

Whitehead's Postmodern Cosmology

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Our world once resonated with 'sympathies' and 'correspondences' – an unseen web of interconnections and harmonies linking macrocosm and microcosm through the great chain of being. Medieval philosophers lived in such a world, a world where the guiding paradigm was 'organism:' a world pulsing with life and significance.

That all changed with the advent of modernism, particularly with Descartes's radical division of nature into mind and insentient matter. Together with Bacon's emphasis on sensory empiricism, it was a relatively short step to the Newtonian worldview guided by the paradigm of mechanism, where all that was real was determined by physical data detected by our physical senses.

In previous chapters, we saw that sometime around the middle of the twentieth century the limitations of the modernist worldview became critical, particularly when the shortcomings of logical positivism and behaviorism were finally recognized. These limitations became even more acute as a result of discoveries associated with relativity theory and quantum physics.

One reaction, sometimes called 'deconstructive postmodernism' was to acknowledge the inadequacy of reason, philosophy, and science to give us a coherent and final answer to cosmological questions such as the nature of reality, of matter, and of mind. The best we could hope for, according to this view, is to 'deconstruct' our ways of thinking and talking about the world, and to be content with conceptual relativism, that all our knowledge must necessarily be determined by our linguistic, social, historical, and cultural contexts. There is no 'reality' says this deconstructive postmodernist view; there is, rather, a multiplicity of 'realities' depending on our context and perspective.

However, the same set of circumstances that led to the decline of modernism prompted an altogether different reaction, known as 'constructive postmodernism' (Griffin, 1998; Griffin, et al. 1993). According to supporters of this view, the failures of the modernist project – which resulted in the crises in philosophy, science, and society noted earlier – reveals the need for a deep shift in our conceptions and perceptions of the world. To move beyond the pathological schisms of modernism to a true postmodernism, we need a radical revision of our ontology and cosmology. We need a vision of nature in which all parts of the ecological-cosmological system are innately meaningful, in which sentience or experience is all pervasive, resulting in a profound sense that the world is itself sacred. The postmodern program, according to this perspective, is for us to develop a new science, a sacred science, in which meanings, values, purposes, and consciousness itself are integral.

The two forms of postmodernism could hardly be more different. Yet they share a common root in the bankruptcy of modernism, with its stated ideal of certain knowledge about the world. When Locke, followed by Hume and then Kant, showed that neither empiricism nor rationalism, nor both combined, could guarantee certain knowledge, that our minds could never know the world as it is in itself, philosophy retreated from the grand scheme of metaphysics, ontology, and cosmology, into epistemology. If we couldn't know the world, then at least we could investigate the instrument of knowing that has failed us. Following Kant, who is sometimes regarded as the first or seminal postmodernist, the primacy of epistemology was established. The study of how we know took precedence over what we know to exist.

What is interesting about both forms of postmodernism today is their different reactions to epistemology and its failure to achieve certainty. On the one hand, the deconstructionists decry the futility of epistemology because it can never provide a firm foundation for certain knowledge; therefore, we should leave aside all questions about how we can know mind and matter and concentrate on the contexts of our linguistic utterances. On the other hand, the constructive postmodernists, also recognizing the impossibility of a secure and certain epistemological foundation, declare that therefore this is all the more reason for reinvigorating our efforts at creatively constructing coherent systems of ontology and cosmology.

If we can propose a coherent cosmology, or 'likely story' as Plato called it, one that includes the storyteller within the story itself, then we may begin to understand the relationship between the knower and what is known, between how we can know anything at all about the world and the necessary nature of the world itself. We would have a worldview that accounts for the possibility of *any* Worldview – a world intrinsically knowable because it is a world that intrinsically knows.

Furthermore, in such a cosmology the implicit shift is not merely to a comprehensive account of *how* and *what* we know, but also – when the profound participatory relationship between knowing and being is fully engaged – to a deep inquiry into who knows. Inevitably, a rigorous and disciplined investigation of the relationship between knower and known involves a transformation of the investigator. And although such transformation typically involves non-rational and nonsensory ways of knowing, postmodern philosophers in the tradition of Whitehead recognize the vast potential of reason itself to reveal the nature of the world and of ourselves.

Cosmology First

The speculative process philosophy of Alfred North Whitehead is perhaps the most rigorous attempt at constructing such a postmodern cosmology. For Whitehead, cosmology or ontology is primary. He avoids the 'foundationalist' epistemological ideal of modernism: First deciding how we (can) know, before deciding what we (can) know.

Whiteheadians reject the irrationalism of the deconstructionists. Although they agree that we cannot have the certainty the modernists hoped for (and sometimes claimed), that is no excuse for falling into nihilistic relativism, and a rejection of all metaphysics. On the contrary, they declare that we are, therefore, liberated to use our rational faculties creatively. Instead of avoiding ontological and cosmological questions altogether, we can and should – creatively construct coherent and internally consistent systems of thought and continually question the inevitable assumptions underlying these systems.

This, says Whitehead, is the true rationalism: the rigorous and creative application of reason to the most profound ontological, cosmological questions – even though we may never (indeed, will never) finish the project. And if we begin this work, as we must, from within the modernist paradigm, we will sooner or later realize that radical changes have to be made if we are to truly move into the proposed new postmodern paradigm. Foremost among these, according to Whitehead, are:

A deep and rigorous rational questioning of assumptions underlying conceptual expression of all experiences, including the nature of the experiencing entity itself;

Development of a realist ontology that acknowledges the existence of a real world;

Development of a realist ontology that contains within it an adequate account of experiencing subjects – i.e., subjectivity and experience are real;

Development of a rational realist ontology/cosmology that accounts for self-causation as well as efficient causation (i.e., accounts for the relationship between freedom and determinism);

Development of a realist cosmology that accounts for ontological interdependence and wholeness, while at the same time accounting for 'individuals';

Development of a rational realist cosmology that accounts for purposive organisms and mechanical, determined relations between objects;

Development of a process cosmology where 'events:' not 'things:' and relations and relata, not separate objects, are fundamental. Such a cosmology would account for the ontological relationship between process and substance, between subjectivity and objectivity.

In the latter phase of his long career, Whitehead laid out a detailed program for a new speculative philosophy in which he thoroughly addressed these criteria. I have already addressed the first of these: a rational questioning of assumptions in philosophy, science, and society. Central to Whitehead's approach to cosmology is an explicit emphasis on the application of reason. It may never get us to a final answer, but we should always look for how we can apply it to bring us to a more coherent understanding of the world and of our place in it.

And the first task of reason, according to Whitehead, is to assent to the reality of the world with a conviction

and commitment that reason can give us knowledge of it as it is in itself – if only ever provisional. This, of course, flies in the face of Kant's monumental critique of reason, and his 'Copernican revolution' in philosophy that unambiguously affirmed the impossibility of our ever knowing the nature of the world as it is in itself (including the knower). Whitehead emphatically disagreed, and he was not shy about criticizing Kant for leading philosophy badly astray for two hundred years. He frequently stated that his task was an attempt to return philosophy to its pre-Kantian glory (Lucas, 1989). There is a real world, and we *can* know it, says Whitehead, just as our common sense presupposes. However, he does not advocate naive realism that unquestioningly accepts reality as it appears to our senses. It is the job of philosophy and science to identify mere appearances and to examine or bypass them to get at reality itself.

