

**Pluralism With A Proviso, Part Three**  
**A PARADOX AT THE HEART OF RELIGIOUS MYSTERY: EVIDENCE FROM THE**  
**CONSCIOUSNESS DEBATE AND FROM QUANTUM PHYSICS**

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Baltimore, MD: MAR-AAR, March, 2004

26 Apr 24

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Two years ago, I began a series of papers addressing certain problems of a pluralistic approach to metaphysical differences among religions. As a way to teach and understand world religions, pluralism's impartiality gives it important advantages over either exclusivist or inclusivist approaches. But pluralism comes with a price. Its emphasis on metaphysical and epistemological diversity and difference leaves us without pancultural truths and values. Moreover, it contradicts the teachings of most religions, which claim to give us metaphysical absolutes and universal truths.

The question raised in *Pluralism With A Proviso, Part One* was whether there might be a way to amend pluralism that would provide for metaphysical absolutes without slighting the genuine differences among religions. To answer the question, I used a story from science to demonstrate how two entirely valid accounts of reality might indeed contradict each other. For almost two hundred years, there were two competing theories of light. One described light as particles and one described it as waves.<sup>1</sup> The debate finally concluded not by choosing one account over the other but rather by accommodating both accounts in what remains a paradoxical picture of material reality. Extending this story to religious pluralism, I proposed that certain metaphysical differences among world religions might likewise reflect valid, different views of a shared mystery of ultimacy.

In Part Two, I further proposed a likely candidate for that mystery. I described a philosophical question that has been debated since the beginnings of philosophy, East and West, and has, indeed, splintered worldviews into different religious camps. That question is: Where should humans turn to discover what is ultimately true or real about ourselves and our cosmos? Should we turn to "universals," that is, to those things that are unchanging in space and time? Should we turn to the experiences that reveal such universals, experiences typically painted as

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<sup>1</sup> The two accounts of light were Christian Huygens' wave theory and Isaac Newton's "corpuscular" account. These theories were not successfully resolved until Einstein proposed that light was made up of waves composed of tiny bundles or "quanta" of energy, that is, photons. Nevertheless, the two pictures remain in Heisenberg's matrix mechanics (which begins with matter as composed of quanta) and Schrödinger's wave mechanics (which begins with matter as composed of waves).

contingent on circumstances, different one from another, and mutable? Or should we turn to both?<sup>2</sup> I called these three approaches: 1) essentialist, 2) existentialist, and 3) dualist.

Today, in Part Three, I examine more closely the mystery of reality responsible for fracturing metaphysics into these three options. At the heart of the mystery lies a paradox, one that shows up widely in our experience, and notably these days in debates over the nature of consciousness and in quantum mechanics.

Let's begin by examining the "dualist" approach, which is an amalgam of the other two. It is also the approach that most closely matches our everyday native sense of reality,<sup>3</sup> and it is in this context that I want to look at dualism now.

In the first place, our everyday dualist perspective supports the essentialist idea that reality is characterized by universals, that is, by properties that reoccur in space and time.<sup>4</sup> A property is an aspect of our world that we recognize, *re-cognize*, one that we see again in current circumstances as being essentially the same as we and others have seen before in other circumstances. I recognize an object as a cat because it is like other cats. It fits into that mental category; it instances universal feline qualities. These properties are real properties in the sense that they are mind-independent; they are something we can be wrong about. We contrast the real

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<sup>2</sup> Our records of Western philosophy begin not long before Heraclitus and Parmenides and their difference of opinion over whether reality was ultimately ever-changing or eternal. It was Heraclitus who reputedly said that one never steps into the same river twice. Parmenides, on the other hand, insisted that being was of one kind, unchanging, and eternal. This debate has never been resolved. We also find this debate in India between, for example, the contrast between the Hindu notion of ultimate reality as universals and the Buddhist notion of existence as in constant flux.

