BOHM AND WHITEHEAD ON WHOLENESS, FREEDOM, CAUSALITY, AND TIME

by David Ray Griffin

Abstract. David Bohm's developing postmodern thought (combining precision and wholeness) is seen to contain two tendencies. One is a vision of "underlying wholeness," in which all causation is vertical, and the implicate-explicate relation is ubiquitous. This provides a possible solution to certain problems, but creates many others involving freedom, causation, and time. Second, many of Bohm's statements suggest that his deepest intuitions could be formulated without those problems in terms of the distinctions developed in Alfred North Whitehead's philosophy of "prehensive wholeness," in which the ubiquity of creativity would require a more restricted use of the implicate-explicate relation.

David Bohm's passion is to overcome fragmentation. As a reflective person, he is acutely aware of the problems, intellectual and social, that have resulted from the modern vision, which sees all things as externally related to all other things. This vision has led to the assumption that the truth about the world could best be learned by assigning its various parts to separate disciplines and the relative success of this procedure has reinforced the conviction that the intellectual divisions correspond to real divisions within reality, for example, between living and nonliving, between mind and matter, between humanity and nature, between deity and the world. This modern vision has reinforced the egotistical and tribal tendencies of us humans to think that the welfare of the individual person or at least group (social, cultural, religious, and/or economic) can be promoted by ignoring (or even defeating) the welfare of all the others.

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As a physicist, Bohm is aware that his own discipline was the major contributor to the rise to dominance of the mechanistic tradition in the modern world, that is, since the seventeenth century. Furthermore, he knows that physics is still regarded as the paradigmatic science, so that if the mechanistic vision is to be overcome, this could be achieved most effectively if developments in physics itself showed its own inadequacy. This is exactly what he believes has happened in the twentieth century, and he has devoted himself to trying to drive home this fact and to working out the new nonfragmenting vision he believes best makes sense of all the facts and provides a vision of wholeness adequate to our intellectual, religious, and ethical needs.

But these pragmatic considerations do not provide Bohm's only motivation. He is also deeply committed to discovering the truth about reality, to the degree that this is possible in our time. This leads him to reject the finality of the present quantum physics, whose equations merely describe the probability of what an observer with a certain instrument would observe, since this means that "modern physics can't even talk about the actual world!" (Bohm 1982a, 45). Not only does Bohm find this nonrealism unsatisfying, but he sees that it keeps the mechanistic vision, so deeply ingrained in the seventeenth through the nineteenth centuries, from being effectively challenged. Finally Bohm's two passions coincide: he believes that a realistic physics, which will once again intend to express the truth about the world (however partial this truth may be), will point to a vision of wholeness in which all things are seen as internally related to all other things.

Because Bohm radically rejects the two-fold tendency to see reality as composed of externally related things and to divorce physics from psychology, philosophy, and theology—the two-fold tendency which is of the essence of the modern vision—Bohm's vision is radically postmodern. (Bohm is post- rather than premodern since he wants to preserve the truths and positive values—and he does not minimize these—that have been attained by modern science.) In this paper I shall first summarize Bohm's proposal for a postmodern vision of reality and then discuss some problems involved in his proposal as developed thus far, problems relating to freedom, causality, and time. Finally, I shall suggest how various distinctions within Alfred North Whitehead's formulation of a vision of prehensive wholeness can avoid these problems while retaining the central intuitions in Bohm's vision.

Underlying Wholeness: Internal Relatedness via the Whole

In opposition to the mechanistic view which sees things as having merely external relations to each other, there seem to be two basic ways

of explaining how things are internally related to each other, so that knowing the truth about one thing would ultimately involve knowing the truth about all things, and promoting the good of one thing would involve promoting the good of all things. One way would be prehensive wholeness, which would see each individual as a microcosm, somehow grasping all other things into its own reality. Another way would be underlying wholeness, seeing all individuals as internally related to all others not directly, but by virtue of the fact that they all arise out of a common ground, which is thereby immanent in each of them, making each of them indirectly immanent in each other. Much of Bohm's language suggests that he uses the second way, that of underlying wholeness. For example, he says that "everything, including mind and matter, actively enfolds the whole (and through this everything else)" (Bohm 1892b, 39; compare Bohm 1982b, 20, 32, 34; Bohm 1982c, 333, 337).

Bohm rejects the notion of interaction, whether between mind and body or between two "particles." The term interaction suggests—and one must admit that Bohm is correct here—that the two things are first what they are, independently of each other, and then enter into relations with each other. The relations would then be external to their respective essences; the relation would not be constitutive or internal to either of them (Bohm 1980, 126-7, 134, 137). Of course, Bohm knows that there are organismic views, such as Whitehead's, in which interaction is not thought of in this way, but as involving mutual in-fluence (in-flowing) which is internal to each party. But he also seems to reject the language of interaction because in the vision of underlying wholeness one finite (explicate) thing does not directly affect another one at all. Rather, all influence is mediated via the implicate order, in the whole. Event A arises out of the whole ("projection"), and thereby affects the whole (however slightly). Then new events arise out of the whole, which appear to have been causally affected by event A. But they were not directly affected. Event A only directly affected the whole, and the later events each arose out of the whole, so they were only indirectly affected by event A. Hence Bohm speaks of the appearance of causation, and of things behaving "as if" there were a force between them (Bohm 1982a, 36; 1980, 184). There is really no horizontal causation from surface event to surface event; all causation is vertical, from the bottom up (projection) and then from the top down (re-injection).

This can provide the basis for a solution to the mind-body problem and for the wider problem of the interaction of mind and matter in general. We do not have to conceive of mind as having a direct influence on matter, or vice versa, but we can see that the correlations are

due to resonances in the implicate order. Likewise, the nonlocal correlations implied by quantum theory need not be explained in terms of literal action at a distance or of supraluminal signals, but can be understood as involving events which arose as explications of resonances in the implicate order where the separative space of the explicate order does not exist, except in implicate form: all places are enfolded in the whole (Bohm 1980, 129, 186). The phenomena of parapsychology which seem to suggest action at a distance (e.g., telekinesis, telepathy) would presumably also be explained by Bohm in this fashion. Even precognitive phenomena, which seem to imply the influence of the future on the present, might be so explained, since Bohm sometimes suggests that the implicate order is timeless, in the sense of enfolding all times (Bohm 1980, 155, 167; 1982a, 36). From the viewpoint of the explicate order, which orders events sequentially, so-called precognition would really involve only the resonance of an event that is explicate now with an event that is later to become explicated.

The solution to the mind-body problem mentioned in the previous paragraph would imply that what we call mind or experience or consciousness is as fully an example of the explicate order as what we call matter. Development of this line of thought would make Bohm's position somewhat similar to Spinoza's, who thought of there being one infinite substance which has an infinity of attributes, with thought and extension being the only two known to us. This avoided the Cartesian problem of how two totally different kinds of substances, thinking and extended ones, interacted, by denying that there are two kinds of substances, and in fact that there is a multiplicity of distinct substances at all. Mind and matter are simply two attributes of the whole, and attributes are not the kinds of things which have to figure out how to interact.