Whitehead's radical proposal was that we need to be bold in our ontology such that it would lead to an epistemology by which we could know reality in itself, and not just the appearances constructed by our categorizing minds. His solution was to propose that the fundamental nature of the world is not materialist 'substance:' nor Cartesian dual substances of matter and mind, nor Berkeley's mind-only idealism. The world is not composed of 'things' but of 'events:' or processes – which he called 'actual entities. This was a significant departure, though not entirely without antecedents in the history of philosophy, as we saw in the previous chapter. Even as far back as the fifth or sixth century B.C.E, Heraclitus (c. 540-480 B.C.E) in Presocratic Greece, put forward the notion that 'all is change'; and dialectical change was central to Hegel's metaphysics in the early nineteenth century. But what was radical in Whitehead's proposal was the assertion that nature's fundamental 'events' were experiencing subjects – 'actual occasions of experience.'"¹

In his major work of speculative philosophy, *Process and Reality*, Whitehead develops a highly detailed and original cosmology based on his ontology of experiencing events. His system makes such a radical break with modernist assumptions that he often found it necessary to coin new words and to introduce unfamiliar notions to explain his ideas. For this reason, reading Whitehead can sometimes be a little like learning a new dialect. But the reward is well worth the effort.

Begin with Experience

For instance, one of his novel approaches to speculative philosophy and to laying a foundation for a new science was to begin with human experience as a way to understand the structure and operations of the natural world. Of course this may not seem so novel at all to anyone familiar with Descartes's method. For Descartes, human experience – in fact his own consciousness – was the starting point. But whereas Descartes went on from there to develop a philosophy in which human experience was fundamentally different from all other things in the natural world, Whitehead develops a cosmology in which all of nature is composed of experiencing entities. By extrapolating from human experiences as natural events, he drew analogies to explain even subatomic events as natural 'occasions of experience.'

I will introduce some of Whitehead's key ideas (and also give a flavor of some of his unusual phraseology) in this chapter and develop their implications further in the next two chapters.

Understanding Whitehead

Understanding Whitehead is both very simple and very challenging. It is simple because the essence of his cosmology can be summed up in a few straightforward sentences:

Events not 'things.' The essential nature of reality is not material substance – it is organisms in process. Very simply: process, not substance, is fundamental.

Nature feels all the way down. Universal process is necessarily sentient – it unfolds by feeling. Thus what we call 'matter' and 'mind' (both abstractions) are derived from fundamental actual events that are inherently experiential.

Fundamental interrelatedness. All events are mutually co-creating. They interfuse and interpenetrate each other so that it is a fallacy to speak of the reality of any actuality as an isolated, self-contained entity.

Whitehead is very challenging because he works out these three core ideas in great detail in a number of books – including *Science and the Modern World*, *Modes of Thought*, *Adventures of Ideas*, and, particularly, *Process and Reality* – often using new language to explain complex concepts. Part of the difficulty is because his core ideas run counter to the cosmology and metaphysical worldview that have prevailed in Western thought for nearly four centuries. In fact,

one element of this worldview – the notion of substance – has dominated Western thinking since the time of the Pre-socratics. We are born into certain habitual grooves of thought that no longer work for the postmodern cosmology offered by Whitehead. The whole thrust of our thinking needs to radically shift if we are to successfully work with Whitehead's ideas.

In short, then, Whitehead's worldview can be difficult to grasp because it requires a new way of thinking about the universe and its contents. Our language is dominated by spatial metaphors – even our attempts to talk of time are often phrased in spatial terms. Yet it is precisely the *temporal* aspect of reality that is central to Whitehead's philosophy, and that we need to focus on. Our language is noun oriented, whereas the world that Whitehead describes is verb oriented. For instance, instead of cosmos – understood as a vast, perhaps infinite, expansion of space populated by innumerable galaxies, stars, and planets, and all the objects they contain—we would begin thinking in terms of 'cosmosing' – a vast, perhaps infinite, network and hierarchy of interrelated events, where all 'objects' are in reality the coming into being and fading away of energetic patterns-within-patterns, self-organizing cascades of creativity, converging pulses of *sentient energy*.

Whitehead challenges the notion that the world is divided up into two kinds of substances: those that are sentient, that feel, that have subjectivity or consciousness, and those that are insentient, are unfeeling, are wholly objective and are without consciousness or experience. As we've seen, this dichotomy is modernism's legacy from Descartes, who, in separating mind from matter, said that only minds can feel and think and know, and that matter is wholly devoid of feeling or capacity for knowing. By separating mind and body, Descartes set in place a couple of dualisms: (1) the basic dualism of mind and matter, and (2) the derivative dualism of sentient matter and insentient matter. Since according to (1), only minds can feel, any instances of bodies that feel (such as humans) must therefore have an additional mind or soul that animates them. Whitehead's second core idea rejects both of these dualisms.

On its own, the idea that all matter—that nature through and through – is blessed with feeling, with a capacity for experience, is not at all difficult to grasp. We may or may not accept such a view, but either way it is easy enough to understand. It is the other core idea – of fundamental process – that begins to make Whitehead's philosophy such a challenge. The challenge deepens even more when we realize that Whitehead's metaphysics is based on a profound insight that the three core ideas are deeply and intimately interwoven: Not only is the world composed of interdependent events, Whitehead is telling us, but these events are themselves intrinsically experiential. How can an event be a locus of experience! Or, put another way: How are feelings connected with process?

Whitehead's philosophy is an attempt to work out a solution to this question. A fourth core idea, then, and the most challenging of all to the modernist paradigm, is that *fundamental process is inherently experiential*. Process and feeling are connected because in order for one moment, now, to be related to the immediately previous moment, past, and to the immediately subsequent moment, future, the 'now' moment must feel (or 'prehend') aspects of the past by including them as constituents of its own actuality; and to give something of itself to the next, future, moment.

This is the essence of Whitehead. The connection between process and experience, between events and feeling, is his alternative to what he terms the 'fallacy of simple location' The phrase 'simple location' is an example of what is both easy and challenging about reading Whitehead. On its own, we probably have little difficulty grasping what the phrase means: A thing is simply located where (and when) it is, and not somewhere else. This desk, for example, is in this room and not partially upstairs. This cup is on this table, and not in the dishwasher. My body is sitting in my chair, and not in yours. But behind the simplicity of the phrase 'simple location' and Whitehead's critique of it, lies a profound and revolutionary philosophy. Unpacking this, and many other apparently innocent phrases, such as 'actual entity' or 'eternal object:' opens a metaphysical Pandora's box – and in Whitehead's hands out flies a virtual lexicon of neologisms.

A good place to start with Whitehead, therefore, is to identify some of his more unusual concepts and begin to unpack them. This is not always an easy task, because as Whitehead wrote he did not take the time to clearly explain his new terminology, and because any single new term often presumes many of his other new terms. However, we can make a start. The following is a list, of ideas taken from *Science and the Modern World* (SMW) and *Process and Reality* (PR) that are crucial to even a basic understanding of Whitehead's philosophy. (Many of these concepts appear in pages 103-105 of SMW. The core of Whitehead's metaphysics is right there in those three pages.)

Substance: That which exists by itself.

Simple Location: A thing just is where it is, and nowhere else.