<sup>3</sup> Regardless of a religion's worldview or whether the fact is explicated acknowledged, in everyday life we encounter a world that is, on the face of it, composed of particulars, and a particular is a mix of existential presence with universals (i.e., attributes). Therefore, the question that separates the dualist from the other two options is not whether these two components describe the nature of everyday reality, the "physics"; all these options agree on this point. The question is rather whether they describe the "*meta-physics*," what lies behind the physics. For the Hindu and the Buddhist, this corporeal nature of the particulars of everyday, unenlightened experience is not the ultimate truth. And it is not so because one of the two ingredients — either the existential presence or the enduring essence — is not taken as a mark of ultimacy. (Perhaps it is more accurate to say that Indian philosophy does not take both poles of this dyad as ultimate at the *beginning* of one's quest for higher truth. There is much evidence that the bracketed pole does come back into play as one nears enlightenment. See F. Samuel Brainard, *Reality and Mystical Experience*, Penn State Press, 2000, pp. 175, 264.) Dualism, on the other hand, takes reality at face value, as we experience and think about it in our everyday lives. In these religions, everything that is ultimately real typically contains both existential presence and universals.

<sup>4</sup> In philosophy, East and West, the reality of universals remains an open question. However, in our everyday, practical affairs, the matter is more settled. We are able to navigate through our circumstances because we recognize repeated qualities; if it were not for these qualities, nothing would be predictable. The mere practicality of universals makes them at least pragmatically real.

to the fanciful, deluded, false, counterfeit, or merely apparent. If the earth is really round, then it has the property of being round regardless of whether or not I or others see it that way.<sup>5</sup>

Universals like these seem to underlie all that we call ‘real’ and are that to which essentialists turn in their accounts of ultimate reality.

In our daily life, however, at least in the West, what we typically call “real” is not the property apart from its instances, but rather the instances themselves; the particulars that we actually perceive in our day-to-day lives.<sup>6</sup> It is not the quality of being a cat that is real; it is the cat itself; not the quality of being a tree or desk or person, but the particular trees, desks, people themselves that we call “real.”

Thus, in the second place, the everyday dualist perspective supports the existentialist claim that realities are particulars. Or, more precisely, a reality is what is existentially present, what is interactively involved in the cause-and-effect of the universe.<sup>7</sup> Think of Buddhism’s *pratītya-samutpāda* in this context, interdependent arising. To be real, something must be a player in the cosmos. Direct perception is certain proof of this second aspect of reality, whether that perception is by us or by another. It places a thing or event within the cause-and-effect dynamic of direct experience. This aspect of reality has nothing to do with properties or recognition or even mind-independence; it is strictly about pure presence, “thereness,” what the Buddhists call *tathatā*. Recognition and mind-independence come instead with the properties; it is the properties that are the universals and make particulars appear to be the same over multiple observations.

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<sup>5</sup> We make this distinction between reality and mind-dependence or personal opinion in part because the former is much more important to us in our practical affairs. If I’m crossing a street and don’t see a truck coming, my opinion isn’t going to keep me alive. What I want is insight into the situation as it truly is, as it is independently of my mind.

<sup>6</sup> We tend to be Aristotelians rather than Platonists in our everyday view of the reality of universals. Certainly, the objects of our lives that we typically call “real” are characterized by properties, i.e., universals. But whether universals are themselves real apart from particulars is another matter that exercises principally philosophers.

<sup>7</sup> Perhaps it is not exactly correct to say that qualities are not in themselves real in the dualist paradigm. Historically, some of the more important features of our lives have almost always been reified as gods or spirits, e.g., death, fire, wisdom, etc. But reification like this implies that they are a kind of particular, something like the objects of everyday experience. That is, they are qualities but with particularity; they have a “presence” of some sort; they directly interact with and in the material world. For a discussion of how gods are like qualities, see, e.g., Robin Horton, “African Traditional Thought and Western Science,” in *Rationality*, ed. Bryan R. Wilson, Oxford: Basil Blackwell, 1970, pp. 131-71; or Brainard, pp. 148-51.

Presence also has nothing to do with sentience or consciousness; presence is equally guaranteed if something causally interacts with inert matter.<sup>8</sup>

In sum, we live in a world made of objects, events, and relationships that appear to be characterized by both universals and existential presence. No metaphysics that I know of, East or West, disputes this as the *prima facie* reality of human life.<sup>9</sup> The problem does not lie at this superficial level; it comes when we probe deeper — try to discover reality’s underlying nature. It is at this point where we come to the triple fork in the road. We can proceed straight ahead with a dualist view of reality, as we tend to do in the West in both our practical affairs and in our Abrahamic religions.<sup>10</sup> We can opt for the essentialist side as do most if not all Hindu schools, as well as science and much of Western philosophy up to the last century.<sup>11</sup> Or, finally, we can turn to the existentialist side as do most Buddhists and contemporary postmodern/poststructural trends.<sup>12</sup>

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<sup>8</sup> The fact that existential presence does not require sentience is obvious in the case of electronic devices like digital cameras, telephones, and computers. To be real in this sense of causal participation, light and sound can interact with inert, material sensors; they do not have to interact directly with our eyes or ears.

