Satisfying Reality

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Abstract

It is claimed elsewhere that the conscious states of humans must have evolved together with their biological states, and that an ongoing interaction between the two must have occurred to insure that they mirror one another in any species. A quantum mechanical mechanism and an evolutionary model for the assumed mind/body interaction are described in those papers. The present paper outlines the related ontological and epistemological assumptions, showing how the claimed connection between conscious states and physical states should be understood.

Part I

My basic ontological assumption is that the universe is monistic. It is a fully unified whole that includes all that we call objective reality, and all that we call subjective reality, where there is no fundamental distinction between the two at this level. Moreover, I assume that there are no differences that are of fundamental or intrinsic importance to the monistic universe. There are of course differences, accounting for the great variety of things that we experience. Among these we find ‘significant’ differences, accounting for the fact that some become our guideposts for the rest. We find conserved quantities, (i.e., things that remain unchanged in time), and invariant quantities (i.e., things that remain the same under various kinds of displacement or transformation), and these become the constants that stabilize our lives. However, I do not think there is anything special about these quantities in the underlying monistic universe. They are special only to the part of nature that they themselves circumscribe. I therefore

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imagine that the fully inclusive universe is a seamless whole that contains all discernable differences, where none are intrinsic to the universe itself.

The above is a non-verifiable philosophical statement. An unfettered view of the monistic universe is not possible for humans, inasmuch as our knowledge is always based on significant distinctions of one kind or another. Experientially, we begin with highly selective images that comprise the foreground of our attention. We can certainly extend our imaginations beyond these specific gestalts by thinking logically about their content. But then, we become tied to a thinking process that relies on distinctions of a different kind - namely, those that elevate and reify the primitives and axioms of our logical construction. It is this property of ourselves in relation to the universe as a whole that prevents us from fully grasping it as a whole. The monistic universe has no capital landmarks; and so, we do not have a language, and will never have a language (mathematical or otherwise) to talk about it in its entirety. It’s as though we can see images of many kinds on a broad universal canvas, but the unifying canvas itself is not distinguishable in a way that makes it available in one piece to our intellect. The existence of such a canvas is therefore an unobservable and unprovable philosophical hypothesis. I nonetheless believe that it describes the final nature of our own universe.

**Framented Human Knowledge**

It follows that those parts of the universe that we can intellectually grasp are always fragmented and incomplete segments of the whole. Let these fragments be represented by areas such as A, B, and C in fig. 1, where the boundaries that separate one fragment from another are believed by us to be intrinsic separations. Important breakthroughs in our knowledge occur when, through some insight, the boundary between two fragments is removed or made irrelevant. For example, the boundary between A and B might be removed, making a larger fragment AB. Our knowledge would then be more inclusive. The boundary, which was previously seen to be an intrinsic difference between A and B, would continue to be a discernable difference, but it would no longer be intrinsic. It appears therefore that increasing inclusiveness and eliminating apparent intrinsic distinctions go hand in hand. Of course, the area AB would still be contained within a wider boundary, but the knowledge represented by this union would be more profound.

Furthermore, there will always be a wider boundary. However many boundaries are transcended by new insights, it is the nature of human knowledge that
there will always be new absolutes to articulate any new perspective. Experientially, a wider and more inclusive gestalt will always have a background that is not in the picture. Logically, a wider and more inclusive formalism always begins with newly proclaimed axioms and primitive terms that define the absolute or intrinsic boundaries of the new perspective. Gödel's undecidability theorem assures us that the new formalism, however general, cannot contain all of the true theorems in a universe of any complexity. Therefore, our knowledge, either experiential or formal, can never include the universe as a whole. Beyond this purely epistemological point, my ontological belief goes a step further to maintain that our monistic universe has no absolute boundaries of its own, apart from our inability to discover them.