Fallacy of Misplaced Concreteness: Confusing abstractions with concrete actuality.

Prehension: 'Taking account' of something at-a-distance.

Events: Happenings over time – embracing past, present, future.

Fundamental interrelatedness: Every event is related to every other event.

Actual entity: That which is. What actually exists. What is really real.

Eternal objects: Changeless forms, the ultimate ingredients of all events.

Internal relations: Each relationship enters into the essence of the event. Apart from that relationship, the event would not be itself.

Epochal process: Processes come in whole units – pulses of self-creation and perishing.

Organicism: Ah concrete enduring entities are organisms: the whole influences its parts (its various sub-organisms) that come together to form it. Part-whole relationships are mutually determining. An alternative to mechanism.

In clarifying what Whitehead meant by these terms, I will use his words where I think they are clear, and where not, I will offer my own clarifications. I'll begin, not with a Whiteheadian neologism, but with a word that figures centrally in his work because he is committed to providing an alternative.

Substance

Substance is that which exists by itself: In ordinary talk, we use 'substance' usually to mean 'solid stuff' – and if not solid, then definitely 'stuff' of some sort. We mean it much the way we use the word 'material.' It is what the world or its contents are made of. Substance, then, tends to mean 'matter' or 'energy' – the fundamental *substrate* of real forms and qualities.

But this is not the formal meaning of substance in philosophy, as described by Descartes in his *Principles of Philosophy*, for instance: 'By substance we can conceive nothing else than a thing which exists in such a way as to stand in need of nothing beyond itself in order to its existence' (quoted by Whitehead in SMW p. 144). Technically, substance refers to that which can subsist by itself, and needs nothing else to sustain its existence. For example, left to itself, a lump of matter such as a stone, would continue to exist for all eternity. The stone is an instance of substance. But substance need not refer to solid or spatial 'stuff' like stones, or even to less dense 'stuff' such as energy. As Descartes argued: Non-spatial mind, or 'thinking stuff' can exist on its own; it does not depend on a body for its existence. Thus, for Descartes, both matter and mind were substances.

Whitehead not only objects to the notion of substance as material substrate, he argues against the notion of substance in its strict philosophical sense. Common sense would seem to suggest that the ultimate nature of the universe must be that it is self-sufficient – it must be self-sustaining, it must be substantial. Otherwise, it would depend on something else, and so would not in fact be ultimate. This line of reasoning leads quickly to an infinite regress – 'turtles all the way down.' So, it would seem, there *must* be substance of some sort at the bottom (or highest), ultimate, level of reality.

Whitehead disagrees – and he does so for two reasons. First, he says that there can be no such thing as a wholly self-sustaining ultimate. There may be an ultimate – in fact, he insists *there must be an ultimate* to avoid infinite regress – but this ultimate is not self-sustaining. The ultimate is not a substance. And this is because of his second reason: By itself, the ultimate is an abstraction, it can have no meaning apart from its particular instantiations. *Actual reality* is a process of interchange between what Whitehead calls 'eternal objects' (see below), and 'actual entities' (see below). Eternal objects may exist at the level of ultimate reality, but this is not actual existence – it is 'existence' only in the form of pure potentiality. Eternal objects can be expressed only as ingredients of some (or many) actual entities.

Thus the ultimate is interdependent with some, many, or all of its actual manifestations. Neither ultimate eternal objects, nor limited and determined actual entities, are self-sufficient. They are wholly dependent on each other, and so are not substances. They are, instead, processes because the relationship between eternal objects and actual entities is one of act or acting. The eternal objects 'ingress' into (become ingredients of) actual entities that come into being through the 'coming together' (or 'conrescence') of eternal objects passed on from previous, completed actual occasions.

There is no substance because nothing exists by itself: The world is a network in time and space of interconnected and interpenetrating processes. Whitehead: 'There are no single occasions, in the sense of isolated occasions. Actuality is through and through togetherness' (SMW, p. 174). And, 'Each volume of space, or each lapse of time, includes in its essence aspects of all volumes of space, or of all lapses of time' (p. 71).

Simple Location

A thing just is where it is, and nowhere else. Closely interwoven with the notion of substance is the 'common-sense' belief in simple location. It follows that if something can exist wholly by itself, then at *any time* and at *any place* that object remains *wholly itself* in that place, at that time. In other words, it is simply located in time and space).

According to this view, real objects are extended in space *by necessity* for if they did not occupy space (e.g. numbers) they would be abstractions. But, from this perspective, real objects need not be extended in time. The passage of time for any object is an *accident*. It is something that happens to the object, but is not an integral part of its essence the way space or volume is.

Thus, according to this notion of simple location, an object can be wholly itself at any instant of time (where 'instant' means without duration). It doesn't need time to exist. Take any slice of time, no matter how small, and the object is still there wholly itself. On the face of it this seems to make sense. If I watch my cup for a minute, it is still exactly and wholly the same cup as it was an hour ago. If I watch it for a minute, or a second, or a nanosecond, the cup doesn't change.

Whitehead disagrees with all of this. First, that any object is simply located in space, and second, that it is simply located in time. He says that every object is the result of a process whereby aspects of the universe converge ('concesce') to become that object. Thus, the 'object' is really a process extended over distances that involve the entire universe.

Furthermore, it also has to be extended over time. If it were possible for an object to exist wholly as itself at any instant, then the question arises: How could it be the same object the next instant? If it is wholly itself at an instant, then no part of it can extend to either the previous instant or to the subsequent instant. It would be wholly a *different* object from instant to instant. So what would account for the apparent continuity from instant to instant of what we take to be a self-identical object? How, for instance, could you be the same person that woke up this morning as the one who went to sleep in your bed last night! Without some connection between instants – that is, without some extension from moment to moment – you could have no memory of what happened even a split second ago. Without extension in time there could be no self identity. Whitehead:

To say that a bit of matter has simple location means that, in expressing its spatio-temporal relations, it is adequate to state that it is where it is, in a definite region of space, and throughout a definite finite duration of time, apart from any essential reference to the relations of that bit of matter to other regions of space and to other durations of time. (SMW, p. 58)

... the concept of simple location is going to make great difficulties for induction. For, if in the location of configurations of matter throughout a stretch of time there is no inherent reference to any other times, past or future, it immediately follows that nature within any period does not refer to nature at any other period.... For there is nothing in the present fact which inherently refers either to the past or to the future. It looks, therefore, as though memory, as well as induction, would fail to find any justification within nature itself. (SMW, p. 51)

Fallacy of Misplaced Concreteness

Confusing abstractions with concrete reality. According to Whitehead, both the notions of substance and of simple location are examples of 'misplaced concreteness.' To account for the idea of substance or of simple location, we need to abstract the object from its embeddedness in the process matrix of space-time. It is not wholly untrue to say that an object exists at a particular place – and for practical purposes we can (and do) behave this way. But the full truth of the situation is that the 'object' is embedded in a flux – a flux of events that are creating that 'object' at that location, for that duration. Beyond that, the 'object' has no real existence. It is merely an abstraction from the flow of the whole.² A helpful way to picture this is the way a tornado forms. It is nothing more than a concrescence of meteorological events, swirling cones of wind. Yet we even give it a name. The tornado looks like a thing – we can point to it, measure it, and see its devastating effects – but in essence it is just rapid, patterned movements of air. It emerges from the flux of weather events, has its own particular form, moves across the landscape, and eventually releases its

energy and dissolves back into the flux from which it arose.