However, there is another tendency in Bohm's thought, the tendency to say that mind or consciousness is more illustrative of the implicate order than is matter (Bohm 1980, 197; 1982b, 31, 32). This is a tendency to which I shall return. However, for now I need to explore the monistic question suggested by the Spinozistic parallel. Regardless of how Spinoza should be interpreted, is Bohm monistic in the radical sense of attributing all agency to the whole, so that the apparently multiple individuals have no agency of their own vis-à-vis the whole, so that a complete determinism (albeit a nonmechanistic one) would be the ultimate truth? Some of his language does suggest this, as when he portrays the universe, in Hegelian language, as observing and describing itself through human beings (Bohm 1982c, 13), when he says that each event in the explicate order is "simply a projection" of the whole (Bohm 1982a, 43), and when he speaks of an "overall necessity"

(Bohm 1980, 181; compare Bohm 1980, 195, 204-5, 209, 213), and suggests that if we could "actually determine all the sub-quantum variables" we would be able "to predict the future in full detail" (Bohm 1980, 106). However, he has clearly rejected this interpretation of his meaning. He sees the indeterminism of quantum physics as pointing to indeterminism as a property of matter (Bohm 1980, 85, 105). And he affirms that the universe is "a self-acting whole" which is "in some sense distinct from (i.e., autonomous and independent of) the activity of the entities of the explicate order" (Bohm 1982c, 336, 333). This implies that the *entities of the explicate order have some autonomy of their own*, making them distinct from the activity of the whole; and he affirms this explicitly, saying that "each of the sub-wholes has its its appropriate kind and degree of freedom" and that the harmony of each event with the whole and hence with all others cannot be perfect, due to the law of freedom (Bohm 1982c, 337). However, Bohm does want to insist that the holomovement, the activity of the whole, is *primary* and that the individual events have a "vanishingly small degree of substance or independent actuality" in relation to the totality (Bohm 1982c, 334, 339; 1982b, 93).

One further point to mention in this brief overview of Bohm's view of wholeness is that he means it to provide a way to explain how novel forms can appear in the explicate world. If events simply arose out of the past explicate world, the rise of genuinely new forms would be unthinkable. Also, even if one allowed for novel forms to be inserted now and then by an agency beyond the multitude of finite beings, this would seem to involve an ad hoc, exceptional type of influence. But Bohm's view is that events are constantly being created by the whole and then dissolving back into it. This allows a *natural* way for a creative content to enter the world at any point (Bohm 1982a, 47). Apparently enduring things, such as electrons and minds, are really world tubes, composed of a series of events, with each event replicating its predecessor more or less exactly (more exactly in the electron, less so in a human mind). The other presupposition necessary for explaining the emergence of novelty is that the whole has a *purpose* to bring about new subwholes. This deep intent of nature can explain why the evolutionary process has brought forth a richness of forms far beyond anything survival as the only goal would dictate (Bohm 1982a, 39, 40).

Problems in the Vision of Underlying Wholeness

In this section I shall discuss several problems that would arise if Bohm's position is to be understood as that of underlying wholeness alone, without the direct horizontal causation involved in prehensive wholeness. These implications would be problems because they would

be inconsistent with some of Bohm's deepest concerns and/or with some of our deepest convictions, or at least they could be reconciled with them only by ad hoc measures.

Creaturely freedom minimized. One problem is that human freedom, or the power of self-determination, is minimized. In the first place, Bohm has not given primary attention to the issue of freedom. When he characterizes the mechanistic vision, the focus is always on the externality of relations rather than, as for many people, the determinism implied by mechanism. He even says that the fact that the laws of quantum physics are statistical instead of deterministic has little or no relevance to the issue of mechanism (Bohm 1982b, 10-11; compare Bohm 1980, 173, 178). And, as indicated above, when describing his own position he has not always been careful to avoid statements that could be interpreted to mean that all events, human and nonhuman, are totally determined. In the second place, after clarifying that he sees all events as having some degree of agency for self-determination vis-à-vis the whole, he stresses that the agency of the whole is primary, while that of the subwholes is vanishingly small. In the third place, the focus on the dialectic between the implicate and the explicate, combined with (sometimes) seeing mind and matter as equally explicate, has a leveling effect, suggesting that the human mind has the same vanishingly small degree of power for self-determination as an electron: there is no suggestion of a *hierarchy* in nature, with increasing degrees of self-determining power.

This minimization of our agency undermines the conviction running throughout Bohm's writing, that the mechanistic, fragmenting vision has been a tragic distortion of the truth, and one which we need to and can overcome. If we have only a "vanishingly small" degree of power vis-à-vis the whole, how can be believe that we have deviated seriously from its "deep intent"? Here we have a version of the problem of evil: if the creatures have only very little power in relation to the creator, so that they are virtually mere creatures (not self-creating ones to any significant extent), how can they significantly sin, that is, miss the mark? Also, if our power for self-determination is so minimal, how can we believe that our efforts to develop better insight, and to share this with others, can have any effect (even aside from the issue as to whether we can affect others directly, or only via the whole)? To stress that our power is vanishingly small is implicitly to say: whether or not a new vision comes to dominate is primarily up to the whole, hardly at all up to us. This belies the passion involved in Bohm's own efforts to help change the dominant vision. (It may be true that true insight comes not from effort in the usual sense, but through being receptive to inspira-

tion. But, even to the degree that this is true, it takes considerable effort to get ourselves into a truly receptive attitude!)

Denial of direct causation. A second set of problems arises from Bohm's apparent denial that events exert any direct causation upon other such events. First, this denial would run *counter to one of our deepest convictions*, which is that we do directly interact with other things from which we are partly distinct—that other things do affect us directly, and that we directly affect other things. My body affects me, and I my body; through my body I am affected by the surrounding world, and I affect it. Bohm's formulation, according to which each enduring thing is a series of events, each of which arises out of the whole and then dissolves back into it, thereby modifying it slightly, seems to deny this conviction. Each event affects other events only by affecting the whole, out of which the later events arise. It is similar therefore to Nicolas Malebranche's view: I cannot kick you directly, but only (as it were) by kicking God who in turn kicks you!

Second, the denial of direct effects would also make the *stability* of the world mysterious, reconcilable with the theory only by an ad hoc solution. Why do certain forms of order, for example, electrons and molecules, keep repeating themselves for eons? Bohm admits that his view entails that "in principle, every new moment could be entirely unrelated to the previous one—it could be totally creative" (Bohm 1982a, 36; compare Bohm 1980, 205). But experience shows us, as he points out, that "there is usually a great deal of recurrence and stability leading to the possibility of relatively independent sub-totalities" (Bohm 1980, 205). Now, this idea of "relatively independent sub-totalities" is stressed repeatedly by Bohm; it connects his views with the world as experienced by us. And he does seek to explain how this occurs in a way that is consistent with his basic principles, suggesting that a series of repetitions of a form will create a "disposition" of the implicate order to produce that form (Bohm 1982a, 36). A form is projected into the explicate order, then introjected back into the implicate order, then back into the explicate, and so on. Each introjection influences the whole, creating a tendency for it to explicate itself in terms of that form. This is how Bohm explains "the appearance of the 'causation' of the present by the past" and the "interesting point" that "each moment resembles its predecessors" (Bohm 1982a, 36, 42).