<sup>9</sup> See Brainard, pp. 71,72.

<sup>10</sup> The dualist approach is an amalgam of the essentialist and existentialist approaches. Most versions of Abrahamic monotheism fall into this category. One of the main topics discussed in the last paper was how the monotheistic notion of God differs from Brahman in that, for God to be thought of as real in these traditions, God must be more than a universal. Besides being unchanging and omnipresent, God must have some sort of existential presence, although I hasten to add, not necessarily of a conventional kind.

<sup>11</sup> The essentialist approach seeks to explain reality in terms of what stays the same from one experience to the next, that is, in terms of one or a few underlying universals. Advaita-Vedānta (non-dual) Hinduism, for example, presumes that everything derives from Brahman, the one unchanging, omnipresent basis of all that exists. Sāṅkhya-Yoga Hinduism traces all of reality back to two universal bases, *prakṛti* and *puruṣa* — primal matter and pure consciousness. Likewise, most Western philosophies up until the last century traced reality back to one or several primitive notions: Spinoza to God, Descartes to matter and mind, Whitehead to actual entities and eternal objects, and so on. Note, too, that philosophers like Descartes and Whitehead that posit more than one foundation typically take a foundation from each side of the essentialist-existentialist debate. Thus “matter” and “actual entities” give the bases for existential presence, while the concepts, etc. of “mind” and “eternal objects” refer to universals.

<sup>12</sup> The loosely called “existentialist” approach turns to direct experience rather than universals to discover what is ultimately true and real and emphasizes experiential presence over essences in its accounts of ultimacy. In most if not all Buddhist schools, for example, universals are not foundational, they are derivative. Apart from the special case of the *dharmas*, Buddhism presumes no mind-independent realities. Instead, there are experiences and the interdependent relationships among all moments of experience, what is called *praṭīcica-samuppāda* (Sk: *pratītya-samutpāda*), “dependent co-arising.” Likewise, in contemporary postmodern and poststructural philosophies, metaphysical universals are presumed to be derivative of cultural and linguistic circumstances. Universals are not basic. What is basic is the conditioning of moments of experience through their interplay with circumstances. Our worldviews and metaphysics are creations of that process.

I will not today elaborate on how these different religions and philosophies exemplify these three alternative views of reality; that was the subject of Part Two. Instead, I want to flesh out the paradox behind these apparently intractable alternatives.<sup>13</sup>

Per my discussion so far, the paradox causing this mystery might be called “essence-presence mutual exclusion.” What I mean by this is that we seem to have two ways of analyzing reality that produce two conflicting results. One is top-down; it begins with what is the same over multiple observations, that is, it begins with essences and universals. The other is bottom-up; it begins with what is so in a single observation, that is, it begins with first-person, direct experience and particulars. The top-down standpoint is thus that of the collective, while the bottom-up standpoint is that of the individual.

The conflicting results generated by these two standpoints are obvious in the philosophical differences I discussed in Part Two, but they also show up pervasively in our conventional understanding of existence whenever we scratch below its surface.

Take for instance how we can be conscious of a thing from both standpoints at the same time, but with contradictory results. Suppose I were to hold up my arm and ask you whether my wrist watch was the same watch for everyone in this room or whether it was different. When I’ve asked similar questions in my classes, I’ve gotten strong defenders of each answer. But both answers are correct. From the standpoint of the collective, the watch is an objective reality, independent of any one individual’s seeing process. If I take my watch off and put it on the desk, it is on the desk for everyone. From the standpoint of the individual, however, it is, just as correctly, dependent on and a function of our different views. Each of us sees it a different way.