Prehension / Concrecence

'*Taking account*' of *at-a-distance*. What we call 'objects' are really the focal points – or 'gatherings together' of events – of processes streaming in from the universe. Whitehead calls this streaming together the act of 'concrecence.' But this coming together is not merely a receptive, passive affair. The focal entity actively selects from the innumerable, if not infinite, possibilities streaming its way – otherwise, there would be no way of explaining why one 'object' or event should differ from any other. Yet all actual entities are individuals, they are distinct.

This act of selection is what we call 'perception' at the level of human organisms. It is a 'reaching out' and 'taking account' of what is distant in space and time) from the actual entity occupying this point here in space at this moment now. This 'reaching out' is not unique to humans, nor even to animals. Whitehead extends the concept, calling it prehension, to all actual entities all the way down. He quotes Francis Bacon to clarify his point:

[Francis Bacon said] 'It is certain that all bodies whatsoever, though they have no sense [i.e., cognition] yet they have perception [uncognitive apprehension].' I construed perception (as used by Bacon) as meaning taking account of the essential character of the thing perceived, and I construed sense as meaning cognition. We certainly do take account of things of which we have no explicit cognition.... I will use the word prehension for uncognitive apprehension.... Accordingly, there is a prehension, here in this place, of things which have a reference to other places. (SMW, p. 69)

And he continues:

This unity of a prehension defines itself as a here and a now, and the things so gathered into the grasped unity have essential reference to other places and other times. For Berkeley's mind, I substitute a process of prehensive unification. ... Note that the idea of simple location has gone. The things which are grasped into a realized unity, here and now, are not the castle, the cloud, and the planet simply in themselves; but they are the castle, the cloud, and the planet from the standpoint, in space and time, of the prehensive unification.... It is, therefore, aspects of the castle, the cloud, and the planet which are grasped into unity here. (SMW, p. 69)

With this understanding, Whitehead introduces his notion of 'sense-object': 'An entity of which we become aware in sense perception is the terminus of our act of perception. I will call such an entity a sense-object.... I will say that a sense-object has ingression into space-time' (SMW, p. 69).

Whitehead here is proposing an epistemology that avoids the lurking skepticism in Galileo and Locke's distinction between primary and secondary qualities. Whitehead makes no such distinction; instead, he embeds sense objects in the domain of space-time. The prehension of a particular sense-object (e.g., colour green, or sound of a note – previously, a 'secondary' quality) follows the 'ingression' (the becoming an ingredient of) into space-time of that sense-object (making it what previously would have been called a 'primary quality').³

Events

Events are happenings over time and space – embracing past, present, future. They enfold the past, mirror the present, and anticipate the future. Whatever is prehended (or perceived) is always an event. Whitehead:

An event is the grasping into unity of a pattern of aspects. The effectiveness of an event beyond itself arises from the aspects of itself which go to form the prehended unities of other events. (SMW, p. 119)

The word event just means one of these spatio-temporal unities. Accordingly, it may be used instead of the term 'prehension' as meaning the thing prehended. (p.72)

Fundamental Interrelatedness (Nexus)

Everything (every event) is related to everything else (every other event):

My theory involves the entire abandonment of the notion that simple location is the primary way in which things are involved in space-time. In a certain sense, everything is everywhere at all times. For every location involves an aspect of itself in every other location. Thus every spatio-temporal standpoint mirrors the world. (SMW, p. 91)

The holographic character of Whitehead's organicist worldview echoes Buddhist descriptions of the fundamental interrelatedness of all beings. In both, the overall impression is of a cosmos mirroring itself in all its parts, a

hierarchic cosmos in which every entity is partly created and sustained by every other. Compare this quote from Whitehead,

A non-materialistic philosophy of nature will identify a primary organism as being the emergence of some particular pattern as grasped in the unity of a real event. Such a pattern will include the aspects of the event in question as grasped in other events, whereby those other events receive a modification, or partial determination. There is thus an intrinsic and an extrinsic reality of an event, namely, the event as in its own prehension, and the event as in the prehension of other events. The concept of an organism includes, therefore, the concept of the interaction of organisms. (SMW, p. 103)

with the following, where the cosmic ecological balance is caught, for example, in the *atvatamsakka* sutra in the imagery of Indra's net, and in the *jijimurge* doctrine in Zen Buddhism:

In the heaven of Indra, there is said to be a network of pearls, so arranged that if you look at one you see all the others reflected in it. In the same way, each object in the world is not merely itself but involves every other object and in fact is everything else. (Charles Elliot, *Japanese Buddhism*)

All things are One and have no life apart from it; the One is all things and is incomplete without the least Of them. Yet the parts are parts within the whole, not merged in it; they are interfused with Reality while retaining the full identity of the part, and the One is no less One for the fact that it is a million-million parts. (Christmas Humphrey, *Buddhism*)

In both Whitehead's philosophy and in Eastern mysticism the 'parts' of the cosmos are not independent bits of matter, they are organisms creating and being created by their environment. In a purely mechanical universe, where all things happen due to outside disturbances, the only reality is extrinsic – where all things are related externally as configurations of independent substances. Ah internal relations (see below) – interiority, experience, or consciousness – are squeezed out of existence.

In *Process and Reality*, Whitehead uses the term 'nexus' to point to a distinctive node in the network of universal relationships streaming and interpenetrating into each other: '[A] nexus is a set of actual entities in the unity of the relatedness constituted by their prehensions of each other' (PR, p. 24). Thus, what in normal language we might refer to as an 'individual' (you or me, for instance), Whitehead describes technically as a 'nexus' of unified dynamic relationships.

Actual Entity

That which is. What actually exists. What is really real. It is not sufficient, metaphysically, to simply say that an actual entity is what actually is, for although that defines it, it does not begin to identify it. To know that something is, is one thing; it is something else to know what that thing is – i.e., 'what that is which is' (Leclerc, 1965). Whitehead:

'Actual entities' – also termed 'actual occasions' – are the final real things of which the world is made up. There is no going behind actual entities to find anything more real. They diner among themselves: God is an actual entity, and so is the most trivial puff of existence in far-off empty space. But, though there are gradations of importance, and diversities of function, yet in the principles which actuality exemplifies all are on the same level. The final facts are, all alike, actual entities; and these actual entities are drops of experience, complex and interdependent. (PR, p. 18)

Although Whitehead here says that what is ('the world') is 'made up' of actual entities, seemingly implying that it is made up of some underlying substance, later, he is quite explicit that 'an actual entity is a process, and is not describable in terms of the morphology of a 'stuff'" (PR, p. 41). The very being of an actual entity is that it acts, it 'becomes itself' its becoming constitutes what it is. In short, an actual entity is wholly a process of coming into being – an actual entity is the act of existing. Beyond the process of coming into existence, there is no actual existence. Thus, the world is 'made up' of actualities in the sense that they are its dynamic ingredients. Its own process is what creates the world from moment to moment to moment; universal process is the fundamental constituency of all reality. Without act, no actuality; without process, no actual existence. And this underlies Whitehead's famous ontological principle:

'Actual entities are the only reasons; so that to search for a reason is to search for one or more actual entities' (PR, p. 24).