Splitting the Whole

However satisfying or unsatisfying a monistic universe might be as a philosophical premise, it cannot serve as the basis of a usable ontology. We cannot launch an articulation of reality from a platform that is ineffable in principle. To proceed, we must create some arbitrary boundaries. I therefore divide the monistic universe into three categories: matter, form, and consciousness (see fig. 2). These, I believe, are the most significant ontological divisions that can usefully serve as a basis of human understanding. Penrose split the universe up in a similar way. In addition, the grouping of these ontological categories in fig. 2 allows a further epistemological division between the subjective world and the objective world. This is the Cartesian divide, and is essential to what follows.

The objective world in fig. 2 is a combination of matter and form. This is a part of the universe that is not directly accessible to our selves. The subjective world in fig. 2 is a combination of form and consciousness. This is the part of the universe that is directly accessible to our selves. Form is the common element. It is the link that we conscious beings have to the material world around us.
We have no direct knowledge of matter or the form that it takes; however, we do have a direct knowledge of consciousness and the form that it takes. Our basic epistemological assumption is that a correspondence can be established between the form that matter takes, and the form that consciousness takes.

Matter, form, and consciousness are such primitive ontological ideas that it is not possible to give them definitions independent of context. Like the primitives of a logical system, their meaning can only be derived from the way that they are used. However, an indication of intent is possible. I will say that consciousness includes perceptions such as sight, sound, taste, etc., and emotions such as fear, anger, and love, etc. I call these the elements of ‘pure consciousness’ when they are experienced in isolation. More generally, consciousness takes on a variety of forms when complex images and ideas are held in mind. It is through these images and ideas that we strive to portray the properties of the objective world.

The early pre-conscious universe of cosmology consisted of matter in one form or another. It does not make sense to imagine that the universe at that time possessed form alone. There had to be something that assumed the many forms that we study in cosmology, and I call that something matter. The form that matter takes is the subject of all of the physical sciences. I will also refer in this paper to pure matter, or formless matter, whose properties are not expressible in any formally structured science. I cannot explain what I mean by this until some further issues are clarified, and the idea is put to use in Part II.

The divisions in fig. 2 are arbitrary in the sense that they are unsupported by the monistic universe itself. Nonetheless, they are virtually inevitable to any notion of reality that acknowledges the existence of a world that lies beyond our separate selves, and is common to our many selves. This necessitates the recognition of two realms of reality, and a connecting link between them through which we can transcend ourselves to find the universe we share.
Subjective Formations

Beyond the emotions and bare sensations that pervade our lives, our experience is populated with many highly developed *images* of the things that we find in our subjective environment, such as tables, chairs, wine bottles, etc. These images have their origin in ordinary perception. By logical extension, we also constructed images of things that we do not (directly) experience, such as the atoms and molecules that are assumed to make up those tables and chairs and bottles of wine. Since these are not directly seen, they do not have their origin in ordinary perception. Instead, *constructed images* like these are formed in our imagination, in this case, in our scientific imagination. A third kind of subjective experience is an *idea*. This is formed when we discover a relationship between images and/or parts of images, or between constructed images and/or their parts.

These three formations are not clearly distinct from one another. Most images, and certainly those of the constructed variety, are permeated with ideas. However, it will serve our purpose in the next section to distinguish between things such as wine bottles (images), and their molecules and atoms (constructed images), and the physical laws (ideas) that govern their behavior.

Epistemology out of Ontology

The relationship between these subjective formations and the ontological categories in fig. 2 is shown diagrammatically in fig. 3. *Subjective images and ideas* are represented there by the three rectangles on the top row. Each is assumed to correspond to something equivalent to itself in the objective world, where these *objective things and relationships* (bottom row) are joined to their subjective counterparts by double lines called *rules of correspondence*. We are the ones who make the rules of correspondence, by virtue of the relationship that we assume exists between the objective world and our introspections about it. They connect the form that consciousness takes with the presumed form that matter takes.