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<sup>13</sup> What seems to me most telling in these debates is that none of these three views of ultimacy has prevailed over the others. Hinduism, Buddhism, and Western monotheism are still metaphysically at loggerheads. Each has its strengths and weaknesses. The principal weaknesses of both the essentialist and existentialist views arise, perhaps obviously, from their emphases on one approach over the other. But the dualist approach fares no better. Indeed, the entire mystery seems to boil down to the fact that essentialist and existentialist views do not seem to coexist very well. One sees the essentialist and existentialist views dueling with each other in the Abrahamic notion of God. While it is reasonable to suppose, along with essentialists, that our universe has a fundamental nature (some assumption like this surely drives much of physics), it is very difficult to understand that fundamental nature originating with a being that has an individual existential presence of its own apart from creation. Then one faces all the Monotheism 101 paradoxes rooted in the divide between God and creation. If God is, indeed, all-powerful and all-knowing, how can we have free will? If God is all-powerful, all-knowing, and good, why do people suffer and do evil things? Notice that both these problems plaguing monotheism go away nicely if we collapse God and creation together. But, if we do this and preserve God, we end up with the essentialist approach: all creation is grounded on God as the supreme, fundamental principle in the manner of Brahman in Advaita Hinduism. If we do this and preserve creation as an interactive, causal matrix, we end up with the existentialist paradigm. In other words, all these choices seem equally problematic.

The same dualism appears when we reflect on ourselves. From the standpoint of the collective, we grasp how we are the same as others, how we share physical laws and psychobiological processes that determine our choices and behavior and thus seem to preclude the possibility of free will and volition. From the standpoint of the individual, we grasp our individuality, creativity, and unique perspective, and we seem from this view to have indeed free will and volition.<sup>14</sup> I raise my arm. Looked at one way, it is determined; physiology, circumstances, and so on are responsible. Looked at another way, it is volitional; I do it. Both versions seem equally valid, but because it is ourselves — seemingly undivided, nondual individuals — who are playing both roles, it is very difficult to grasp how this can be so. How, in respect to *the same act* of raising my arm, can I both be a free agent and also be determined by lawfulnesses and processes beyond myself?

Not surprisingly, the mutual exclusion of these two standpoints shows up in the contemporary philosophical debate over the nature of consciousness. This debate springs from two competing views of consciousness called the “first-person” and “third-person” views, which divide along exactly the same line that divides the individual and collective standpoints. The first-person view describes consciousness from the standpoint of the individual as an experiential presence — what it is from the inside, so to speak. When a subject examines his or her own consciousness in terms of privately experienced subjective qualities (i.e., “qualia”), like the actual experience of pain, that is a first-person approach. The third-person view describes consciousness from the standpoint of the collective as a generalized feature of all conscious beings. When a scientist looks for consciousness in a neurological process, for example, that is a

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<sup>14</sup> In epistemology, perception and reason are different sources of knowledge from which we derive different kinds of knowledge. This difference also applies to the kind of knowledge we have of ourselves. We perceive objects — see and touch a desk, for example — in the here-and-now, not in the past or future. Thus, who we are in perceptual experience is the person who lives in the here-and-now of the seeing and touching process. On the other hand, when we reason — when we think about and reflect on the desk and ourselves — who we are within our reflections is typically a spatiotemporal “particular.” That is, we are enduring objects of existence that take up space and last over spans of time. The desk or person that we think about may, perhaps, be the desk or person of the immediate moment, but it is more likely to be the one that was here yesterday and will likely be here tomorrow as well.

This distinction between perception and reason has been of considerable interest to empirical researchers in terms of the difference between perceptions and conceptions. Both clearly involve cognition and resemble hypotheses in science; both involve conclusions based on past experiences. Conclusions in perceptions, however, apply to the present (typically to what will happen within the next second), while conclusions in conception typically intend to be timeless. (See, e.g., Richard L. Gregory, in *The Oxford Companion to the Mind*, ed. Richard L. Gregory with the assistance of O. L. Zangwill, New York: Oxford University Press, 1987, pp. 608-611.)

third-person approach. No one seems able to reconcile these two views satisfactorily. Again, the two alternatives seem to mutually exclude each other.<sup>15</sup>

These same two standpoints also show up in a variety of other key places in our understanding of ourselves and world. But before going further, I want to modify the standpoint of the collective somewhat so as to better accommodate both essentialist and existentialist positions, as well as our everyday experience.

Those in the existentialist camp — Derrida, Foucault, Rorty, Habermas, Gadamer, Buddhists like Nāgārjuna, for example — argue that reality is largely, if not entirely, a cultural artifact. No doubt, they are at least partially correct. Certainly, we do create many of our own realities — cars, houses, the walls of this room, for example. Certainly, too, the properties that describe such realities — the property of being a car or house or wall — are likewise human artifacts, universals that originate with human beings and not with, say, cats or ants.