Eternal Objects

Changeless forms, the ultimate ingredients of all events. In the discussion of actual entities the emphasis is on actual existence – implying that there may be some other kind of existence that is not actual, that does not involve change, or process. And, according to Whitehead, this is the case. Some objects exist but do not have actual existence; they exist potentially. But their being potential does not diminish their importance in the scheme of things, for without them no actual entities could exist. The reverse is also true: No eternal objects could exist in the absence of actual entities.

But what exactly is an 'eternal object'? What are examples of something that is 'eternal' and in what way are they 'objects'? Whitehead gives as examples of eternal objects: 'colours, sounds, scents, geometrical characters.' They are what in classical and medieval metaphysics were called 'universals.'⁴ Where an actual entity is a particular, an eternal object is a universal. Socrates is an example of a particular human; humanity as such is an example of a universal. Each human is a particular exemplar or instantiation (or manifestation) of universal humanity. Without humanity, there could be no individual humans; without individual humans, there could be no humanity. Particulars participate in universals. Whitehead's eternal objects, therefore, are akin to Plato's Forms, in that all mundane things – actual entities – derive their reality or actuality from participating in universal forms. But unlike Plato, and like Aristotle, Whitehead's 'forms' (eternal objects) cannot exist independently of, and transcendentally to, at least one (and probably numerous) instances of particular actualities. Actual entities and eternal objects require each other for their existence. Whitehead:

This interfusion of events is effected by the aspects of those eternal objects, such as colours, sounds, scents, geometrical characters, which are required for nature and are not emergent from it. Such an eternal object will be an ingredient of one event under the guise, or aspect, of qualifying another event. There is a reciprocity of aspects, and there are patterns of pattern of aspects. Each event corresponds to two such patterns; namely, the pattern of aspects of other events which it grasps into its own unity, and the pattern of its aspects which other events severally grasp into their unities. (SMW, p. 103)

And later:

We conceive actuality as in essential relation to an unfathomable possibility. Eternal objects inform actual occasions with hierarchic patterns... Every actual occasion is a limitation imposed on possibility, and ... by virtue of this limitation the particular value of that shaped togetherness of things emerges. (SMW, p 174)

Internal Relations and Value

'Each relationship enters into the essence of the event. ' For Whitehead, every actual entity is constituted by a set of internal relations – meaning it derives its very being, its essence, and its value from the relationships between the various prior actual entities and eternal objects that stream into it from the past in each moment. Without these constitutive internal relations, nothing actual would exist. Reality, therefore, is essentially both relational and interior. Furthermore, these relationships are felt or prehended. The only way for a set of internal relationships to endure from one moment to the next is for interiority to be experiential – to literally feel the presence of the past. Internal relations, then, account for the experiential interiority, or subjectivity – the 'what it feels like from within' – of every actual entity or event all the way down. Whitehead:

Each relationship enters into the essence of the event; so that, apart from that relationship, the event would not be itself. This is what: is meant by the very notion of internal relations. It has been usual, indeed universal, to hold that spatio-temporal relationships are external. This doctrine is what is here denied. (SMW, p. 123)

All entities are not of equal value. The hierarchical depth of internal relations experienced by any particular entity (from humans and dolphins, to amoeba and bacteria, to electrons and photons) is the relative value of that entity within its hierarchical network. For instance, a cell is more valuable than a molecule or an atom, and a dog or fish more valuable than a single cell, because it literally incorporates more reality, more complex nesting of levels of internal relations. Quite simply, because the fish and the dog unifies its multiplicity of constituent cells, molecules, and atoms (exemplifying downward causation), whereas the reverse is not true, they have, or are, greater value. On this analysis, downward causation (e.g., instances of creativity from mind to brain) is more valuable than upward causation (e.g., instances of mental activity determined by events in the brain). Whitehead:

An actual event is an achievement for its own sake, a grasping of diverse entities into a value by reason of their

real togetherness in that pattern, to the exclusion of other entities.

This really means that each intrinsic essence, that is to say, what each eternal object is in itself, becomes relevant to the one limited value emergent in the guise of the event. But values differ in importance. Thus, though each event is necessary for the community of events, the weight of its contribution is determined by something intrinsic in itself. (SMW, p. 104)

Whitehead identifies this 'something intrinsic' as a property he calls 'retention:' or 'endurance:' or 'reiteration.' Value, therefore, is graded, hierarchical. It depends on the hierarchical depth of self identity. Value is the 'recovery' in a later entity of the self-identity from a prior entity. The more of the layered spatio-temporal hierarchy of organisms that contributes to this self-identity, the more value that organism-as-a-whole has. Value, then, is the mirroring of internal relations. It is the mirroring of the self-identity of the whole in its parts, and of the parts in the whole:

There is the same thing-for-its-own-sake standing before you. Thus the event, in its own intrinsic reality, mirrors itself, as derived from its own parts, aspects of the same patterned value as it realizes in its complete self. It thus realizes itself under the guise of an enduring individual entity, with a life history contained within itself. (SMW, p. 104)

Epochal Process

Processes come in whole units – pulses of self-creation and perishing. Reality consists of pulses or vibrations of patterns of process that transition from one event to the next.

No duration can become until a smaller duration (part of the former) has antecedently come into being ... [leading to] the Aristotelian view there is no first moment ... an irrational notion.... [This] difficulty is met by conceiving temporalization as the realization of a complete organism. This organism is an event holding in its essence its spatio-temporal relationships (both within itself, and beyond itself) throughout the spatio-temporal continuum. (SMW, p. 127)

Whitehead is proposing an alternative to both the notions of time or process as atomic, and time or process as continuous. If time is atomic – i.e., composed of self-contained instants or moments – it raises the difficult problem of accounting for duration and self identity for the experienced fact that something gets carried over from one moment to the next (e.g., the sense of self). If time is continuous, an equally difficult problem arises, as Zeno's paradoxes demonstrate: If moment A is continuous with a subsequent moment B, then one part of B (B_a) must be closer to A than another part of B (B_c) which is closer to the next moment C. But this must also be true of B, (and of B_c): A part of B_a call it B_1 , will be closer to B_a than to B_c . Continuity of process leads to an infinite regress, which logically prohibits any process from ever occurring. There could be no transition from one moment to the next.

Whitehead recognized the difficulties with both the atomic and continuity notions of process. Unwilling to accept the alternative of Parmenidean static changelessness, he proposed a version of process that combines both atomicity and continuity. He said that as soon as an event comes into being (as a concrescence of eternal objects), it completes itself – it perishes. Process, therefore, is epochal – i.e., it is an 'epoch' with a beginning and an end. But before it perishes, it passes on its essential actuality to a subsequent event. Process, therefore, is also a succession of epochs. Actuality, in Whitehead's view, is more like the process of a movie which is a sequence of individual frames – except for a fundamentally important difference: Unlike movie frames, epochs interpenetrate and pass on part of themselves (their 'form' or 'eternal objects') to the next epoch.

Organicism

All concrete enduring entities are organisms: The whole influences its parts (downward causation of its various sub-organisms) that come together to form it. Part-whole relationships are mutually determining. Parts determine the whole, but not completely – for wholes inject novelty or creativity into the system of parts. The whole always adds something to the sum of its parts. Mechanism cannot account for creativity in relationships, and thus organicism offers a more comprehensive, postmodern, alternative to the mechanistic materialism of modernism.