However, one thing this theory does not explain is why the same (or similar) forms are almost always repeated in roughly the same place, vis-à-vis the other forms that are being repeated. The forms embodied in the aggregate of events I call the typewriter before me tend to be repeated second after second, minute after minute, hour after hour, in the same place, that is, with the same spatial relations to the other forms

that are being constantly repeated, namely, those which I call the house, the desk, the lamp, and my body. Bohm's account seems at most to account for the disposition of the whole to repeat the same forms; it *does not account for the disposition to repeat them in the same or at least a contiguous place*. Bohm's theory has the virtue of explaining how the phenomena normally called teleportation or materialization and dematerialization can occur. But on the basis of his theory we should expect these phenomena to be much more common than experience teaches us they are. If events do not directly affect their successors in a world tube, but only by first influencing the whole, in which all times, places and forms are merged, we have no reason to expect the introjected form to be reprojected next to approximately the same forms it was by in the previous moment.

Third, there is a closely related problem: If one thing does not really affect another one directly, but only indirectly via the whole, why is causation between contiguous events so overwhelmingly important in our world? Bohm's theory explains how nonlocal correlations in physics (and parapsychology) can occur. But Bohm himself says that the evidence to date in quantum physics suggests that nonlocal effects arise only under very special conditions. Furthermore, even if physics does come to show that *all* "particles" manifest nonlocal correlations with others, and if parapsychology convinces us that there are influences (or at least correlations) between noncontiguous events far beyond the relatively few instances of consciously detected extrasensory perception and obvious psychokinesis, this will not change the fact that causal relations between contiguous events are overwhelmingly important. Bohm's theory, by saying that every event is connected with every other event in the implicate order, explains how nonlocal correlations in the explicate order are possible. But *if it denies that events have direct influences upon other events, it does not explain why local correlations are so important*.

Fourth, there would be an element of arbitrariness in the affirmation that events exert direct causal influence upon the whole but not directly upon other subwholes (Bohm 1982a, 36). Insofar as Bohm distinguishes between the whole and the multitude of subwholes, allowing each some autonomy vis-à-vis the other, it would seem more consistent to allow that each event would have a direct influence upon subsequent subwholes, as well as an indirect influence upon them via its influence upon the whole. This vision would combine underlying and prehensive wholeness.

Time and the implicate order. Another set of problems could be created by Bohm's suggestion that all times (as well as places) interpenetrate in the implicate order (Bohm 1982a, 36; 1980, 155, 167), so that

the implicate order would be beyond time in the sense that the *distinction between past, present, and future would not be real* in that order (Bohm 1982a, 37, 43).

In the first place, there is the problem of the compatibility of the belief in genuine freedom and creativity, which Bohm wants to affirm, with the belief that in the really real order the totality of what we regard as future is already settled. If those events which are still future for us are, in some more real realm, as fully settled as those which we regard as past, so that *the present implies the details of the future as fully as it does the details of the past, then each present event really has no power of self-determination*. Accordingly, insofar as people are logical, belief that there is an implicate order in which all times interpenetrate will undermine Bohm's call to exercise our creativity to change the way we and others think.

In the second place, Bohm thinks of the implicate order as having awareness and purpose (Bohm 1982a, 37, 39). To think of the implicate order as "the totality beyond time" raises all the problems which have been endlessly debated as to *whether it is even meaningful to speak of a nontemporal awareness and a nontemporal purposiveness* (Bohm 1982a, 43). I say that these have been endlessly debated; but there does seem to be a growing consensus, shared by atheists (e.g., Jean-Paul Sartre) and theists (e.g., Charles Hartshorne) alike, that these notions are not meaningful because they are self-contradictory. Bohm is aware of the problems. He says, "Whatever knowledge this implicate order would have would be beyond time. Therefore, I don't know if you would even think of it as knowledge" (Bohm 1982a, 37). And after saying that the universe seems to be experimenting with forms, he says, "it shows itself to us *as if* it were experimenting. That is, when looked at from the limited aspect of time, the structure *looks like* an experiment" (italics added) (Bohm 1982a, 37). If those few events which seem to imply that the future is already as settled as the past, that is, so-called precognitive events, could be explained without denying the ultimate validity of the distinction between past, present, and future (and I argue elsewhere that they can), would it not be better to limit the nontemporality of the whole to an abstract element within it and to retain the experienced asymmetry between past and future as an ingredient in our theories about the ultimate nature of things, since we can thereby more clearly retain freedom and meaningfulness?

Whitehead's Vision of Prehensive Wholeness in Relation to Bohm's Concerns

Some of the problems in Bohm's formulation of his vision thus far are matters of self-consistency; others are tensions between his formula-

tion and our deepest convictions. All of these are related, I suggest, to a more general problem, a tendency to use the implicate-explicate distinction too indiscriminately. Many of the analogies Bohm has lifted up between apparently dissimilar features of the world and human experience are indeed illuminating. But in some cases the general formula, the explicate unfolds from the implicate and is then enfolded back into it, leads to tensions with our deepest intuitions or with other applications of this formula. This is because some fundamentally different types of relations are subsumed under the general implicate-explicate formula.

In this section I suggest that some distinctions developed by Alfred North Whitehead can preserve the affirmations about which Bohm is most concerned while avoiding the problems in his formulation of these affirmations as developed thus far.

Whitehead in many respects travelled a path similar to Bohm's. He also was a mathematical physicist (though primarily a mathematician) passionately interested in the relation between the world as described by physics, on the one hand, and the phenomenon of life, on the other, and the relation of both of these to the world as known through moral, aesthetic, and religious experience. He was also deeply disturbed by the deleterious effects the vision of reality formulated in relation to the natural sciences has had upon the modern world (see his *Science and the Modern World* [1925]). He likewise began with a vision of wholeness reminiscent of Spinoza's but then went beyond it. It is primarily the distinctions he developed in moving beyond Spinoza's monistic and deterministic vision which are helpful in resolving the tensions within Bohm's developing position.

God and creativity. Much philosophical and religious thought, both East and West, has understood undifferentiated being as the ultimate reality. It has variously been called Being, Being-itself, Prime Matter, *Ungrund*, the Godhead, Brahman, and Emptiness. Whitehead calls it Creativity. It is formless; it is being without attributes (Nirguna Brahman). Whitehead says "it is without a character of its own" (Whitehead 1978, 31).