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<sup>15</sup> In his introduction to *The Nature of Consciousness: Philosophical Debates*, Güven Güzeldere sees the difference between the first-person and third-person views as “the primary responsible component in the consciousness puzzle” (*The Nature of Consciousness: Philosophical Debate*, Ned Block, Owen Flanagan, and Güven Güzeldere, ed., Cambridge, MA: MIT Press, 1997, p. 24).

In his entry on “Consciousness” for *The Oxford Companion to the Mind*, Daniel Dennett also presents the consciousness problem by means of this distinction between first- and third-person views. He writes:

Our ordinary concept of consciousness seems to be anchored to two separable sets of considerations that can be captured roughly by the phrases ‘from the inside’ and ‘from the outside’. *From the inside*, our own consciousness seems obvious and pervasive: we know that much goes on around us and even inside our own bodies of which we are entirely unaware or unconscious, but nothing could be more intimately known to us than those things of which we are, individually, conscious. Those things of which I am conscious, and the ways in which I am conscious of them, determine *what it is like to be me*. I know in a way no other could know what it is like to be me. . . .

When one considers these others (other folk and other creatures), one considers them perform *from the outside*, and then various of their observable or determinable features strike us as relevant to the question of their consciousness. Creatures react discriminatively to events within the scope of their senses: they recognize things, avoid painful circumstances, learn, plan, and solve problems. They exhibit intelligence. . . .

The obvious presumption is that the various ‘outside’ indicators are more or less reliable signs or symptoms of the presence of that whatever-it-is each conscious subject knows from the inside. But how could this be confirmed? This is the notorious ‘problem of other minds’. In one’s own case, it seems, one can directly observe the coincidence of one’s inner life with one’s outward observable talents for perceptual discrimination, introspective avowal, intelligent action, and the like. But if each of us is to advance rigorously beyond solipsism, we must be able to do something apparently impossible: confirm the coincidence of inner and outer in others. (Daniel C. Dennett, in *The Oxford Companion to the Mind*, p. 161)

For some other writers on this dualism, see Sydney Shoemaker (in *The Nature of Consciousness*, p. 503ff.), Thomas Nagel (in *ibid*, p. 519ff.), and Samuel Guttenplan’s introductory essay to *A Companion to the Philosophy of Mind* (Guttenplan, ed., Oxford: Blackwell, 1995: especially pp. 48, 82-86).

But those on the essentialist side argue with, I think, equal justification that many universals do not originate with humans at all. The word “anthill” may be our own, but what it refers to is not. Anthills are manufactured by ants, as is, too, the property of being an anthill. Without ants, such a reoccurring feature of nature would not exist. In other words, it is not just groups of humans that produce universals, it’s groups of other beings as well. And, as most physicists would argue, certain universals, like logical relationships (e.g., “1+1=2”) and certain laws of matter, do seem to be, indeed, true for all.<sup>16</sup>

In sum, in our everyday practical affairs, we generally treat the standpoint of the collective as a variable, not a constant. In some cases, it may correspond to all observers bar none. More often, however, it corresponds to a certain subset of observers, and what we call a “universal” is a product of that limited subset.<sup>17</sup>

With this modification in mind, the individual-collective dialectic shows up everywhere.

The distinction between individual and collective is built into our languages with the distinction between singular and plural. It arises in biological, zoological, anthropological, sociological, or political classifications of individuals into groups, whether they are types of cells, insects, or people. In the evolutionary process of natural selection, for example, individuals do not themselves survive; it is rather the group with its genome that is selected and survives. The important issue in evolution and in species characteristics is not the individual's nature per se, but the service of the individual's nature to the group as a whole.<sup>18</sup>

The distinction also appears in both the type-token and attribute-instance distinctions, which ground so much of philosophy of language. Both type and attribute refer to what typically

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<sup>16</sup> Some collections are temporal, with individuals being moments of time. The names that we call ourselves — “Linda,” “George,” “Jack,” and so on — do not identify just the here-and-now self. Even though we are very different people than we were at birth, such names identify a collection of here-and-now moments that span from birth to death tied together by such things as temporal continuity, memories, and DNA. That the collective standpoint needs to be flexible enough to encompass a time dimension is especially obvious in the Hindu-Buddhist debates over the reality of enduring beings (*ātman*). From the existentialist standpoint of the Buddhists, there are no enduring beings, only experiential presence.