Thus, I believe that our subjective concept of a bottle of wine (i.e., the cross-hatched rectangle at the top-left in fig. 3) corresponds to some such thing in the objective world (i.e., the cross-hatched rectangle at the bottom-left). I also believe that the subjective concept of an atom (i.e., the broken-cross-hatched rectangle at the top-center) corresponds to something having those same formal properties in the real world (i.e., the broken-cross-hatched rectangle
at the bottom-center). And I believe that our idea of momentum conservation (i.e., the gray rectangle at the top-right) corresponds to a law of nature (the gray rectangle at the bottom-right). The space on the top-right in fig. 3 is intended to represent pure (formless) consciousness, and the space on the bottom-left is pure (formless) matter.

My subjective image of a wine bottle might be an experience in black and white, or it might include a colorful label. However, it is only the formal features of any image (e.g., its shape) that can be set into correspondence with the objective thing. All of the characteristics of pure consciousness that Galileo would have called “secondary qualities” (e.g., its color), have no meaning in the objective world.

**Adequacy**

The subjective world in fig. 2 is not intended to be that of any particular individual. Individuals are not important here. If no conscious individuals existed, then of course subjectivity would not exist. But we split the universe into three parts, not 6 billion or more. Presumably there are as many images of a wine bottle in the universe as there are conscious wine drinking individuals. Each of these images will be given its own cross-hatched rectangle in fig. 3, and hopefully, each will correspond to an actual wine bottle in the objective universe. I believe that each of the image/thing or idea/relationship pairs in fig. 3 represents an attempt on the part of the universe to understand itself. It is ironic that a monistic universe should have trouble with such a seemingly dualistic
task - that of understanding itself. However, a failure to match pairs in fig.
3 does not constitute a contradiction on the part of the monistic universe, for
there is no reason why every subjective image that the universe creates should
correspond to something in the objective part of itself. No philosophical wine
drinker can be absolutely sure that the table, the chair, or the bottle he holds
is as objectively real as it appears. It is for this reason that we must continu-
ously test our subjective images and ideas for their adequacy in portraying an
objective world. Doing so is necessary to the long-term survival of a conscious
species, and the survival of such a species is necessary if the universe is ever to
understand itself.

**Part II**

The Ontological/Epistemological scheme in Part I will now be extended in two
ways. The first gives a more accurate account of the way that physicists in-
roduce matter into theoretical systems, and the second anticipates a possible
two-way involvement of consciousness with objective physical systems.

**Rules of Stipulation**

Newton’s physics may tell us how billiard balls behave, but it does not tell
us when and where to find billiard balls. Therefore, when defining a physical
system, a physicist must *stipulate* when and where material objects exist. He
quantifies the initial state of a billiard ball by giving its position, size, mass,
linear and angular momentum. The same kind of thing must be done when
specifying the initial state of an elementary particle in a quantum mechanical
system, but in this case, the *rules of stipulation* are different. The rules in this
case require one to fix the variables of a quantum mechanical state function.
For an electron that means giving its mass, charge, spin, and its probability
amplitude in configuration and momentum space.

The checkered rectangle on the top of fig. 4 represents any subjective image
or idea that includes a piece of matter. The objective world in that figure
contains the corresponding piece of matter in question, but we have unnaturally
divided that world into matter and form. Pure matter, represented by the black
square on the lower left, is therefore unnaturally separated from the form that it
takes, which is represented by the checkered rectangle in the lower center of the
figure. We repair this separation by connecting the two things with double lines
representing *natural associations*. The reason for this diagrammatic separation is given in the final paragraphs of this section.

The rules of stipulation are shown entering from the upper left in fig. 4. They are intended to be parallel to the natural associations of the objective world; but of course, they cannot terminate on anything to the left because they do not complete an association of any kind. They only appear in current theories to announce that a given state of matter exists at a certain time and place in our theoretical system. The declaration itself must be stated in the formal language of the theory, even though it represents missing information about pure matter. Figure 4 therefore embodies an amendment to our epistemological/ontological scheme that describes how matter is formally introduced into theoretical physics.