The doctrine which I am maintaining is that the whole concept of materialism only applies to very abstract entities, the products of logical discernment. The concrete enduring entities are organisms, so that the plan of the whole influences the very characters of the various subordinate organisms which enter into it. In the case of an animal, the mental states enter into the plan of the total organism and thus modify the plans of the successive subordinate organisms until the ultimate smallest organisms, such as electrons, are reached. Thus an electron within a living

body is different from an electron outside it, by reason of the plan of the body. (SMW, p. 79)

But where does consciousness come in?

Whitehead then goes on to make a very curious statement: 'The electron blindly runs either within or without the body'; (p. 79) (emphasis added). This seems to exclude electrons from the community of purposeful, experiential entities, thus contradicting the panpsychist position of experience all the way down; even though in the next sentence he says: 'But it runs within the body in accordance with its character within the body; that is to say, in accordance with the general plan of the body, and this plan includes the mental state.'

This last statement acknowledges that the 'mental state' is intrinsic to the organism of the body, but, it seems, not to the electron. The electron's character is affected only by the body's mental state, not by any mentality intrinsic to the electron itself. Whitehead, here in *Science and the Modern World*, seems to be offering organicism as a more cautious alternative or preliminary model to the more explicit panpsychism in his later work, notably *Process and Reality*. In *Science and the Modern World*, there still seems to be some ambiguity or hesitancy on Whitehead's part regarding mentality or experience as intrinsic to prehension all the way down. If electrons 'blindly run,' it is hard to square this with their engaging in prehension that includes sentience and volition.

In fact, on the next page, Whitehead says that his lectures amount to 'the theory of organic mechanism'. In this theory, the molecules may blindly run in accordance with the general laws, but the molecules differ in their intrinsic characters according to the general organic plans of the situations in which they find themselves' (SMW, p. 80). Although the theory of 'organic mechanism' is a significant advance on mechanistic materialism (based on the notion of simple location) because it can account for the 'presence of the past' and an 'orientation toward the future' in the present actual occasion, it is still 'flatland' theory.

Like contemporary systems theory, the 'organic mechanism' of *Science and the Modern World* cannot account for the depth or interior dimension of experience or subjectivity in the world. Unless the fundamental constituents of organic systems – let's say electrons or quanta – are themselves intrinsically experiential, then any theory of 'organic mechanism' or systems theory can account for mentality (i.e., subjectivity, experience, sentience, volition) only as an emergent property. But, as we've seen, such 'emergence' of an ontologically novel phenomenon requires a miracle that begets the 'wine of consciousness' from the 'water of the brain' (as Colin McGinn put it). Any explanation in which 'a miracle then occurs' fails as an explanation. Like systems theory, organic mechanism seems to call for a miracle to account for consciousness.

The Structure of Experience

But by the time Whitehead produces his magnum opus *Process and Reality*, he has developed an ontology in which each 'occasion of experience' is a momentary unit of subjectivity – and although indivisible, it has an internal dynamic structure or process. This structure results from the fundamentally time-based nature of experience. Every experience always occurs 'now'; in fact, our only direct experience of time is through moment-by-moment experience (we have no sense organ for time, we are aware of it extrasensorily).

Each 'occasion of experience' is a dipolar unity, or a non-dual duality, that enfolds, or prehends, the past (objects) into the present (subject), and orients the organism toward the future in a 'creative advance.' Each 'occasion of experience:' therefore, consists of past moments flowing into the present. That is, the present experience feels the past experience through 'physical prehension' for example, through somatic cellular activity (Whitehead calls this 'perception in the mode of causal efficacy').

Some occasions of experience, those with sense organs – such as eyes, ears, noses, taste buds, touch receptors, sonar, and radiation receptors – also receive information from objects in the world through the mode of 'perception in the mode of presentational immediacy' Whatever the source of its prehensions, each 'occasion of experience' synthesizes the feelings of the world out of which it arises, and unifies them in a 'creative advance' – a subjective orientation or projection toward the future.

One of the most significant consequences of Whitehead's ontology – his transcending the Cartesian split – is that experience, our entire epistemology, is rooted in the matter of our body. We know the world (and ourselves) by feeling how it impresses itself upon our bodies. What we ordinarily call 'sense data' are not the beginning of our knowledge. They are, rather, the end products of 'long and highly complex selection and amplification, by the particular physiology of the human body, of elements of the external world entertained in the mode of 'causal efficacy'

(Lucas, 1989, p.148). Feeling in the mode of causal efficacy corresponds with unconscious somatic experiences of the world as it literally enters into us. Perception in the mode of presentational immediacy corresponds with knowledge of the world as it is filtered through our sensory-cognitive systems. In this sense, perception in the mode of causal efficacy is extrasensory, and though intuitional, is still necessarily bodily based.

One consequence of Whitehead's worldview is that in his epistemology familiar sensory perception (presentational immediacy) is derivative of a more fundamental extrasensory perception or feeling (causal efficacy). Whitehead says:

The irresistible causal efficacy of nature presses itself upon us ...and we are left with the vague feelings of influences from vague things around us... Our bodily experience is primarily an experience of the dependence of presentational immediacy upon causal efficacy. (PR, p. 176)

Psi Phenomena

Among the events that a human occasion of experience prehends are the constituent events of its body's cells, molecules, atoms, and elementary particles. In other words, even subatomic events enter into the flow of momentary experiences unconsciously felt by the person (and may conceivably rise to conscious awareness). Even quantum events can influence the 'subjective form' of our moment-by-moment experience. And given the non-local nature of quantum events, what is prehended need not be located within the person's own body. Therefore, given Whitehead's naturalistic view of experience, extrasensory phenomena involving action-at-a-distance, such as telepathy and clairvoyance, are no longer problematic (Griffin, 1997). Furthermore, just as human experience may prehend quantum events, it is equally consistent to suppose that subatomic events may include among their prehended internal relations the influence of human experiences. In other words, physical events 'external' to the body of the experiencing human, may prehend or feel and respond to human experiences in ways consistent with the data of psychokinesis. Data supporting psi phenomena ... pose some of the most troubling challenges to modern science rooted in the metaphysical assumptions of objectivity, sensory empiricism, reductionism, determinism, and mechanism. Psi phenomena simply do not fit into the conceptual and theoretical boxes shaped by modernism. The result: Typically, the modern scientific mind refuses to accept psi data (or even to seriously look at the evidence), dismissing all such claims as 'irrational' and either methodologically flawed or fraudulent. But such blanket rejection is itself a symptom of irrationalism and scientism.

Entrenched scientific irrationalism should not surprise us, however, if Whitehead's radical analysis of the roots of modernism is correct.

Whitehead's Reassessment of Modernism

Whitehead takes issue with the idea that modernism is distinctive by its emphasis on rationality as a move away from the supposed irrationalism and superstition of the premodern medieval 'Age of Faith.' In stark contrast to, even in contradiction of, the orthodox view Whitehead argues that modernism is characterized by a move toward irrationalism – hence the characterization of deconstructionism as a brand of 'late-late modernism' and not true post-modernism. How can we account for two such opposing views?

