism section above. These speculations try to explain such phenomena as intuition or gut feelings. In addition to how we feel the tension in a room, how negative moods affect our health and others mentally, or how we can feel the presence in a room without seeing someone first. It is an interesting thought, that our electromagnetic fields are affected by other electromagnetic fields, even beyond what we know of. There may be no 'aura' or vital energy, but there may be some electromagnetic or quantum interaction with our immediate surroundings. In this sense our lived bodies interact with our environment on many levels, many not directed by our conscious awareness. This bodily interaction would be due to the unique composition of all organic entities that gives us awareness beyond ourselves. This awareness would not be limited to humans in any sense, but is dependant on our physical composition, evolutionary adaptation and sense organs. A plant's awareness of its environment, such as turning toward light, is far different than our awareness through all our senses.

Our interaction and subconscious awareness with our environment can be seen as a factor arising from the matter/energy combination in organic beings. In humans we might refer to these being in the domain of the mind or a lived bodily awareness. Part of this combination is reflected by matter infused with electrical impulses that gives us a conscious awareness via brain activity. Many other facets of our mind, such as reason, emotions and memory can be attributed to our brain and its evolutionary development. The mind does not arise out of matter nor reduced to matter, but is a product of this energy/matter relation. We have then an account of the lived body. This is not another form of dualism where we have matter and energy combined to create a lived body. This is because matter itself is just a different manifestation of energy. This implies only that in organic beings this composition is different than in inorganic things. This leaves us with a reductive monism of energy; where we have a matter component of energy and an additional form of energy in conjunction that forms life. We might be right to dismiss the "ghost in the machine – not because there is no ghost but there is no machine." (p. 309, Davies).

The idea that the body is infused with energy greater than contained in its particles does not exclude mind over matter experiences. The mystical experience may be an altered awareness of the interconnectedness of reality. Likewise mind over matter experiences may illustrate interconnectedness of energy and matter in the lived body. Experiences under this heading are like mystics being able to control their heartbeat and even halt it. As well as people under hypnosis developing blisters when told they are being burned by an ordinary item. And finally this would include biofeedback techniques that aid people in controlling such things as high blood pressure, ADD, and even chronic pain. In the lived body the mind's psychological problems and the body's physical problems would be interconnected and therefore should be treated holistically. Eastern medicine has long treated the entire body of the patient. Whereas Western medicine is often criticized for its intrusive treatments that treat the symptoms and often not the underlying problems. Understanding that a person is more than matter, and not dualistically separated into a mind and a body could only improve how we treat individuals and how we understand illness.

We find in modern physics a reality that is not as modern materialists base their theories. By changing the framework to favor quantum physics and how we now understand matter we are open to explore many more facets of existence in a different way. Mystical worldviews, in some interesting ways, mirror ideas found in modern physics quite closely. Drawing from this mystical framework and using modern physics to understand fundamental reality we can gain a broader understanding of what it is to be a lived body in relation to other organic entities. Furthermore we should not ignore phenomena simply because we are taught it is 'impossible' as it may be analyzable under a different framework. There seems to be a greater mystery as to how there is life rather than how there is matter. Reducing our notion of matter to particles composed of energy that have the ability to self-organize and co-operate illustrates that matter is not inert. Inert matter does not seem to have life creating possibilities. If life is a different configuration of energy in matter then at least we can discern a fundamental difference between a person and a rock, even though fundamentally their subatomic constituents are the same. Furthermore if organic entities have this different composition of energy it could help develop a less limiting schema for understanding human consciousness and mind. This consciousness would be at least at the sub-conscious level would have a deeper awareness of the environment that extends beyond the physical senses. Instead of reductive materialism why not further reduce reality to a monism of energy. Energy is a vague term but it is also non-restrictive and it may very well be the tie between the subatomic realm and the mysteries of the human consciousness and capacities.

### Notes

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