You might imagine that physics will one day have a theory that automatically includes a complete state description of all particles at any time in the history of the universe. That would seem to make rules of stipulation unnecessary. However, quantum mechanics can only predict probabilities. This means that an extra-theoretical rule of stipulation will always be necessary *after any measurement* in order to specify which of the possible results of the measurement is realized. Therefore, rules of stipulation are necessary to say how quantum mechanical particles survive measurement.

Here finally is the reason I give for the possibility of pure formless matter, and the diagrammatic separation within the objective world in fig. 4. Formalists and/or subjectivists might have objected to our ontological scheme from the beginning, claiming that the ‘matter’ category in fig. 2 serves no useful purpose; and that therefore, we who are confined to conscious awareness can get along without it. Surely they will say that the ‘pure matter’ referred to in fig. 4 is a fiction. However, one lesson of quantum mechanics is that there is no deterministic *form* that allows us to predict everything about matter that can be measured. We can predict probabilities over ensembles of measurements,
but we must resort to extra-theoretical rules of stipulation in order to specify the results of individual measurements. This need for rules of stipulation is a sign that ‘form’ fails to capture and embody every part of nature. Form succeeds in capturing and embodying ensembles of measurements, but strangely enough it fails at the level of the individual. Therefore, so long as we need rules of stipulation, the natural associations that parallel the rules of stipulation will serve the purpose of connecting that part of the objective world that can manifest itself in a predictable form, with the part that cannot.

Of course, we might one day abandon quantum mechanics and go back to a determinism that allows the results of a measurement to be known, or at least knowable, in advance. Such a theory might conceivably be so powerful that all rules of stipulation will be formally included in it. If that happens, then one might reasonably conclude that a separate ontological category of pure matter is not necessary. However, I do not believe that this will happen, for it is unlikely that classical determinism can be convincingly revived. Therefore, as matters now stand, matter stands apart from consciousness and form.

The Consciousness Connection

It is generally assumed that natural physiological processes within the body give rise to consciousness, even though no one can say how or why something like that should occur. Scientists generally believe that this consciousness is epiphenomenal. That is, they believe that the body can create and influence consciousness but that consciousness cannot influence the body. Accordingly, the mind/body influence is believed to be a one-way street.

William James challenged the epiphenomenal idea, saying that consciousness and matter must ‘interact’ with one another in order to satisfy the requirements of subjective evolution. He accepts the psycho-physical parallelism of von Neumann, which I interpret as the parallel relationship that exists between the various subjective and objective things in figs. 3 and 4. James says that such a parallelism would not be possible if the subjective and the biological states of a species did not actively engage one another during the time of their evolution. In particular, subjective states must have a consequence for biological states if there is to be Darwinian selection against a “wrong” subjective construction. Without feedback of this kind, subjective imagery would have developed independently of the underlying biology, so there would have been no evolutionary mechanism to keep subjectivity on a parallel course with objective reality. In these circumstances, the final emergence of a true parallelism would
be a miracle. Therefore, if we are to reject miracles, and accept the idea that subjectivity evolved along with everything else, and if we are to avoid a vacuous Berkeleian idealism, then we must accept von Neumann’s psycho-physical parallelism and acknowledge its origins in a Jamesean-like evolutionary feedback. It is for physics to discover the nature of this feedback and incorporate it into physical theory.

I accept and extend the argument from evolution in some recent papers, and speculate as to how a “consciousness-to-matter” influence might have come about. But apart from the particular mechanism of this influence, or the success of any particular speculation about it, we must provide for its epistemological possibility. The scheme in fig. 3 does not allow such an influence to take place in either direction. It portrays the objective world as a self-contained automaton that makes no authentic connection to the conscious world, except for rules of correspondence that may or may not work. A further modification of fig. 3 is therefore required.

