

DAVID BOHM, POSTMODERNISM, AND THE DIVINE

by Ted Peters

Abstract. This is an exposition and critique of physicist David Bohm's theory of wholeness and the implicate order in light of the wider emerging postmodern consciousness. Postmodernity is defined primarily as advocacy for wholistic thinking over against the alleged fragmentation characteristic of the modern mind since René Descartes and Isaac Newton. When Bohm attempts to unite all things in the explicate order with his implicate "multi-dimensional ground," theological questions are raised and, in this article, addressed. The thesis is advanced that there is no whole which presently exists, meaning that the future is presently open, and that the unity of the cosmos awaits the eschatological act of God.

The cosmological speculations of physicist David Bohm represent among other things a probe into what might become the postmodern world of tomorrow. The world of modernity, which Alvin Toffler dubs "the second wave," has dominated Western consciousness since the Enlightenment. That wave is receding now and leaving on the beach the debris of abstract thinking, compartmentalized knowledge, warring specialisms, fragmented facts, and a general sense of alienation between human consciousness and wider reality. A new third wave is about to break upon us, and we are thirsting for it. What we desire is synthetic thinking, a putting back together what we have rent apart.¹ In short, the thirst for postmodernity is the thirst for a renewed sense of the whole.

Bohm thirsts for wholeness, and the reason is that we in the world of Isaac Newton and René Descartes are plagued by a drought because there is fragmentation strewn across the landscape, unnourished by the rains of wholistic thinking. He believes fragmentation is a confu-

Ted Peters is associate professor of systematic theology at Pacific Lutheran Theological Seminary and the Graduate Theological Union, 2770 Marin Avenue, Berkeley, California 94708. He presented this paper at a conference entitled "David Bohm's Implicate Order: Physics and Theology" sponsored by the Center for Theology and the Natural Sciences, Berkeley, California, 22-23 April 1983.

[*Zygon*, vol. 20, no. 2 (June 1985).]

© 1985 by the Joint Publication Board of *Zygon*. ISSN 0044-5614

sion of the mind which creates an endless series of problems and interferes with our clarity of perception so as to prevent us from solving them. We divide subjects and objects and cannot put them back together again. We divide mind and matter, the human and the natural, and we end up with separation and alienation. This way of life has brought about pollution, destruction of the balance of nature, overpopulation, and the threat of worldwide economic and political disorder.

The fundamental cause of this fragmentation is the modern Western habit of divisive thinking, or, more precisely, we assume that the fragmentary nature of our thinking corresponds with an actual fragmentariness indicative of reality itself. "Since our thought is pervaded with differences and distinctions, it follows that such a habit leads us to look on these as real divisions, so that the world is then seen and experienced as actually broken up into fragments" (Bohm 1980, 3; cf. Bohm 1980, xi, 206-7 and Weber 1982a, 71, 76).² Hence, the cure for the ills of modernity must begin with healthier thinking. And, noting that *health* in English is based on the Anglo-Saxon word *hale* meaning whole, healthy thinking will be (w)holistic thinking. This sets the agenda for the Bohm project, namely, to understand the nature of reality in general and conscious thought in particular as a coherent whole (Bohm 1980, ix, 172). It is Bohm's thesis that the explicate order of things which we accept as part of our everyday world and which is studied by modern scientists is itself not the fundamental reality; there is under and behind it an implicate order, a realm of undivided wholeness which is present in each of the explicate parts.

Our task in this paper will be to examine the Bohm cosmology in light of the transition from modernity to postmodernity. We will thank him for trying to put the broken Humpty Dumpty of modernity back together again. In doing so we will amplify his cosmology a bit by drawing some comparisons with a theorist who holds similar views, Arthur Koestler. We will then analyze his concept of the "immense multidimensional ground" in light of theological concerns regarding monotheism and the unity of the whole of reality. We will conclude by thanking Bohm for refraining from labeling his key concept, the holomovement, "God."