<sup>17</sup> The sort of “universal” that I intend here is not one that is true for *all* occasions but rather true for a *certain given set* of occasions (which could, indeed, be all occasions). In this regard, I don’t find either “essence” or “universal” to be a particularly good word to use here. I do not mean an essence of a thing in the conventional sense of a defining, non-accidental feature; nor do I mean universal in the conventional sense of what is so for absolutely all observers. Rather, I mean the quality of being the same or “public” over a given collection of presences. Thus my preferred term, the one I have used elsewhere, is “public” or “publicity.”

<sup>18</sup> There has been considerable controversy going on among evolutionary biologists over the role of groups as a whole in the natural selection process. See, e.g., David Berreby, “Enthralling or Exasperating: Select One,” *New York Times*, 24 Sept 1996, Science Times section.



exists throughout indefinite extensions of individuals, while token and instance refer to one such individual.<sup>19</sup> Mathematics also depends on the individual-collective interrelationship. Much of formal logic and all of math can be derived from the primordial axioms of set theory, of which the dyadic relationship between set and member is primary.<sup>20</sup>

We find the distinction also in the way we do our empirical research — the way we seek to find “universals” among the “particulars” of direct experience. Then, too, we require the findings of one experiment to be confirmed by multiple experiments. Or again, we wait for peer reviews by several critics before we trust one person’s published conclusions. The difference between “practice” and “theory” breaks down along this line too, with practice concerned with the particulars of individual action and theory concerned with what is most generalizable over many instances.

In all these examples, fundamental concepts about our mental and physical worlds are informed by the individual-collective distinction. Single things appear in two ways: a word is both type and token; a set is a set as well as a member of other sets; experiential phenomena are both unique and orderly; a living creature is both an individual and a member of groups.

I want to spend the rest of my time looking at what I think is the clearest example of how the individual and collective standpoints generate paradox, namely, quantum mechanics. Not only is it a good example of presence-essence mutual exclusion, it also forces us to consider the possibility that certain defining features of awareness might also characterize subatomic particles.

As I mentioned briefly at the beginning of this paper, physics describes the regularities of quantum phenomena using two distinct pictures. One picture, Heisenberg’s matrix mechanics, begins with matter as particles; that is, it begins with the individuals (e.g., light as photons). The other picture, Schrödinger’s wave mechanics, begins with matter as waves; it begins with coherent collections of individuals (e.g., light as waves). On the face of it, these two pictures

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<sup>19</sup> The boundaries between attribute and instance and between type and token are not as clear as they sometimes are made out to be. A word token — a particular instance of the word “red,” for example, — is often thought of as persisting in time, as it does as a word printed on a page. But pages may wrinkle and ink may fade, and even the material composition of the printed word “red” changes slightly in the quantum shuffle of its material constituents. Such behavior illustrates how a token is better thought of as a temporal type that also obeys class logic.

<sup>20</sup> E.g., see Penelope Maddy, “Set Theory,” in *The Cambridge Dictionary of Philosophy*, 2<sup>nd</sup> ed., ed. Robert Audi, Cambridge: Cambridge Univ. Press, 1999, p. 837. Or Simon Blackburn, *The Oxford Dictionary of Philosophy*, New York: Oxford Univ. Press, 1994, p. 349.

contradict each other; yet, both the two views are necessary for a full account of material reality.<sup>21</sup>

But quantum physics illustrates essence-presence mutual exclusion in several other even more interesting ways.

For example, certain pairs of physical properties like location and momentum cannot be measured simultaneously to an arbitrarily high degree of accuracy without one measurement obscuring the other. This is Heisenberg's uncertainty principle.<sup>22</sup> This mutual occlusion comes not because we do not yet have the technical capabilities to do the measurements, but rather because of the very nature of our universe — of reality. What is especially interesting about these pairs of properties is that they appear to divide along *exactly* the same line that divides presence and the standpoint of the individual from essence and the standpoint of the collective.

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<sup>21</sup> Matrix mechanics or the Heisenberg picture is based on the mechanics of the interactions of discrete quanta; wave mechanics or the Schrödinger picture is based on the behavior of these particles as collectivities. The Heisenberg picture begins with the individual. Light is taken as composed of discrete quanta — photons — and the equations describe collective regularities in terms of the interrelationship of these quanta. The Schrödinger picture begins with the collectivity. Light is taken as a wave, as the collectivity of photons in their behavior as a unified phenomenon. These two pictures use two quite different sets of equations developed separately and later shown to be equivalent. In other words, not only does each picture depend fundamentally on matter being collectives of individuals, but the difference between the two pictures depends on the difference between the collective and the individual yielding two different views of physical phenomena.