There have been two major ways in which this metaphysical ultimate has been thought to be related to a determinate, perhaps personal, deity (Saguna Brahman). On the one hand, a determinate deity has been regarded as the first emanation from the indeterminate ultimate reality. How that which is totally devoid of all form, all determinateness, could give rise to something with form has always been a problem. But the affirmation has been widely made.

On the other hand, some traditions have simply identified God and Being-itself. This creates inevitable tensions. Sometimes, as in Paul

Tillich's work, the affirmations made about the personal God of religious devotion have to be interpreted so as not to contradict the philosophical vision of an ultimate reality said to transcend all determinate characteristics and hence to be beyond attributions of, for example, love, knowledge, purpose, and agency. The pious are allowed to continue applying such terms to Being qua God, but the philosophical theologian knows that the attributions cannot be applied literally, or even analogically, but only symbolically, metaphorically. This view also means that God can exert no influence: there is no concrete whole in the sense of an all-inclusive embodiment of Being. The only embodiments are the multiple finite instances of Being. Being-itself is not a being which can influence or be influenced by the various beings; it is simply the being of the many beings.

At other times, as in Thomas Aquinas's writings, the indeterminateness of Being-itself is compromised by being equated with the determinate God. This equation leads to total determinism, since all being and hence power and activity belong to (are identical with) God.

One of Whitehead's major innovations was to diverge from these two dominant ways of relating God and Being. Whitehead distinguishes between God and Creativity, and yet makes them equally primordial. God is not simply Creativity; God has determinate characteristics: God knows the world, envisages primordial potentials with appetition and purpose, influences the world, and is in turn influenced by the world. God loves the world actively, seeking to influence it towards its good, and receptively, responding sympathetically to its events. But God is not a derivative emanation from Creativity; God is the primordial embodiment of Creativity. (Creativity is that which is instantiated by all actualities; it is not an actuality which could exist by itself, unembodied.) Whitehead refers to God as the "eternal primordial character" of Creativity (Whitehead 1978, 225; compare p. 344).

I suggest that Bohm has thus far wavered between these three visions. Sometimes he speaks in a Vedantist-Neoplatonic way, as if the ultimate reality, the ultimate implicate order, were totally formless. For example, he says in an interview, "We must have some form—we can't live entirely in the implicate order" (Bohm 1982a, 36). In this mood, he speaks of all "measure" as created by human insight, denying that "it exists prior to man and independently of him" (Bohm 1980, 23). Reality as such would be formless, Brahman without attributes. All form and measure would be *maya*, illusion. In line with this vision, Bohm can legitimately say we have freedom. For, each of the explicate parts, each of the events of the world, would be an embodiment of the whole, which is a holomovement, dynamic activity. But if he were to carry out this vision consistently, he would not be able to talk of the influence of the Whole on the parts (except as the whole meant the

totality of the parts, and this is the mechanistic vision he wants to avoid), nor the influence of the parts back upon the whole (i.e., of the enfoldment back into the implicate order as somehow altering it). It is not for nothing that consistent visions of this sort stressed that the ultimate reality was impassible.

More characteristically, Bohm seems to equate God and Being somewhat in the Thomistic fashion (at least as I am interpreting Thomas), and to see this somewhat determinate reality as the ultimate implicate order. Accordingly, Bohm speaks of the ultimate implicate order as having intelligence and compassion. But this vision, if carried out consistently, would lead to determinism. For, if all energy, movement, or activity as such is equated with a concrete being (and only a concrete, determinate being can have attributes such as intelligence and compassion), then the creatures have none of their own. In this vision, *all causation is vertical*: there is a hierarchy of levels of order. Each level (except the highest and the lowest) is implicate in relation to the level above it, and explicate in relation to the level deeper than it. (In line with speaking of underlying wholeness, I am referring to the more implicate orders as "deeper," even though Bohm often speaks in Neoplatonic fashion of descent from the highest implicate order to the more explicate orders.) The implicate-explicate language here suggests determinism: each level is a mere explication or unfolding of what was already there, implicit or enfolded, in a deeper level. And indeed, Bohm sometimes says that there is an infinite hierarchy of implicate orders, suggesting that this somehow avoids the conclusion of total determinism. But this is problematic. First, it is hard to see what it might mean. Second, it is hardly consistent with speaking of the "ultimate" implicate order as characterized by love and intelligence. Third, if the level of conscious human experience is totally a product of some deeper level, it does not mitigate the implied determinism to say that the series of increasingly deeper levels of causal orders never reaches bedrock. But, the fact that Bohm thinks there is a problem requiring a solution shows that he often does not think of each level of reality as having its own activity, creativity, or freedom, by which events can partially determine themselves vis-à-vis other levels, and the whole.

Bohm's statement that these events do have some such power, but that it is "vanishingly small," can be regarded as a compromise between the first two visions. But his intuitions that these explicate events somehow affect the whole, even if only slightly, can fit with neither vision. If the ultimate implicate order is formless, we cannot affect its form; if it has all the activity, so that we are merely emanations from or explications of it, then we have no agency by which we can effect a change in it.

But Bohm's intuitions here can be conceptualized in terms of Whitehead's new vision, in which God and Being (i.e., Creativity) are distinguished. Creativity is embodied by all events. Creativity is the three-fold capacity of events to be influenced by previous events, to create themselves partially, and to influence subsequent events. Creativity is embodied by every local event (actual occasion) and by the all-inclusive series of events (God). Accordingly, God has autonomous power to influence the world, and the capacity to be influenced by it (this latter capacity is called God's consequent nature). Likewise, each local event constituting the world arises out of the Whole at that moment, meaning God and the totality of previous actual occasions. But each event then influences God and all subsequent local events. Accordingly, the Whole out of which the next moment of the world will arise will be slightly different from what the Whole was a moment before.

In this vision, God is not seen as owning Creativity (or Being-itself) any more than does the world. God has always existed, instantiating Creativity. But so has the world. Not this world, with its contingent forms of order; but some world or other, with a multiplicity of actual occasions embodying Creativity. Creation of our particular world was not initiated by a creation *ex nihilo*, in the sense of a total absence of finite forms of actuality, but was a creation out of chaos, out of a less ordered realm of finitude.

Accordingly, the relation between God and finite events cannot be described in the language of implicate-explicate, for at least two reasons: first, God and local events each have self-determining power in relation to each other, so neither is merely the unfolding of what was contained implicitly in the other. Second, local events are directly influenced by previous local events, not just by God: the Whole out of which they arise is God-and-the-world.

Although there is hierarchy in this Whiteheadian vision, there are distinct realities which are not related hierarchically. Rather than a Neoplatonic-type descent from Creativity, to Forms, to God, to Creatures, all of these realities are equally metaphysical, equally primordial (with the qualification that no particular creatures are necessary, only Creaturehood as such, i.e., there must be *some* creatures). God is as primordial as Creativity, with each implying the other. God, as a determinate being, can act: God's primordial activity is the appetitive envisagement of the Eternal Forms (eternal objects), the Primordial Potentials, which imply God and Creativity as much as being implied by them. And God, Creativity, and the Forms all imply, and are implied by, a realm of Creatures who will inform their Creativity with a selection from the Eternal Forms.