BEYOND NEWTON AND DESCARTES

From the point of view of the revisionist or postmodern physicist, the now effete modern mind of the last three centuries is characterized by atomism, mechanism, and objectivism. The problem is not, of course, that the mind thinks objectively about atoms and mechanics; the problem is that it mistakenly assumes that reality itself is so constituted. The

result is fragmentation in the sense that reality is assumed to be composed of separate atomic objects functioning according to mechanical laws, externally related to one another as are subjects and objects. The theories of relativity and quantum mechanics upset this world view a half century ago, because they suggest that "the world can not be analyzed into separate and independently existing parts" (Weber 1982b, 190). This insight is the heart of the new vision which Bohm wishes to explore.

The world view which constitutes the framework of Newtonian physics is based upon the three dimensional space of Euclidean geometry and the notion of the mathematically calculable and constantly reliable flow of time from past to future. In this receptacle of absolute space and time there moves material elements or particles, the small, solid, and ultimately indestructible objects out of which all matter is made. These material atomic units can be located in space and time. Their velocity and size can be measured. They are basically passive, their relationships to one another being determined by external forces of nature such as gravity. These forces or laws of motion presume a closed causal nexus or mechanistic structure. Any definite cause gives rise to a definite effect, and the future of any part of the world system could be, in principle, predicted with certainty should one know the details of the causes. This leads to the image of the world as a machine, to an implicit and rigorous mechanical determinism.

Descartes, usually considered the father of modern philosophy, paved the way for our understanding of the world machine by distinguishing sharply between the world of extended objects out there and the world of subjectivity in here, in our own mind. Despite the thoughts and feelings endemic to human consciousness, we may observe the mechanistic workings of objects in the external world without influencing them as long as we think objectively, as long as we do not personally participate in those workings, as long as we simply conceive accurately in our mind how objects relate to one another. The net effect of Cartesianism over the last three centuries has been for us to separate human consciousness from the world process and, in addition, by concentrating on the plurality of objects to miss seeing the world process as a single process at all.

Big changes came during the first quarter of the twentieth century. Albert Einstein's special theory of relativity dispossessed the framework of absolute space-time, at least when dealing with very high velocity movements that approach the speed of light. Quantum theory similarly disrupted the Newtonian view, perhaps even more so. There are three reasons. The first is that atomic particles such as electrons are not things which can be described by concepts such as location, velocity,

or size. Thought of as particles they travel from one location to another without traversing the distance in between. They move discontinuously. They do not appear to function at all like the material objects we understand at the common sense level. Thus, understanding them as particles of matter can be misleading. It is helpful, say the new breed of physicists, to understand them also as waves or wavicles.

Second, there is no apparent structure of efficient causation belonging to individual subatomic events. We must study them in groups. Individual subatomic events are not predictable and do not even seem to be individually causally determined. What we can do is predict what will happen on the basis of a statistical analysis of a given quantum of atomic activity. In the case of radioactive decay, for example, the point in time in which a particular radioactive atom will suddenly disintegrate is totally unpredictable; but the overall half-life or rate of decay of radioactive substances is knowable. Bohm uses the actuarial predictions of insurance companies as an analogy. Statistical laws predict with a high degree of approximation the mean number of people in a given class of age, height, weight, and so on, that will die of a certain disease in a specified period of time. Even though no one can predict the precise time of death of an individual policyholder, the statistical laws are counted as knowledge.

Third, there are subatomic experiments that demonstrate nonlocal relationships between electrons. Einstein, B. Podolsky and N. Rosen have shown that when two electrons from a single atom have interacted and then flown off in opposite directions, interference with one will instantly affect the other, regardless of the distance between them. This seems to indicate a sort of telepathy between the particles, an intimate interconnection between particles that are not in spatial contact, a noncausal nonmaterial yet influential relationship (Bohm 1980, 71-76, 175).