From the orthodox perspective, as we have seen, modernist rationalism begins with Descartes's philosophical method as a reaction to the authoritarian medieval paradigm. Whitehead, on the other hand, sees the origins of modernism from the perspective of the scientific emphasis on empirical method. According to Whitehead, by focusing so diligently on the observed and measured particularities of nature – the reductionist program – science broke with the previous premodern scholastic preoccupation with the application of intellect and reason for thoroughgoing study of scripture and theological exegesis. To support this view, he cites, for example, Father Paul Sarpi's *History of the Council of Trent* where in 1551 the Papal Legates decreed that the Italian School of Divinity ought to use the 'authorities of the Holy Fathers' and not to 'use reason' (Whitehead, 1975; Cobb, 1993). This decree was described as a 'novity' as a novel introduction that ran counter to the prevailing rationalism of Thomas Aquinas, St. Bonaventure, and other Scholastics. In other words, the use of reason had long been a tradition within the medieval community.

Whitehead, then, is telling us that the break with medieval Scholasticism, which the birth of modernism represents, is a move away from rationalism. This move, as already noted, was toward Baconian empiricism and the consequent reductive methodology of determining the causal relations between parts. Modernism, then, as characterized by Whitehead, is a program of empirical investigation of efficient causality; and this emphasis, in turn, gave rise to the modernist paradigm of mechanism. But mechanism claims far more than it can justify either empirically or ra-

tionally (as we soon will see). The move toward empiricism characteristic of modern science is, in fact, a move away from rationalism.

Whitehead acknowledges that this move toward empiricism, reductionism, and mechanism was necessary for modern science to make the immense progress it has. But it did so at a cost – by ignoring or dismissing the possibility and actuality of self-causation (Aristotle's final causation), of the entire domain of subjectivity and the causal efficacy of experiencing subjects.

Despite Descartes' championing of rationalism and modernism's rejection of rationalism in favour of Baconian empiricism, Whitehead still recognized Descartes' major role in the origin of modernism. But Descartes' major influence on science was not his rational methodology, as is usually supposed. It was his mind-matter dualism that resulted from the application of this method. The focus within science was on the consequence of Cartesian rationalism, not on the rational method itself.

Fledgling modern science took up the Cartesian split, the fragmentation of mind and matter, and applied this program of fragmentation and separation first by focusing exclusively on just one component of the Cartesian split – matter – and second by further fragmenting and separating the domain of matter into constituent parts. This move represented the Newtonian extension of Cartesianism and Baconianism: the reduction and fragmentation of the world machine (without mind) to its mechanical parts (Cartesianism) by rigorous empirical observation and inferred causal relations between the parts (post-Baconianism).

The move away from rationalism, according to Whitehead, was propelled further by David Hume and Immanuel Kant. First, Hume, through his defence of empiricism in *An Inquiry Concerning Human Understanding* (1748), demonstrated that causality could never be an object of empirical observation. He argued, rightly, that if empiricism depends on data detected by the senses, then since we have no sense for detecting causal relations tall we can observe are successions of 'conjoined events'), we cannot build a science or philosophy on an understanding of the world as a system of causal relations. Understanding is limited to the data of sense perceptions, and causal mechanisms do not qualify as such.

Hume, thus, presented a devastating critique of the notion of causality by demonstrating that if all our knowledge is gained through our senses, then since we have no sense organ for detecting causality, all notions of causality are merely inferences, not true empirical knowledge. Causality, therefore, should have no place in an empirically based science. All our senses can give us are regular sequences or succession of events. We can know that one thing comes after another, but not that one thing 'causes' another. We never actually see that happening.

This was a major problem for the modernist worldview that assumed science could and should be wholly empirical (meaning based on sense perception), a view that assumed data gained by this method could, and had, revealed the universe as a network of (efficient) causal relationships. This was Newton's and Laplace's basis for the idea of the world as a machine. Hume's critique undermined that notion: If science was empirical (which it was), then it could give us no knowledge of causality and therefore of mechanism. Without mechanism, no explanation. Without explanation, no science.

Second, Kant attempted to rescue philosophy and Newtonian science from Hume's critique of rational understanding, in his masterful *Critique of Pure Reason* (1781). In the *Critique*, Kant argued that the ultimate task of philosophy was to turn the function of reason onto the structure and operations of the rational instrument itself. The purpose of this project was to discover the outer limits of reason. Kant concluded, in the final analysis, that is all that reason, philosophy or science could do: to know the instrument of knowing, not the world as it is itself. Kant's extreme irrationalism, according to Whitehead, was to propose that reason could never tell us anything about the real nature of the world. In this way, Kant may be regarded as the arch idealist or anti-rationalist. However, Kant's major project following Descartes, Berkeley, and Hume, was to overcome the dichotomy between idealism and realism. His compromise solution was to propose that there is a real world in-itself, distinct from our perceiving, categorizing, rational minds (Kant's extreme Cartesianism) – but that we can never know it as it is in itself. All we can know, said Kant, are our empirical *a posteriori* constructions that are shaped by our innate *a priori* mental categories, such as space, time, quantity quality, and relation. Reason gives us these 'constructions' as the data by which we know the phenomenal world. The world behind these phenomenal appearances, the transcendent noumenal world, is forever beyond us. Reason, in other words, is not adequate to the task of giving us true knowledge of the real world. This extreme anti-rationalism of Kant and Hume persuaded the academic world of philosophy and science that the business of the human mind was not to understand the nature of the real world as such (metaphysics and ontology), but

rather to be content with epistemology, and with describing the world of appearances as detected by our senses and instrumentation. In other words, the business of philosophy was to become, eventually, analytical philosophy and linguistic analysis, not metaphysics, while the business of science was empirical observation, precise mathematical description, and empirical testing of hypotheses based on these descriptions. This, according to Whitehead, was the essence of the modernist move. And this is what he challenged (see Cobb (1993) for a more detailed analysis of Whitehead's critique of modernism). Not surprisingly, Whitehead regarded Kant's Critique as the major culprit in the modernist's recoil from rationalism and metaphysics. The task of philosophy and science after Kantian modernism ('postmodernism' is not a term used by Whitehead) is to restore rationalism so that we can have a meaningful metaphysics and cosmology. In the postmodern world envisioned by Whitehead, reason would be able to connect us with an accurate (if necessarily always incomplete and provisional) understanding of the world as it is in its concrete relations, not simply mere descriptions of appearances.

Causality as Feeling

Whitehead argued that the problems of Kantian-inspired modernism were derived from the Cartesian error, and could be resolved by a combination of unorthodox moves – including a redefinition of 'matter' or of the so-called objective world, and by an expansion of the notion of causality.

First, objects are – by conventional definition – 'not subjects.' According to Descartes, human beings are the only experiencing subjects in the natural world. And, as Hume demonstrated, relations between objects are only ever perceived as a succession of before and after. There can be no observation of influence of one object acting on another. Ah notions of causality are, instead, derived from our own experience of actually felt influences – Whitehead's 'perception in the mode of causal efficacy. The only actual instance of influence or causality is what we experience in our bodies or through the effect of our past experience on our present experience (Cobb, 1993).