Imagine that the brick-faced rectangle in the objective world of fig. 5 represents the body of a person we call “Harry”, and who we assume has a conscious life. In a monistic universe, Harry’s consciousness would not be artificially separated from his body; so his consciousness is related to his objective body in fig. 5 through natural stipulations, represented by the double line that comes into the figure from the lower right. This does not terminate on anything on its right because Harry’s associated consciousness is not included in the diagram. It is my belief that the stipulated influence goes both ways. Harry’s objective body exerts an influence on his consciousness (again, not in the diagram), and his consciousness exerts an influence on his objective body, as per the argument of William James. The mind/body interaction occurs here.

The brick-faced rectangle on top in fig. 5 represents an image of Harry’s body in the mind of an external investigator who is giving serious thought to Harry’s body and Harry’s experiences. The consciousness that the investigator associates with Harry’s body is represented by the small white square on the upper right, which is also in the mind of the investigator. Therefore, the upper brick-faced rectangle plus the white square constitute the investigator’s model of Harry’s mind & body. The model cannot show an intrinsic connection between these two things, so they are joined instead by bconscious associations

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1The psycho-physical parallelism of von Neumann resembles the pre-established harmony of Leibniz. For Leibniz, this harmony of correspondences between subjectivity and objectivity is indeed a miracle that is arranged by God. However, I say that it is a result of natural ‘monistic’ processes that find their way into human consciousness through the evolutionary mechanisms of natural selection.
that connect specific parts of Harry’s (theoretical) physiology to specific kinds of consciousness. These associations are “biconscious” because they paste together two alien things that are in the mind of the investigator: (1) parts of his physiological model, with (2) elements from his pure conscious awareness.

For instance, if the investigator believes that the color ‘red’ is associated with neurological events at a point in Harry’s prefrontal cortex, then he will make a biconscious association that goes from the prefrontal cortex of his physical model (top-center in fig. 5) to his own concept of pure red consciousness (top-right). An arranged wedding of red-with-brain is necessary because redness cannot be included in a formal theory of the kind entertained by theoretical physics, or theoretical physiology. This reflects a separation between form and consciousness that occurs within the subjective world. Biconscious associations are intended to run parallel to the natural stipulations entering the objective world in fig. 5, fulfilling the requirements of von Neumann’s psycho-physical parallelism. In the least, they parallel the one-way (epiphenomenal) influence of physiology on psychic states; but they also parallel the proposed two-way influence.

**Super Theory**

If a biconscious association is verified, it will be an empirical relationship that cannot be integrated into theoretical physics as that science is now practiced and understood. That’s because physical (or physiological) variables and psychological states are not commensurable. Physiological variables are connected to the objective world via vertical rules of correspondence; whereas psychological states exist in another part of the subjective world that is related to theoretical physiology via horizontal biconscious associations. Of course, psychological states might some day be expressed as psychological variables that are related
in a definite way to physiological variables; however, relationships like that do not presently exist. At the present state of our scientific understanding, consciousness can only be joined to physiology through biconscious associations; and this means that the connection cannot be organic.

It is possible in principle to find a theory of consciousness concerning relationships between psychological states. Presumably, such a theory would employ psychological variables that represent states of consciousness such as ‘redness’. These variables would then be related to their intended psychic states via rules of correspondence, not by biconscious associations. A theory of consciousness would therefore employ horizontal rules of correspondence that go from a theoretical construction like the upper brick-faced rectangle in fig. 5, to the conscious state that it represents like the white square in fig. 5.

Now imagine a super theory that combines our hypothetical theory of consciousness with physics. That would be a non-trivial unification of the two theoretical systems that establishes a functional relationship between their variables. Super theory would therefore require both vertical and horizontal rules of correspondence. It should be possible to reduce such a theory to: (1) a physics part that uses physical variables only, (2) a psychological part that uses psychological variables only, and (3) a part that establishes the functional relationship between the two kinds of variables. The latter would give us formal representations of the biconscious associations.