In short, quantum theory takes us away from a material notion of matter and from a closed nexus of efficient causation, away from a strictly mechanistic picture of the world, away from the world of Descartes and Newton. University of California physicist and popular author Fritjof Capra describes the significance of these new perspectives. "The first three decades of our century changed the situation in physics radically. Two separate developments—that of relativity theory and atomic physics—shattered all the principal concepts of the Newtonian world view: the notion of absolute space and time, the elementary solid particles, the strictly causal nature of physical phenomena, and the ideal of an objective description of nature" (Capra 1977, 50; cf. Capra 1982, 74-78). Arthur Koestler sums it up similarly, "the strictly deterministic, mechanistic world view can no longer be upheld; it has

become a Victorian anachronism. The nineteenth-century model of the universe as a mechanical clockwork is a shambles and since the concept of matter itself has been dematerialized, materialism can no longer claim to be a scientific philosophy" (Koestler 1978, 249-50). And Buckminster Fuller says it in "Intuition":

In short, physics has discovered
That there are no solids,
No continuous surfaces,
No straight lines,
Only waves,
No things,
Only energy event complexes,
Only behaviors,
Only verbs,
Only relationships. . . .

The new physics has brought us to the brink of a new postmaterialist and relationalist era. Where do we go from here? Koestler wants to take these insights into the direction of a wholism that establishes the credibility of parapsychology. Capra is trying to lead the new physics in the direction of Asian mysticism.

Bohm's agenda is not as specific as that of Koestler or Capra; nevertheless, he does have an agenda. Although not wishing to return to a cause-effect determinism, he wants to take us beyond the present state of quantum theory with his own notion of "hidden variables." The problem is that at present there is no consistent notion at all of what the reality might be that underlies the universal constitution and structure of matter. Quantum physicists tend to avoid the issue by concentrating on mathematical equations that permit us to predict and control the behavior of large statistical aggregates of particles, while adopting an attitude that any overall view of the nature of reality is of little or no importance. On this count the practicing quantum physicists are still positivistic and hence still modern, still just calculating the position and momentum of fragments even though the fragments are of a different scale (Bohm 1980, xiii, 75, 175-76).

By focusing on the quantum as an indivisible unit amidst a plurality of such quanta and assuming only indeterminacy within the unit itself, we may miss other hidden factors that might open us to seeing the fundamental unity behind all things. Bohm wants to open us up to those hidden factors by contending that the electron has more properties than can be described in terms of the so-called observables characteristic of quantum theory. There are hidden variables which influence the directly observable behavior of the quantum unit or system. His thesis is that "in a deeper sub-quantum level, there are further variables which determine in more detail the fluctuations of the

results of individual quantum-mechanical measurements" (Bohm 1980, 85). What are these variables? The answer partially proposed by Bohm is to be found as much in philosophy as in physics. While accepting quantum theory as satisfactory for its domain, the search for hidden variables must be pursued in a different domain. They are to be found in reconceiving our world view, in speculating about the underlying unity of the whole of reality. It is to Bohm's specific cosmological speculations that we now turn.

FLOW, FLUX, AND HOLOMOVEMENT

Heraclitus wins! Reality, according to Bohm, is fundamentally "*Undivided Wholeness in Flowing Movement*" (Bohm 1980, 11). This harkens back to the ancient Greek philosophers and their debate as to which is prior, being or becoming. For Parmenides of Elea there is one fundamental reality, being, that is through and through one in kind, homogeneous with itself, uncreated, complete, and unchangeable. Heraclitus, in contrast, gives priority to becoming. All flows. The universe as a whole and everything in it is engaged in perpetual motion, ceaseless process. You cannot step into the same stream twice, he is quoted by Plato to have said (Cratylus 402A). Bohm has taken sides with Heraclitus in this classic debate.