This set of mutually implied (rather than hierarchically arranged) realities protects our intuitions about freedom, causation, and time. The distinction between God and Creativity, which allows the creatures to be equal stockholders in Creativity, protects the freedom of the creatures. It also protects the concreteness and transcendence of God, and hence causal influence between God and world. The idea that God is not derivative from Creativity protects the ultimacy of determinateness, including the temporal distinction between past, present, and future. The idea that the Creativity embodied in the creatures is not derivative from God also protects the ultimacy of temporal distinctions. The idea that God also embodies Creativity gives further support to the ultimacy of temporal distinctions, since, besides God's primordial, nontemporal, aspect, there is God's concrete actuality, which is temporal, that is, which distinguishes between events which have occurred and possible events which have not. Also, this fact that God as concrete is temporal allows us to speak of an all-inclusive awareness and purpose without contradiction, and without undermining the reality of time and freedom. Our future could hardly be indeterminate, to be rendered determinate only by our exercise of creativity, if from a higher point of view the events which seemed future to us at a certain "now" were already (or eternally) determinate.

Events in themselves and for others. I have distinguished between three phases of Creativity: an event's reception of influences from its environment, its self-determining activity, and its influence upon subsequent events. In this section I shall collapse the first two moments into one, referring to this moment as the event as it is in itself; the third moment will be identical with the event as it is for others.

The event in itself is a subject. It does not enfold the influences from the environment the way a cabinet receives canned goods, but the way a moment of experience receives influences from its body and the greater world. It does it with feeling. In fact, Whitehead refers to each local event, each actual occasion, as an occasion of experience. Every true individual (as distinct from aggregates of individuals, such as sticks and stones), has (or is) a unity of experience, in which a vast myriad of influences are synthesized. This reception of influences, and self-determining synthesis of them into a unified experience, is what an event is in itself. This internal, self-determining process is called concrescence, which means growing together. This notion corresponds with Bohm's attribution of an inner formative activity to events in their phase of enfolding (Bohm 1980, 12, 13, 79).

But as soon as this unity is reached, the event becomes an object for others. The subject becomes a superject. The event as a becoming

subject perishes; the event as a causal power upon others comes into being. The data which it had enfolded are now unfolded or superjected into the universe. It reveals publicly what it had been doing privately. What was a subject in itself becomes something for others, and in this sense an object. Whether it also becomes an object of sense perception, and/or an object of consciousness, depends upon whether there are subjects around capable of making it into an object in this more sophisticated sense. But it, willy-nilly, becomes an object in the sense of a causal influence upon subsequent subjects, which unify it (along with the rest of the environment) into their internal reality and which then in turn perish as subjects and become objects or superjects for subsequent subjects, and so on.

This provides a way of distinguishing between mind and matter without an ontological dualism making their mutual influence unintelligible. Rather than being two different types of actualities, "mind" refers to what an actual entity is in itself, whereas "matter" refers to what it is for others. Our self-consciousness at a moment is our direct knowledge of what an event is in itself: we know what a thing in itself is by being one—and by being one which is sophisticated enough to be aware of itself. (Lower-grade subjects would have awareness, but not self-awareness.) We do not have the same kind of direct knowledge of the subjectivity of other individuals. But since we know that we have subjectivity, even though it does not appear to others, we can assume, by analogy, that other individuals had their own subjectivity prior to their becoming objects for us. Bohm suggests this nondualist position, saying that what we call matter has something analogous to mentality, creativity, and imagination (Bohm 1982a, 39, 47).

I am using the word "individual" deliberately. There are also aggregates of individuals, such as sticks, stones, and tables. These answer to the ordinary notion of matter even more than does the objective existence of individuals such as electrons, atoms, molecules, and cells. These aggregates show no signs of the spontaneity we associate with subjectivity, since the uncoordinated spontaneities of the millions or billions of members of the aggregate (e.g., the molecules in the rock) cancel each other out with the result that no unified movement is attained.

There are some groupings of individuals which are not mere aggregates, however. These are "compound individuals," in which a higher-level series of subject-then-object events arises and has a dominating influence over the society as a whole. Animals, including ourselves, are the obvious examples. But atoms, molecules, and living cells can also be thus regarded. The world of finite things can then be classified into these four basic types of things: actual occasions; enduring objects,

which are serially-ordered societies of occasions (Bohm's "world tubes"); nonindividualized societies of enduring objects (inorganic things, plants); compound individuals. A high-level compound individual habors, as its dominant member, a series of higher-level occasions of experience, a soul.

It seems to me that this position is already implicit in Bohm's thought, insofar as he speaks of each event as enfolding the whole and then unfolding itself back into the whole, and of a so-called particle as in reality being a world tube or a trajectory of such events of enfolding and unfolding. His complaint against orthodox physics would be that it has thus far assumed that the events in their unfoldment, or explicate state, constituted the full reality of the events, thus ignoring their prior, implicate state. His suggestion that there are hidden variables to account for the behavior of observed events would mean that the explanation may lie in what the event is in itself, in its subjective moment, which has at least an iota of self-determining power. Bohm comes close to this view when he suggests that mind or consciousness is more illustrative of the implicate order than is matter. I am urging him to say that self-conscious experience is our one opening into what an event in its state of enfolding is, and then to generalize some degree of experience to all events.

The Whiteheadian position would have the following advantages to Bohm. First, it would show how mind and body can be directly related, without having to route this apparently direct relation through some underground reality. Bohm is right to say that mind and matter are related through some more fundamental reality. But this more fundamental reality need not be thought to exist beyond the concrete events of the world. The concrete events are themselves this more fundamental reality, each being first a subject which enfolds previous subjects-become-objects into itself and then in turn unfolds itself as matter for subsequent events. What we call our own mind or soul is simply a very high-level series of subject-object events dominating a body made of societies composed of lower-grade events with this dual nature. Since there is no ontological dualism, mutual influence is no problem.

Second, this position would show the fundamental reality, and irreversibility, of time. Time results from the causal relations between events. The irreversibility of time is due to the relationship of enfolding and being enfolded. If event B is later than A because B included A but A does not include B, it would be nonsense to suppose that time could then go backwards, so that event A would be later than B. For this would mean that B would both include and not include A, which is a self-contradiction.

Time is not an actuality which could exist apart from events. But since Creativity is the ultimate reality, so that there always has been and always will be on-going relationships of including and then being included, time in the sense of a distinction between past (determinate, included), present (including, becoming determinate), and future (indeterminate, not included [at least in the same sense as the past is included]) is a necessary feature of reality.