This would allow us to derive biconscious associations from a wider theoretical framework, and that would give us the only logical ‘explanation’ of their existence that we could ever expect. When Planck discovered his radiation law between intensity and wave length, no one concluded that wavelength thereby ‘caused’ intensity, or that intensity ‘caused’ wave length, or that anything at all was ‘explained’ by this empirical formula. It was not until Einstein’s photon theory provided a logical context for Planck’s formula that it was possible to believe that it was thereby explained. Only then could a causal pathway be derived from the basic theory to the Planck formula. Similarly, the discovery of biconscious associations should not lead one to conclude that certain physiological configurations ‘cause’ psychological states, or that psychological states ‘cause’ physiological configurations, or that anything at all is thereby ‘explained’. Explanations and causal pathways will exist only if a wider theory such as the above super theory allows one to derive the biconscious associations

\footnote{Correspondences are much stronger than associations. A psychic state can only be loosely associated with a physiological configuration, whereas it can be set into full correspondence with a theoretical variable that is intended to represent it in some (now non-existent) theory.}
in question. This will be true independent of the possible one-way or two-way influence of these associations.

**QMod**

Suppose that a modification of quantum mechanics is found that produces the collapse of a state function, and embodies physical mechanism that fully explains the evolution of von Neumann’s psycho-physical parallelism. I will call such a modified theory QMod. If furthermore, the physiological site of this modification is also the site of a subjective experience that does not have an interactive influence on QMod, then it would seem that an epiphenomenal theory of consciousness is again indicated. In other words, if QMod can account for a state reduction and the psycho-physical parallelism in a self consistent and self contained way without making explicit use of conscious states, then consciousness would again appear to be a non-participant as it has been since the time of Newton. However, QMod suffers the same disadvantage as any epiphenomenal theory. It may be able to explain the workings of a material system without the help of consciousness, but it cannot explain the co-appearance of consciousness itself. Only a super theory can hope to explain the conscious states that are associated with a material system. If that happens, if a super theory were to prove successful, then consciousness and matter would become partners in our understanding of nature, and an epiphenomenal interpretation would lose all significance. In the end, epiphenomenalism remains an impoverished way of looking at QMod or any purely mechanical system that is (tentatively) at the forefront of theoretical construction.

A super theory of the kind described above is far beyond anything that is currently possible, and may never be realized at all. Therefore, we should not try to explain consciousness at this point. Instead, we should concentrate on more limited objectives such as discovering the material circumstances in which consciousness appears, and finding the biconscious associations that chronicle the evolution of the psycho-physical parallelism. The latter is what the author attempts to do in refs. 5 and 6.

**Incompleteness and a TOE**

When physicists speak about a Theory of Everything (TOE), they are not concerned about including pure consciousness or formless matter into some grand
theoretical scheme. They are only concerned with those things that are contained within the ‘form’ part of the universe (i.e., the overlapping subjective and objective worlds in fig. 3 that are joined with rules of correspondence.) Presumably, such a TOE would cover the physical and biological sciences, economics, sociology, and behavioral psychology, as well as all other ‘departments’ of objective knowledge. Many physicists believe that physics already includes all of this knowledge in principle. I take this to mean that they believe that the laws of physics can be put into an axiomatic form such that all objective laws or relationships that are found in nature and in human affairs are included as theorems. I do not believe this to be possible. One obvious objection comes from Gödel’s undecidability theorem, which tells us that no finite set of axioms can successfully derive all true theorems in a complex universe containing discrete variables.

Certainly a TOE of the kind envisioned by physicists can be closely approached, even if it is never fully realized. Further unification in physics is surely possible, and is the source of great motivation in such areas as string theory. But human knowledge is essentially fragmented and incomplete as has been said. However inclusive our understanding of nature, it will always be contained within a boundary that excludes something else. In particular, pure consciousness and formless matter are excluded in the kind of TOE that is pursued in physics.

The super theory postulated above represents an even wider theoretical aspiration - one that breaks through the bounds of the Cartesian divide between the objective and the subjective worlds. It imagines a formalism that significantly includes variables from both worlds, a feat that may never be realized. But even if something like this is achieved, it will surely be bounded in such a way as to exclude some other part of reality. Again, Gödel’s undecidability theorem places limitations on a formalism of any complexity that contains discrete variables; and that stricture applies to our super theory as well as the any unified theory of physics. The theorem represents a purely formal limitation on any TOE or super TOE.