And in doing so, Bohm has sided with one aspect of the modern mind as well. Interpreters of Western culture attest to the triumph of Heraclitus in the age of science. Yale historian of ideas, Franklin L. Baumer, says the "sense of becoming is at the heart of what we mean by modernity, or 'the modern mind'" (1977, 21). University of Chicago theologian Langdon Gilkey says that "for moderns, time is the most fundamental structure of all experienced being. . . . Almost every significant aspect of the modern spirit—its sense of contingency, of relativity, of temporality, and of transience—moves in exactly the opposite direction from the concept of a necessary, self-sufficient, changeless, unrelated, and eternal being" (1969, 54). Although in saying this, we should also note that within the modern period, the triumph of time consciousness occurs in the later phase, more in the nineteenth century, and does not in quite the same way dominate the mindset of Descartes and Newton in the formative period of the seventeenth and eighteenth centuries. Nevertheless, the notion of flowing movement belongs to the modern era, and in itself does not represent something peculiarly postmodern.

What does Bohm mean by it? Flow means that everything is changing. But it is not a single homogeneous or undifferentiated flow, which would be indiscernible from static being. It is rather a flux, a movement of forms and shapes and units. Despite the undivided wholeness

in the overall flowing movement, we can by the tools of thought abstract from it patterns, objects, entities, conditions, structures, and so on, and these will have a certain autonomy and stability. What Bohm wants to stress here is that the flow as an unknown and undefinable totality is prior, whereas the flux of describable events and objects are considered abstractions. This means that our knowledge of the laws of physics deals with abstractions; it deals with events and objects having only relative independence and existence from their ultimate ground in the unknown totality of the universal movement.

It follows that human knowing is both an abstraction from, yet a participant in, the total flux. It is an abstraction because when we focus on either subjective knowing or objective knowledge, we temporarily forget the wider unit that binds them. We mentally extricate them from the single flow of which they are a part. Although the distinction between mind and matter is described by Bohm as an abstraction from a prior unity in the universal flux, such things as mind and matter do exist. But they do not exist by themselves, independently, in isolation; they are each modes of the one common underlying reality. This is not the bifurcated world of Descartes in which thought in the mind views the reality of objects out there, as if thinking consisted in viewing reality as an audience views a drama. Here thought is part of the reality that is the ongoing flow. Because reality is inclusive of thought, reality itself must be thoughtful. It thinks through us. It has consciousness. It belongs to us and we to it. The flow consists in a single holomovement.

HOLOMOVEMENT AND THE IMPLICATE ORDER

There is more than just flow, flux, and consciousness in the holomovement. There is also a microcosm-macrocosm correlation, a sort of presence of the whole within and implied by the part. Bohm's notion of cosmic order as flow is not to be understood solely in terms of a regular arrangement of objects (e.g., in rows) or as a regular arrangement of events (e.g., in a series). Rather, the total order of the holomovement is contained in some implicit sense in each region of space and time. He refers to this as the "implicate order."

Bohm observes that the verb *to implicate* means to fold inward or to enfold, as the term *multiplication* means to fold many times. The implicate ordering of the cosmos means that the total structure is enfolded within each region of space and time. So, whatever part, element, or aspect we may abstract in thought, this still enfolds the whole and is therefore intrinsically related to the totality from which it has been abstracted. "In terms of the implicate order one may say that everything is enfolded into everything. This contrasts with the *explicate order* now dominant in physics in which things are *unfolded* in the sense that

each thing lies only in its own particular region of space (and time) and outside the regions belonging to other things" (Bohm 1980, 177; cf. 149, 185).

Another term for these regions is *subtotalities*. The relationship between subtotalities and the whole is governed by holonomy, that is, the law of the whole. The law of the whole has a looseness about it, permitting a certain autonomy on the part of regions within it. The exact nature of the law of the whole is not known and may even be unknowable, but what we do know is that it includes an overall sense of necessity while avoiding any mechanicalism. "In the holomovement, there is still an overall necessity . . . but its laws are no longer mechanical. Rather . . . its laws will be in a first approximation those of the quantum theory, while more accurately they will go beyond even these, in ways that are at present only vaguely discernible" (Bohm 1980, 181; cf. 156). The net effect of holonomy is to establish the implicate order, to foster subtotalities which provide access to the whole.