This is a crucial insight. It means, as John B. Cobb observed, that all other meanings of causality are derivative from this experience or else vacuous. Either the relation between successive events in the subatomic world is analogous to the relations we experience, or we have no way of thinking of them at all. Whitehead proposes that before we lapse into total silence we try out the hypothesis that there are analogies among all events. (1993, p. 176)

And not just in the subatomic world: Wherever we assume causation, we can understand it only if we assume that there is some analogous experience taking place whereby at least one of the entities involved feels the influence of one or more other objects. For causality to be real anywhere in the world, then, subjectivity must exist there, too. This is just one example of how Whitehead applies rational analysis within his complex speculative cosmological system to support his initial ontological assumption of panpsychism. The internal coherence of his metaphysics is itself a demonstration of the usefulness of reason that he advocates. By making a case for panpsychism – or pan-experientialism (see next chapter) – Whitehead has offered a postmodern resolution to the major issues in the philosophy of mind inherited from the modernist paradigm. Specifically, his panpsychist ontology opens the way for a resolution of the perennial mind-body problem by proposing a relationship between psyche and physis as two temporally ordered poles of the one experiencing individual entity. The interaction of mind and matter become a relationship between events, or 'occasions of experience:' where through the natural process of the flow of time, subjects (minds) become objects (physical matter). The missing link in the perennial mind-body problem, it turns out, is time.

Notes

1. And even here, Whitehead was clearly impressed by the emphasis on fundamental process and experience in Henri Bergson and William James. In fact, the list of philosophers, scientists, and other scholars prior to Whitehead for whom the notion of evolution-sometimes extended to evolutionary cosmologies – was a central feature of their work includes such obvious names as Charles Darwin, Herbert Spencer, T. H. Huxley, Henri Bergson, and Samuel Alexander, and their predecessors Maupertuis, Diderot, Lamarck, and Goethe (see Glass, et al., *Forerunners of Darwin: 1745-1859*, 1959, pp. 265-291). Whitehead's significant contribution to speculative cosmology was his rigorous, detailed, and systematic working out of the implications of a fundamental ontology of 'experiential process' his 'occasions of experience.'

2. Whitehead describes, in somewhat technical language, this interpenetration of processes or 'prehensions': '[If A is a 'prehensive unity' of an actual occasion which prehends an aspect of B] I will say that the aspect of B from A is the mode in which B enters into the composition of A. This is the modal character of space, that the prehensive unity of A is the pre-hension into unity of the aspects of all other volumes from the standpoint of A... I can use Leib-

niz' language, and say that every volume mirrors in itself every other volume in space.'

And he goes on to say that temporal durations are 'exactly analogous': 'Each duration of time mirrors itself in all temporal durations... An instant in time, without duration, is an imaginative logical construction [i.e., an abstraction]' (SMW p. 65).

3. Whitehead: 'Thus, the sense-object is present in A [prehensive unity of an actual occasion, i.e., an 'event'] with the mode of location in B. Thus, if green be the sense-object in question, green is not simply at A where it is being perceived, nor is it simply at B where it is perceived as located; but it is present at A with the mode of location in B (SMW, p. 70).

'I am merely describing what we do perceive: We are aware of green as being one element in a prehensive unification of sense-objects (p. 71). ... Perception is simply the cognition of prehensive unification ... perception is cognition of prehension. The actual world is a manifold of prehensions; and a 'prehension' is a 'prehensive occasion'; and a prehensive occasion is the most concrete finite entity, conceived as what it is in itself and for itself, and not as from its aspect in the essence of another such occasion p. 71).

'Space and time exhibit the general scheme of interlocked relations of these prehensions. You cannot tear any one of them out of its context. Yet each one of them within its context has all the reality that attaches to the whole complex. Conversely, the totality has the same reality as each prehension; for each prehension unifies the modalities to be ascribed, from its standpoint, to every part of the whole. A prehension is a process of unifying. Accordingly, nature is a process of expansive development, necessarily transitional from prehension to prehension. What is achieved is thereby passed beyond, but it is also retained as having aspects of itself present to prehensions which lie beyond it' (p. 72).

And later he says: 'This concrete prehension, from within, of the lifehistory of an enduring fact is analyzable into two abstractions, of which one is the enduring entity which has emerged as a real matter of fact to be taken account of by other things, and the other is the individualized embodiment of the underlying energy of realization' (p. 105).

But this is confusing. It seems to contradict itself. On the one hand, Whitehead says the 'concrete prehension' of an enduring fact' is 'analyzable into two abstractions.' He goes on to identify one of these 'abstractions' as 'an enduring entity' He seems to be making a distinction between (a) 'concrete prehension:' (b) 'enduring fact:' and (c) 'enduring entity.' (a) and (b) qualify as 'actual entities:' (c) is an 'abstraction.' But then, on the other hand, he goes on to say that the 'enduring entity' (an abstraction) 'emerges as a real matter of fact to be taken account of by other things:' and this would qualify as an actual entity So which is it! Is an enduring entity an abstraction or a concrete actual entity! The distinction is not trivial because it involves Whitehead's important notion of the 'fallacy of misplaced concreteness' – which is mistakenly talking of abstractions as though they were concrete, actual entities.

It is clear from the rest of his work that the second term, 'individualized embodiment:' is an abstraction from the matrix of embedded internal and external relations. So this is not a problem.

4. On eternal objects as transcendental, Whitehead says: 'The foundation of the metaphysical position which I am maintaining [is] that the understanding of actuality requires a reference to ideality. The two realms are intrinsically inherent in the total metaphysical situation' (SMWp. 158).

And on universals: 'These transcendent entities have been termed 'universals.' I prefer to use the term 'eternal objects.' ... Eternal objects are, thus, in their nature, abstract. By 'abstract' I mean that what an eternal object is in itself – that is to say, its essence – is comprehensible without reference to some one particular occasion of experience... But to transcend an actual occasion does not mean being disconnected from it. On the contrary, I hold that each eternal object has its own proper connection with each such occasion, I term its mode of ingression into that occasion' (SMW p. 159).

However, later in *Process and Reality* (ironically, again on p. 158), Whitehead flatly contradicts his earlier equivalence of actual entities with particulars, and of eternal objects with universals: 'The philosophy of organism ... admits two ultimate classes of entities, mutually exclusive. One class consists of actual entities: which in the philosophical tradition are mis-described as 'particulars'; and the other class consists of forms of definiteness, here named 'eternal objects: which in comparison with actual entities are mis-described as 'universals'

The resolution of this apparent (if it is only apparent) contradiction, perhaps, is that Whitehead is taking issue in *Process and Reality* with the medieval or 'traditional' treatment of particulars and universals as though they were

(or could be) 'disconnected.' For Whitehead has for Aristotle's hylomorphism in classical philosophy), there could be no separation between immanent particulars and transcendent universals. In *Science and the Modern World*, Whitehead is quite explicit there is not (nor could there be) any immanent-transcendent or particular-universal disconnection. In Whitehead's philosophy, actual entities and eternal objects necessarily implicate each other all the way down—and all the way up.

So, even though Whitehead very clearly states in PR that actual entities are 'misdescribed' as particulars, and that eternal objects are 'misdescribed' as universals, it is the traditional disconnection between particulars and universals that Whitehead is rejecting in PR, and not so much the equivalence of particulars and actual entities or of universals and eternal objects. As long as we realize that particulars and universals (actual entities and eternal objects) are inescapably mutually implicated, the equivalence is unproblematic.

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