Here is how an introductory physics textbook discusses the two pictures of quantum phenomena:

As Max Jammer has remarked, in his comprehensive study of the history of this subject, "It is hard to find in the history of physics two theories designed to cover the same range of experiences, which differ more radically than these two" — Schrödinger's wave mechanics and Heisenberg's matrix mechanics [Max Jammer, *The Conceptual Development of Quantum Mechanics*, New York: McGraw-Hill, 1966: page 271]. The former emphasizes the continuity of physical processes and the wavelike behavior of the electron — almost visualizable, despite the obscure meaning of the wave function. The latter proceeded from the discontinuity of physical processes, suggested by the observed discreteness of spectral lines, and regarded the electron as a particle, though without assigning it any definite space-time description in the classical sense. Nevertheless it was quickly discovered that the two theories are mathematically equivalent — the proof of this fact being given by Schrödinger and independently by Carl Eckart (at the California Institute of Technology) in 1926. (Gerald Holton and Stephen G. Brush, *Introduction to Concepts and Theories in Physical Science*, 2nd ed., Princeton: Princeton University Press 1985, pp. 495-6)

<sup>22</sup> This indefiniteness of matter is expressed as Heisenberg's uncertainty principle. Here is a textbook explanation:

Another way of characterizing the consequences of quantum mechanics is through Heisenberg's *indeterminacy principle* often called the uncertainty principle. In 1927, Heisenberg posed as a postulate that there are certain pairs of physical properties of a particle which cannot simultaneously be measured to an arbitrarily high degree of accuracy. The more accurately we try to measure one property in this pair, the less accurate will be our measurement of the other one. For example, if we try to determine both the position . . . and momentum . . . of an electron, then the product of the average errors or uncertainties of measurement . . . must be at least as great as  $\hbar/2\pi$  [where ' $\hbar$ ' is Planck's constant, an extremely small number]. (Holton and Brush, p. 497)

Take, for example, a moving particle's location and momentum. The location is a feature of the object's here-and-now, its presence. It is not a part of its enduring nature and says nothing about its location in subsequent moments. Momentum, on the other hand, says nothing about where an object is at the present time, but does give a quality that persists from one moment to the next. One measures location by finding the object in the spatiotemporal moment; one measures the velocity component of momentum by locating it in *more than one* spatiotemporal moment and presuming that the same object traverses the intervening time and space. Again, we cannot fully analyze one property — presence or essence — without obscuring the other.

Essence-presence mutual exclusion also reveals itself in a second, equally curious way. In what is called the "double-slit experiment," a stream of electrons is aimed at two side-by-side, narrow slits.<sup>23</sup> Because not only light but matter in general is both wave and particle in nature, the pair of electron beams emerging on the shadow side behaves like waves made out of particles. The image they create on a photographic plate exhibit the telltale pattern of wave interference.<sup>24</sup> Though this phenomenon is strange enough given that it is made by discrete particles, one can still think of this phenomenon as particles acting in concert as waves.

But when the stream of electrons aimed at the plate is reduced to just one electron at a time, several truly bizarre things occurs. First, even though there are no other electrons to interfere with, the pattern on the photographic plate *remains the same*. Each electron seems to be going through both holes at the same time (either that or each electron is interfering with other possible or virtual electrons). Second, and even more curious, if we look to see which hole the electron passes through, the pattern on the photographic plate *changes* to that of a non-wavelike particle! If the experiment is set up to record which hole each electron passes through, the electron stops behaving like a wave. The photographic plate no longer shows the wave's telltale interference pattern, but rather the pattern of a particle traveling through only one slit at a time.

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<sup>23</sup> Richard Feynman, one of the great teachers of physics and a Nobel Prize winner in his own right, regarded the double-slit experiment as central for understanding quantum mechanics because it revealed, in his own word, "a phenomenon which is impossible, *absolutely* impossible, to explain in any classical way, and which has in it the heart of quantum mechanics. In reality, it contains the *only* mystery . . . the basic peculiarities of all quantum mechanics" (quoted by John Gribbin in *In Search of Schrödinger's Cat: Quantum Physics and Reality*, New York: Bantam Book, 1984, p. 164).

<sup>24</sup> The interference pattern results from the fact that the waves originating from the two point sources are superimposed overtop each other. In certain places, two wave crests add together creating double-sized waves, while in other places a crest and a trough cancel each other out creating no wave at all. The effect is similar to that found on the surface of a pond when two rocks are dropped into the water a small distance from each other and at the same time.