Third, this doctrine allows real causation (versus positivism) but without a mechanistic view of causation as total determination and mere external relation. The direct causation of one event upon another can be affirmed, and yet Bohm's view that there is no causation between two explicate objects is supported. The causation of one event (as object or superject) is not directly upon a subsequent event's superjectivity; rather, it passes through the affected event's subjectivity, and hence through an implicate ordering process, which involves some element of self-determination, and which is hidden to the outside observer. It is only when the affected explicate event is our own behavior that we are privy to what goes on in between the two explicate events.

Of course, we are only partly privy to this process, since much of it transpires below the threshold of consciousness. This is another way in which Bohm uses the implicate-explicate distinction: conscious experience can be considered an explication of unconscious experience (Bohm 1982b, 67). And, one moment of conscious experience, as explicate experience, does not directly affect a subsequent conscious experience, but only indirectly, by passing through the unconscious depths of the next moment of experience. It should be noted, however, that this is not an example of causation by one event upon another, but of different phases within a teleological, self-determining process. But even here the explicate (i.e., conscious) aspect is not merely an explication of what is already determined in the implicate depths: the conscious aspect of experience plays a role in the self-determination of a moment of experience. Consciousness is not merely an epiphenomenal by-product of unconscious forces. So, even though the implicate-explicate formula works here better than for many distinctions, it is not fully appropriate.

However, terminology aside, Bohm's point is important, and supported by Whitehead. Consciousness, according to Whitehead, tends to light up only the later phase of an occasion of experience, not the early phase, where the enfolding of the environment occurs. Hence consciousness tends to lose sight of the connectedness of experience with its world—the fact that it arises out of and even includes the whole past world (and God) in itself. Accordingly, the soul, insofar as it

identifies itself with its conscious experience, comes to see itself as an independent substance, only externally connected to the surrounding world. Solipsism can even be seriously entertained. Bohm is right: our conscious experience can seem to be even more disconnected from its environment than the matter we perceive (and construct—see below) through our sensory experience (Bohm 1982b, 94-95). Insofar as Bohm is using the implicate-explicate distinction to stress that this apparently disconnected consciousness is part of a far vaster experiential process in which the whole world is enfolded, the distinction is justified.

Fourth, Whitehead's way of speaking of an enduring object as a serially-ordered society of events provides a basis for conceptualizing another of Bohm's concerns, which is to affirm that nature has a "deep intent" to realize new forms and that the world is somehow able to respond to this. Bohm says, for example, "You might suppose, say, that somehow nature realizes that it's being presented with various things that now have to be brought together. Nature realizes this greater whole at a deeper level, which is analogous to imagination" (Bohm 1982a, 47).

Whitehead's explanation is as follows: The primordial nature of God, which is the Divine Eros of the universe, is God as envisaging the primordial potencies with appetition that they be realized in the world (Whitehead 1978, 32-34). Worldly events, for which a given potentiality is relevant, come to feel this potentiality for its future successors conformally, that is, with appetition. Many successive members of a given enduring society (world tube) could continue to feel this possibility for the society's existence. But as long as it was only felt with appetition, or mentally, nothing would be changed in the outer appearance of the enduring object. The successive occasions of experience would in themselves be different, in that the new possibility would be fermenting in them; but their outer demeanor would remain unchanged. The new form would only be implicit in the society. But at some point, as Bohm says, "it unfolds into the external environment" (Bohm 1982a, 47). In Whitehead's terms, this is when some member of the society feels the possibility not only mentally, which is a restricted way of feeling it, but physically, or unrestrictedly (Whitehead 1978, 291). This occurs when there is a hybrid physical feeling: an occasion feels physically what was felt by a predecessor only mentally. To feel it physically is to accept it as characterizing one's own shape. At this moment, the new form becomes observable and has effects upon the environment. Accordingly, Whitehead supports Bohm's intuition that novel forms do not suddenly arise in the observable world out of nothing, or even directly from other observable events, but from an implicate, hidden dimension of the world.

Incidentally, this doctrine is germane to the problem of evil. God's causal efficacy does not directly produce the form of the observable world, but is twice removed from it. First, God must wait for events in the world to feel the divine appetitions for them conformally, that is, to develop an appetition for these new forms. Second, even after this appetite is whetted, the novel possibilities will not become manifest in the world until some event makes the leap from entertaining the possibility to actually living in terms of it.

Fifth, the distinction between hybrid physical prehensions and pure physical prehensions provides a causal basis for accounting for nonlocal correlations (i.e., between noncontiguous occasions) while accounting for the special significance of causation between contiguous events. In a pure physical prehension, the form prehended from a previous occasion is one which is energized by the creativity in the physical pole of that occasion. Forms which have been physically realized are unrestrictedly realized, and hence are superjected with the full energy of the occasion behind them, and hence with considerable compulsiveness. Forms which are realized only conceptually (mentally, appetitively) are not embodied in the event's physical energy, but only in its mental energy, which may be negligible. The prehension of such a form from an antecedent occasion will mean, at least usually, the reception of data without compulsive, but only persuasive, power.

This distinction should correspond to Bohm's suggestion of two forms of energies: the denser explicate energies, and the subtler implicate energies which "would not ordinarily even be counted as energies" (Bohm 1982a, 39, 44). Here again, Bohm's "implicate" would correspond with "Whitehead's "conceptual" or "appetitive."

Whitehead suggests that pure physical prehension is limited, at least for the most part, to contiguous occasions. If so, that is, if compulsive influence occurs only between contiguous occasions, this explains why contiguous causation is so important in our world, so much so that the modern mind has thought it to be the only kind of causation.

But since Whitehead does not consider it the only kind, he has a basis for explaining action at a distance. That is, he suggests that hybrid physical prehensions can occur equally between contiguous and noncontiguous occasions. This provides for another kind of influence, different from the physical energy of current physics.

Hence, Whitehead explains both local and nonlocal correlations in terms of prehension, and hence of direct causation of one event upon another. With a Whiteheadian basis, one need not resort to noncausal synchronicity, rooted in some timeless dimension in which all things are together, in order to explain parapsychological events, or nonlocal correlations in physics. By allowing for direct prehensions of remote events, the speed of light does not put an upper limit on the time in

which one remote event can influence another. Accordingly, one need not assume that some connection, other than a direct one between the two events, is needed in order to explain the nonlocal correlations in physics and parapsychology. One thereby avoids the problem as to why, if events do not directly influence other events, the apparent causal connections between contiguous events are different in kind from those between noncontiguous events.

Incidentally, I should add that Whitehead was not dogmatic about limiting pure physical prehensions to contiguous events. He said: "*Provided* that physical science maintains its denial of 'action at a distance,' the safer *guess* is that direct objectification is *practically* negligible except for contiguous occasions; but that this practical negligibility is a characteristic of the present cosmic epoch, *without* any metaphysical generality" (Whitehead 1978, 308; italics added to highlight the four qualifications given). Accordingly if physics or paraphysics seems to require it, for example, for instances of psychokinesis, there would be no metaphysical reason to deny that the more compulsive type of causality could be exerted at a distance.