But more than that, we know that super theory excludes formless matter. As previously explained, matter must be introduced into physics by stipulation because of the quantum mechanical unpredictability of many of its numerical values upon measurement. This means that no formal theory, however broad, can include that part of reality. The measured “eigenvalues” of matter will always have to be stipulated extra-theoretically so long as quantum uncertainty is integral to physics.
The Choices

In the best of all worlds, we humans would be able to fully comprehend the monistic universe. However, I do not believe that this is possible for mortals of this world. We can certainly talk about a monistic universe and speculate about some of its holistic properties as we have done in this paper. But it is not possible for us to put any particular thing (e.g., a wine bottle) into a full monistic context. That’s because the universe is not circumscribed by intrinsic boundaries that allow us to comprehend it. To get a handle on wine bottles and their like, we are forced to introduce arbitrary boundaries that are useful for that purpose.

The boundaries we introduced appear in figs. 2 and 3. They first divide the universe into three ontological categories, and then split it into two epistemological parts. One of these parts includes that which we conscious beings know to exist, and the other is that which we can only imagine exists. This division of reality has a demonstrated utility, for it has served as a basis for accumulated knowledge since the early seventeenth century. At the time, Descartes’ separation of mind and body was put to use in Galileo’s distinction between primary and secondary qualities. Without this distinction, science as well as most other fields of knowledge would not have advanced much beyond their medieval state.

There are certainly other choices that could be made. We might try to limit ourselves to a purely subjective ontology, as positivists are prone to do; or, we might claim that there is no significant separation between the subjective world and the objective world, as some realists are prone to say. Both of these choices attempt to mend the Cartesian divide as though the monistic universe is fully available to our intellects. However, I do not think it is available in this way.

Perhaps the super theory, if it were realized, would suggest another way of splitting up the universe. Because its rules of correspondence seem to ignore the Cartesian divide by radiating in both horizontal and vertical directions, super theory might suggest novel ontological and/or epistemological ways of introducing distinctions into a monistic universe. That is certainly a possibility, although it is not one that can be seriously entertained in the absence of a well-defined super theory. My belief is that the boundaries in fig. 2 will survive in any case. The separation between that part of the universe that we directly know (i.e., the subjective) and the part that we can only imagine (i.e., the objective) is much too fundamental an epistemological distinction to be cast aside. Descartes is likely to prevail at the epistemological level no matter what happens. Furthermore, the ontological distinction between pure consciousness
and the form that it takes is hard to deny, not to mention the need to recognize the existence of formless matter that is likely to remain outside of any theoretical system. It is for these reasons that I believe that the categories and divisions in fig. 2 are, and will continue to be, a practical starting point for any scientific ontology and epistemology.

Our theories can only be related to something else by means of either rules of correspondence, or rules of stipulation, or biconscious associations. I have not made a point of this, but even the subjective relationships between our images and our constructed images are established by rules of correspondence. For instance, only a rule of correspondence can connect a theoretically constructed meter stick with the visual image of a meter stick that we experience in the laboratory[3]. This is the original meaning of a rule of correspondence introduced by Margenau (ref. 2), for whom direct experience is the ultimate reference for any theoretical activity. In such a purely subjective context, von Neumann’s psycho-physical parallelism can only point to the similarity that exists between our images and our theoretical constructions, and this creates a problem. James’s evolutionary logic could not have begun by mediating between images and constructions alone, for there is no reason why either of these should have existed prior to a time of their Darwinian emergence. They would have served no purpose prior to that time. Therefore, subjective evolution could not have begun within a purely subjective ontology. It could not have gotten started without an external taskmaster that makes ‘realistic’ survival demands of some sort on the evolving subjective states.