Notice how well this experiment illustrates essence-presence mutual exclusion — how different and distinct the wave and particle pictures are. If we set up the experiment to look at the collective behavior of electrons, then that is what we see. If we set it up to look at their individual behavior, then that contradictory behavior is what we will see.<sup>25</sup>

I shall stop here with the curious behavior of subatomic reality. Nevertheless, it should be clear that the strange interplay of individual and collective at the quantum level closely parallels the individual-collective interplay behind the contemporary problems of consciousness. And this parallel suggests that human consciousness may quite likely be a variation on some primordial awareness theme played out on all scales of creation.

In any case, regardless of whether or not you find this continuity of creation plausible, I have offered considerable evidence that the current notion of pluralism needs amending. Clearly, essence-presence mutual exclusion is endemic to reality as we know it. Pluralism not only needs to emphasize the differences among metaphysical pictures as it does now; it also needs to emphasize the likelihood that these are different pictures of a *single*, shared mystery of ultimacy.

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<sup>25</sup> The problem I focus on here also has affected the progress of science. In the passage quoted below, note that the specific problem in this case is reconciling the difference between emphasizing “quanta,” that is, points of discrete presence, and emphasizing “strings” or that which is the same over a span of presences:

Points or continuum? Integers or real numbers? Discreteness or connectedness? How is the world constructed? How should it be described? The struggle between those opposing views is almost as old as physics, and it shows no sign of abating. In fact, many of the major milestones in the history of physics — and particularly in the history of the understanding of matter — were accompanied by a switch from one side to the other in the debate.

Early Greek philosophers taught that all matter is made up of one or more continuous substances: earth, water, air and fire. The atomic hypothesis, which substituted discrete point particles for continuous substances, was motivated in part by dissatisfaction with continua.

Fast-forward to 1926. Electrons are regarded as point particles orbiting a nucleus. From time to time they suddenly change orbit and emit or absorb a photon with a discrete frequency. The Austrian physicist Erwin Schrödinger decides to describe the process in the manner to which he is accustomed from classical physics, which deals with continuous motions through the space-time continuum. But the electrons apparently move discontinuously. As a way out of his dilemma he invents what he calls an “emergency exit”: wave mechanics. The makeshift element of the theory is a continuous wave function, which is not a real object at all, but merely encodes information about probable outcomes of experiments. Schrödinger hinted that what he felt to be unsatisfactory about his own theory might be related to the mismatch between reality and the artificial continuum of numbers.

In time, wave mechanics yields to quantum field theory, which fills the world with swirling, overlapping continua — one continuum for every elementary particle. ... Then quarks were discovered, and the image of the world was once more repainted in the pointillist manner. Now points are being replaced by continuous strings. (Hans Christian von Baeyer, “World on a String,” in *The Sciences*, September/October 1999, p. 13).

To a large extent, religions themselves already typically assert this idea: they claim to teach about a reality we all share and its apparent mystery. Indeed, in marked contrast to most science and philosophy, religions as a matter of course make room for mystery at the center of their metaphysical beliefs. Thus we have the nameless Brahman, the Dao that cannot be named, the empty throne of Yahveh in Jewish Merkavah mysticism, the mystery of the Christian Trinity, the *śāśvata-nirvāṇa* equation of Mahāyāna Buddhism — to name just a few. Religions specialize in describing the unknown in terms of the known.

What religions do not appear to do very often or very well, however, is acknowledge that the mystery of ultimacy they speak about is truly a mystery — a mystery beyond what can be fully captured by *any one* metaphysical account, *including* their own.<sup>26</sup> If nothing else, religions might take a lesson from science. Before quantum physics could move beyond its own exclusivist alternatives, it had to acknowledge mystery as *in fact* mystery, accept the contrary view as equally valid, and strive for a new way of seeing that accommodated both views.

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<sup>26</sup> It is important to notice the difference between an account of reality that is a new metaphysics and an account that show how different metaphysical views might complement each other. By showing how the Heisenberg and Schrödinger pictures complemented each other, physics did not do away with the different views. Physical reality is such that, looked at one way, one sees one picture; looked at another, one sees the other. This paper seeks to accomplish the same with certain metaphysical differences among religions. It does not propose a new, inclusivist metaphysics; it seeks to show how existing metaphysical paradigms might complement each other.