In any case, assuming for the most part that pure physical prehensions occur only between contiguous events, we can see that each kind of causation has its own advantage. The kind exerted only between contiguous events has much more immediate strength. But the kind which can be exerted between noncontiguous events can develop strength through repetition. Hence, Whitehead's position provides a basis for the kind of point made by Carl Jung and Rupert Sheldrake, that the repetition of a form countless times in the past creates an "archetype" or "field" which exerts a formative influence upon present events. If a particular form is repeated in events A-D, event E will receive the same form directly from A, from B (which includes A), from C (which includes both A and B) and D (which includes, A, B, and C) (Whitehead 1978, 56, 226, 284). Hence, even though noncontiguous causation of event A upon event Z may be trivial compared with its contiguous causation upon event B, the noncontiguous causation received by Z may be as important as the contiguous causation, due to the cumulative effects of countless repetitions of a similar pattern.

This point, although often overlooked by Whiteheadian interpreters, is a key to his central description of Creativity, which is that "the many become one, and are increased by one" (Whitehead 1978, 21). The "many" out of which any event is created is finally the whole past, not just the immediate past: "the whole world conspires to produce a new creation" (Whitehead 1960, 109). This provides a very strong notion of wholeness, of each event as a microcosm, incorporating in some sense the whole world, and of the world is an organism, in which

the whole enters into every part, not a machine, in which causation by contact is king. And of course the whole which is prehended by each part is not only the whole past world, but also God, who has incorporated the whole past world into an all-inclusive experience. And yet all this wholeness is affirmed on the basis of the category of prehension alone, which means that the distinction between past, present, and future is never compromised. Wholeness is compatible with there being no causal influence except from past to present. The future and the contemporary worlds are left as indeterminate, and hence as exerting no causation upon the present event. This allows our intuition of freedom, in the strong sense of the capacity for self-determination in the moment, to remain unthreatened by our intuition of wholeness.

The worlds of causal efficacy and of sensory experience. One of the chief concerns of Whitehead is to distinguish the actual world, in which real causal efficacy is exerted among events, from the world as it appears to our sensory perception, especially vision. This latter world is not the world as it actually is, but is an appearance produced by our sensory and conscious experience out of the actual world's causal efficacy upon us. This appearance is not a total falsification of the actual world, but it involves gross simplification and distortion. In particular, it presents us with a world in which things appear to be passive rather than active, to be externally rather than internally related to other things, to have no experience, no aim, no self-value. And of course natural science has largely limited itself to this world of appearance—to the world as known through our senses and instruments designed to amplify them. Accordingly, if the world as it appears to scientific study is taken to be the actual world, we get a picture of the world as made of externally related, passive, aimless, valueless bits of stuff. And such a world can clearly provide no intelligible explanations as to why it behaves as it does. Explanation, as opposed to merely descriptive generalization (which is positivism), requires resort to something hidden beneath the appearances. In the modern period, the dominant assumption among those seeking explanations has been that the actual world is composed of entities whose reality is exhausted by their appearances, their effects. What they are in themselves is not thought to be essentially different from what they are for others. This has produced the materialistic-mechanistic world view.

Whitehead, however, decided that actual entities in themselves were subjects, aiming at and realizing value, and being internally related to other actualities in their environments. He does not base this on pure speculation, but upon experience. This depends upon not taking sensory perception as the basic type of perception. More basic is "percep-

tion in the mode of causal efficacy," which involves a direct perception and internalization of other events. At this level of experience, we perceive the actuality of other things, their activity, and some of the values they have achieved. And this perception is not of an object as external; rather, it is a prehension, a grasping of aspects of the object into oneself as material for one's own experience. Hence, Whitehead speaks of a direct interaction among events, but without the image of external, mechanistic relations which the term *interaction* often conjures up.

From a Whiteheadian point of view, Bohm is absolutely right that there is no causation between explicate events, if this term is used to refer to *events as perceived by sensory experience*, which is how Bohm often uses it (Bohm 1980, ix, 158, 186, 206; Bohm 1982b, 92). That world is entirely a product, not a producer. (It has effects only insofar as we act upon the illusory belief that it is the actual world.) And yet, by distinguishing between it and the actual world, we can affirm our deep intuition that there is a direct causal relationship between events, such as between one moment of experience and the next, or between mind and body.

Various levels of actuality in compound individuals. One of the points I have been making is that, although there are several features of Whitehead's vision which correspond to distinctions Bohm makes between implicate and explicate orders, these do not form a hierarchy of levels of existence, a great chain of being, ending in a deepest level in which everything in the higher levels was already implicit.

However, there are a couple of types of hierarchy in Whitehead's thought. These also correspond to notions suggested by some of Bohm's statements.

First, there is hierarchy involved in all compound individuals. The atom is already a hierarchical society, since it is not merely an aggregate of subatomic parts. Rather, inclusive of these parts there is a series of atomic occasions of experience which make the atom into an integrated whole. Molecules can likewise be thought to be unified by molecular occasions of experience. The same can be thought to be true of macromolecules, viruses, and so on. The living cell is dominated by living occasions of experience. Finally, the multi-celled animal is not just a democracy of cells, but has a dominating member, the series of experiences constituting the soul.

Now, when we make a conscious decision, the causation involves all these levels—besides the previously mentioned fact that conscious experience arises to a great extent out of integrations made at a preconscious level. This preconscious experience involved enormously com-

plex integrations of data from various parts of the brain. These parts of the brain are composed of brain cells. The functioning of the cells is partly determined by that of their organelles, and so on, and those in turn by their molecules, and those in turn by their atoms, and those in turn by their subatomic constituents. Bohm uses this as an illustration of the fact that what is implicate in relation to a higher level (e.g., the functioning of brain cells is implicate in relation to the person's conscious decision) is in turn explicate in relation to a lower level (the functioning of the cells is explicate in relation to that of their molecules). This surely points to an important truth.

However, it does not provide an example of a kind of implicate order which modern science has overlooked. This attempt to explain the functioning of organisms in terms of their elementary constituents has been at the heart of the reductionistic drive of modern science. So, this way of employing the implicate-explicate distinction does not provide a parallel to the kind of implicate order which is in principle hidden to the current methods of modern science.

Furthermore, to use the hierarchy in a compound individual as an example of levels of implication suggests reductionistic determinism. To say that our experience is (merely) an explication of what was already implicit in the brain is to reduce the mind to the brain. And if the functioning of the brain cells is likewise said to be an explication of that of their constituent molecules, and so on down, the logical conclusion is that human experience is in principle totally explainable in terms of the functioning of subatomic particles. (And then whether they are thought really to be materialistic particles or world tubes of momentary enfoldings and unfoldings is irrelevant, at least to the issue of human freedom.)