MANIFESTATION AND THE EXPLICATE ORDER

Although the nonmanifest implicate order is primary, the explicate order of manifestations perceptible through the human senses is authentic for Bohm. What is manifest is literally what can be held with the hand—something solid, tangible, and visibly stable. The manifest world consists in the external unfolding or explication of the implicate order. The holomovement emits of "verration," that is, the act of perceiving truth as well as attending to what truth means (Bohm 1980, 42). In other words, the forms of flux themselves do not leave us abandoned in a world of illusion. Illusion occurs only when we mistake the forms of flux for the fundamental reality, that is, when we assume that what is explicate is all that there is. "What is is the holomovement and . . . everything is to be explained in terms of forms derived from this holomovement. Though the full set of laws governing its totality is unknown (and, indeed, probably unknowable) nevertheless these laws are assumed to be such that from them may be abstracted relatively autonomous or independent sub-totalities of movement (e.g., field, particles, etc.) having a certain recurrence and stability of their basic patterns of order and measure" (Bohm 1980, 178; cf. Weber 1982, 204).³

Bohm believes that the notion of an implicate order becoming explicate gives a more coherent account of the quantum properties of matter than does the traditional mechanistic order. For example, it solves the problem of discontinuities in the track of an electron particle. Where the electron seems to pass from one state to another without traversing the states between, Bohm can say this is possible because the

electron itself is only an abstraction from a much greater totality of structure. If we assume that the electron as a particle is the primary reality, then it appears to drop out of existence and then come back into existence. But this is something impossible. However, if we assume a hidden implicate order to be the primary reality, and that this implicate order provides the continuity, then we can accept that what is manifest to our senses (or to laboratory instruments) does not itself have continuous movement or continuous existence. The disappearance and re-appearance of the particle represent multiple projections of a single higher-dimensional movement, the unfolding and enfolding of the single more comprehensive holomovement.

Scientists may very well study the manifest explicate order of electron particles and even employ mechanistic concepts as far as they are helpful, according to Bohm. But they should avoid the mistake of assuming that the explicate order is the fundamental reality. Science here, understood as the human process of pursuing knowledge, ought not to begin from an examination of the parts and then attempt to derive all wholes through abstraction, explaining wholes as simply the results of interactions of the parts. "On the contrary, when one works in terms of the implicate order, one begins with the undivided wholeness of the universe, and the task of science is to derive the parts through abstraction from the whole, explaining them as approximately separable, stable, and recurrent, but externally related elements making up relatively autonomous sub-totalities, which are to be described in terms of an explicate order" (Bohm 1980, 179). We have a move here from one point of departure to another that parallels the move from nominalism to realism, from beginning with the part to beginning with the whole. Some might say that it represents a move from physics to philosophy. It may also represent a move from the modern to the postmodern.

PART, WHOLE, AND HOLARCHY

A question we might pose at this point is: What is the relationship between the parts and the whole? In one sense Bohm resists any sort of hierarchy of relationships; there is no great chain of being from lower to higher. Animate matter is not a higher form of being than is inanimate matter for him. To say that inanimate matter is dead or that it exhibits no intelligence is not to place it lower on the ladder of being. It is rather to think abstractly (Weber 1982b, 191). Bohm begins with the whole of matter and he holds that this whole unfolds itself—becomes explicate—in a variety of media, some intelligent and some not, some conscious and some not. To focus our attention on either the animate or the inanimate is to abstract, to divide and separate by means of

thought. Yet in saying this Bohm does not want to say that abstract thought is simply illusion. There really is an implicate order making itself explicate. He is not a simple monist believing that the parts are swallowed up in a mystical blur. It is really the case that the whole is immanent in the parts.