Copenhagen

The Copenhagen interpretation of quantum mechanics embraces a subjective philosophy, for it is claimed that we can no longer assume the existence of an objective world. Heisenberg’s uncertainty principle is often cited as the reason for this confinement to subjectivity. That principle tells us that there is something incomprehensible about nature because we cannot express the theoretical state of a physical system in terms of classical variables to any degree of precision. We are forced instead to introduce probability as an intrinsic property of the system. It is this rather strange feature of quantum mechanics that is said

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3Constructed images of meter sticks not only include atomic or molecular models, but they also include the elongated rectangles that we drawn on a blackboard to help solve problems in kinematics. They include any cognitive attempt to represent something by abstracting from it, or by elaborating upon it.
to refute the idea of ‘objectivity’. However, it only refutes the idea of ‘classical
objectivity’.

From the beginning of this paper I have accepted that there is something
incomprehensible about nature. I believe that we humans can only go so far
in understanding the whole. But that has not prevented me from positing the
existence of an objective world, which “lies beyond our separate selves, and is
common to our many selves”. Nor does it prevent me from creating theoretical
models that are consistently related via rules of correspondence to something
that I believe to have similar formal properties in the objective world. To this
end, one need only accept intrinsic probability as a primitive variable in quantum
mechanical systems. It is clear, therefore, that Copenhagen physicists were not
forced to give up the objective world. They chose to do so, citing the demise of
classical objectivity as their reason.

If quantum mechanics tells us anything that is epistemologically novel, it is
that we will always need “rules of stipulation” to specify the state of a particle
that survives quantum measurement. These are extra-theoretical statements
that specify the actual measured values of intrinsic probability distributions.
A Copenhagen theorist would say that these stipulations are the principal evi-
dence of the claimed incomprehensibility of nature. I agree, but I would put
it differently. I cite these rules as evidence that there is a part of the objective
world (namely, pure-formless matter) that cannot be included in our theoretical
system. Only the ‘form’ that matter takes can be theoretically included. Rules
of stipulation therefore point to a part of nature that we cannot describe. They
do not say that there is no other part of nature.

And finally, as stated in the previous section, a completely subjective ontol-
ygy cannot give an evolutionary account of its own emergence. There is no place
for bare subjectivity to begin. It would have to be born whole. Consciousness
cannot emerge in bits and pieces, without another (external) reality to mediate
the process - selecting pieces that fit into a survival pattern of the species, and
discarding pieces that don’t fit. Evolution implies building piece by piece in
this way, and biological evolution requires an unforgiving environment to be
the womb of this process. Psychological evolution requires no less. With the
Copenhagen approach, as with all subjectivist philosophies, subjective states
lack an adversarial environment of this kind to rub against. And this implies
the miraculous emergence of a full-blown and fully consistent psychic life, or
possibly, a more gradual unfolding of serendipitous match-making between the
bits and pieces of psychic life.
Revealing Universals

For one reason or another, I believe that we will never have a fully complete theory of everything. It is probably an insight like this that has led Post Modernists and others to abandon the quest for a common universal knowledge and a common universal understanding, choosing instead to go down a separatist path. If human knowledge is fragmented and incomplete, these philosophers invite you to choose an incomplete fragment that best fits your temperament, and become a partisan of your own truth and your own reality. Not only is this advice drearily contentious, but it doesn’t follow. It is true that any reality we choose will be an incomplete fragment of the whole. But not all fragments are equal. There is a highly principled choice between broad-based fragments that reveal universals, and those fragments that are narrowly provincial and/or merely self-serving. Only the broadest principles of unification can bring us close to the common canvas that underlies all of our diverse human experiences. We may never apprehend that canvas in an absolute sense, but the closer we approach it, the greater is our reward. Those insights that are most inclusive and least dependent on intrinsic difference are those that will bring us the greatest intellectual and esthetic appreciation of things. Not only do they lead away from partisan disputation, but they stress the universals that most nearly and most beautifully reflect the underlying harmony of our universe.

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