In Whitehead's portrayal of the compound individual, the terminology of implicate and explicate would not be appropriate for the relation between any two levels. The key point again is the universality of Creativity. Individuals at every level have their own degree of Creativity, and hence power for self-determination, vis-à-vis the influences upon them (from above, below, or across). So, individuals at no level are mere explications of what was already implied at some other level. In fact, far from being reductionistic, Whitehead's view implies that individuals at the higher levels have more creative power than individuals at lower levels. For example, although it may be that brain and mind (or soul) have about the same degree of influence upon each other, the soul is at each moment one occasion of experience whereas the brain is composed of billions. This suggests that the soul-experience has billions of times more creative power (to determine itself and then others) than an individual cell-experience. Accordingly,

from this perspective, it would be very misleading to suggest epiphenomenalism by seeing each higher level as an explication of a lower one. (And it would also be erroneous to speak, with Christian Science and other forms of hypophenomenalism, of the lower levels as mere explications of the higher, as if cancer always resulted from a screwed-up psyche and never from a polluted environment.)

Electromagnetic, geometric, and extensive societies. The point of the above discussion is that the hierarchy involved in a compound individual, such as a human being, is a *hierarchy of actualities*, and as such cannot be simply a hierarchy of implication and explication, since all actualities embody self-determining Creativity. However, there is another kind of hierarchy of societies in Whitehead. Whitehead suggests that all of the compound individuals (discussed above) are specialized societies (developed to foster more intense experiences) within more general forms of social order. These latter societies are related in somewhat Chinese-box style, with the less general orders being totally included in more general ones.

The first level of generality, he suggests, is the electromagnetic society, composed of electromagnetic occasions. The order of this society has physical relationships determining the importance of one family of straight lines, one definition of congruence, and systematic law—which is statistical (Whitehead 1978, 98). This society is our present cosmic epoch. It is set within a far wider society, the geometric society, which has those relationships which make straight lines definable and hence measurement possible. But there can be competing definitions of straight lines and hence alternative systems of metrical geometry. So, this geometrical society could be patient of cosmic epochs quite different from our own electromagnetic one. And this geometric society is set in turn within a far vaster society of pure extension. The properties of this most general society express "the mere fact of 'extensive connection,' of 'whole and part,' of various types of 'geometrical elements' derivable by 'extensive abstraction'; but excluding the introduction of more special properties by which straight lines are definable and measurability thereby introduced" (Whitehead 1978, 96-97).

In distinction from the hierarchy involved in a compound individual, this is a hierarchy of abstractions, not of actualities. The point of this hierarchy is not that there is a set of actual occasions anywhere which are only characterized by extensive connection without any more special characteristics. Some more specialized characteristics, such as those specifying ours as a geometric and then an electromagnetic epoch, are necessary. The point is that the less general features are

contingent. Whitehead suggests that the most general level of characteristics, that of pure extensiveness, is probably metaphysical, applying to all possible worlds. (Hence this feature of our world would be parallel to God, Creativity, Eternal Forms, and Creaturehood as such in being an eternally necessary feature of reality.) But there could be creatures whose extensive connectedness was such as to make a different type of geometry important, or even such as to make geometry unimportant altogether. These features of our particular world are contingent. They are obviously compatible with the most general feature of extensive connection. In this sense one could say that the higher, more specialized forms of order were implicit in the deeper levels. But this language would again be misleading. For the more specialized forms of order were not necessitated by the more general. This is again due to the ubiquity of Creativity. Those actual occasions which, billions upon billions of years ago, began exemplifying those forms of order which now dominate our world were not following mere necessity. Some degree of self-determination (probably on the part of both God and the creatures) and hence contingency was involved. The world could have been otherwise. To speak of explication of implicate orders here would mute this contingency.

We can say that the deeper orders are implicit in the higher. The more general is implied by the less general. This shows the limitation of the Chinese-boxes analogy, for the smaller boxes can be removed from the larger without essential loss. But the characteristics of our cosmic epoch, with its laws and dominant family of straight lines, simply would not exist apart from the features making geometry in general important; and these geometric relationships in turn imply extensive relatedness in general. So, the more particular implies the more general, that is, the more general is implicit in the more particular.

So, if we are going to use the language of implicate and explicate in regard to this hierarchy, we would have to say that the more general levels of order were an explication of the more special ones (since they are implied by the more special ones). But no one would want to say this. And since we cannot appropriately say the opposite—that the more specialized are mere explications of the more general—it turns out that the implicate-explicate scheme does not apply at all to this hierarchy of abstraction, just as it failed to apply to the hierarchy of actuality.

Again we see that the key reason is the hypothesis that creativity is the ultimate reality, embodied in all actualities. If Bohm accepts this notion, the implicate-explicate distinction will have to be disassociated from hierarchical notions. There are hierarchical features of the world and there are features of the world illumined by the implicate-explicate distinction. But these are different features.

Conclusion

The status of freedom, causality, and time are in the same boat. The denial of one implies, finally, the denial of the others. If time is unreal, in the sense that from an ultimate perspective there is no distinction between past, present, and future, then there can be no freedom, in the sense of self-determination in the moment. For if what still seems undetermined and hence future right now is in reality already as determinate as the past, then my feeling that I am deciding something in my apparently self-determining activity is an illusion. Likewise, if time is unreal, then there is no real causation, as distinct from logical implication. If the relations of the present with the past and the future are symmetrical, then the present implies the future as fully as it implies the past. Hence we can say that we cause the future only in the same sense as we cause the past, and this empties the word of any meaning.

Likewise, if there is no freedom, then time is ultimately unreal. (Again, I speak of the ultimate reality of time not to reify it as another actuality alongside events, but as shorthand for the ultimate validity of the distinction between past, present, and future.) For if what happens a minute from now, a year from now, a million years from now, was already implicit in the world at this moment, with no genuine alternatives, then time is an illusion. The distinction between past, present, and future is merely an illusion: every event eternally exists, fully determinate. Time is invention or it is nothing, as Henri Bergson said. So if there is no freedom, time is nothing. Similar reflections would show the dependence of causality upon time, and likewise of time and freedom upon causation.

I have suggested that Bohm could formulate his intuition of wholeness without contradicting our deepest intuitions about time, freedom, and causation if he would highlight certain themes already present in his writings and drop others. In particular, the insight that the basic reality is a holomovement, or what Whitehead calls Creativity, should be strengthened, to stress that every event of enfolding and unfolding embodies this self-creative dynamism. Second, God should not be equated with this dynamic activity but regarded as the all-inclusive, intelligent, compassionate embodiment of it. Third, the distinction between implicate and explicate should be limited primarily, first, to the distinction between an event in itself (as subject) and an event for others (as causal superject), and second, to the distinction between the actual world with its enfolding and unfolding and the world as perceived through sensory experience. It can also be helpfully used for the distinction between unconscious and conscious experience, if it is clarified that the conscious aspect of experience is not merely an

epiphenomenal explication of the unconscious depths. Fourth, the hierarchical features of reality should be stressed, but not in terms of the implicate-explicate distinction, since this application would contradict the ultimacy of creativity or holomovement and thereby threaten our deep convictions about time, freedom, and causation.

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