Consequently, we might press the question of the relation of whole and parts in the explicate order. Will a strictly inanimate part contain the whole which has animate qualities? Bohm seems to answer this indirectly with his notion of region or subtotality. It should follow from the above that a subtotality would necessarily contain both animate and inanimate dimensions if it is authentically to re-present the whole. However, Bohm describes inanimate matter as a relatively autonomous subtotality in which life is not manifest. This raises questions. If life is characteristic of the whole but not the inanimate subtotality, then how can the whole be wholly present in the subtotality? Is life left out? Or is it just not manifest? Does he mean to say that life is present implicately even when only inanimate matter is explicate? If so, then how do we know? By faith? That is, do we believe in the nonmanifest whole even when it is not manifest? In addition, we wish to ask about the relationship between various subtotalities. Do they relate directly and solely to the whole, or is there an intermediate relation which they share with one another that qualifies their relation to the whole?

We might refer briefly here to the work of Koestler, whose cosmology at this point seems to run somewhat parallel to Bohm's. What Bohm refers to as a subtotality corresponds roughly to Koestler's notion of the holon. Like Bohm, Koestler is seeking a wholistic world view. He defines *holism* as the belief that the whole is more than the sum of the parts, and in modern physics it consists in the insight that the whole is as necessary for understanding the parts as the parts are necessary for understanding the whole (Koestler 1978, 26, 256). A whole is considered something complete in itself which needs no further explanation. The whole-part relationship, contrary to widely held thought, is not just that. There are no completely distinguishable parts and wholes in any absolute sense; they mutually define and depend on one another. Furthermore, all things are held together by an intermediate reality, the subwhole or "holon." The holon is a stable, integrated structure, equipped with self-regulatory devices and enjoying a considerable degree of autonomy, of self-government.

Holons are part of an inclusive hierarchy. Koestler offers the example of cells of tissue and the heart. Each cell is capable of functioning in vitro as a quasi-independent whole. The heart is made up of such cells, but it too is a quasi-independent whole, functioning according to its own somewhat autonomous principles. Each of these are subwholes

which function as subordinated parts of yet a more inclusive whole, namely, the human organism. "The term 'holon' may be applied to any stable sub-whole in an organismic, cognitive, or social hierarchy which displays rule-governed behaviour and/or structural Gestalt constancy" (Koestler 1978, 293; cf. 26-27, 37, 304). Koestler's concept of the holon serves to supply the missing link between atomism or fundamental pluralism, on the one hand, and a holism which swallows everything individual up into mystical absorption, on the other.

Koestler's holons recall the mythical god Janus, that is, holons face two directions within the holarchy, internal and downward as well as external and upward. Internally, the holon integrates its parts into itself as a whole. Externally, it is self-assertive, preserving its individual identity, while it itself becomes integrated into a more inclusive hierarchy. Holons "are Janus-faced. The face turned upward, toward higher levels, is that of a dependent part; the face turned downward, towards its own constituents, is that of a whole of remarkable self-sufficiency" (Koestler 1978, 27; cf. 301).

It seems that Bohm would probably follow the Koestler development, agreeing that the concept of subtotalities denies that the whole of reality is simply an aggregation of elementary parts. The whole determines the parts as much as the parts determine the whole, perhaps even more so for Bohm. And at times Bohm will speak of an infinite regress of implicate orders, wherein a given order will be implicate to the explicate order dependent on it, and at the same time it itself will be explicate to a higher order which is its implicate. This parallels roughly Koestler's holarchy.

But there are some contrasts. Bohm does not apparently develop the notion of holarchy with reference to the explicate world, which appears to be what Koestler does. Koestler proffers a broader application of the notion by stating that holarchy applies not just to the realm of subatomic physics but also to biological and social organisms. In addition, Bohm may be asking more from his subtotalities than Koestler does. To get from the part to the whole in Koestler's holarchy one must climb the ladder one holon at a time until reaching the comprehensive top. Whereas for Bohm, in contrast, one goes directly from part to whole and back again. Bohm holds that access to one subtotality or integrated region provides us with a material door that opens directly out onto the whole, that the very nature or character of the largest whole can be revealed in the smallest holon.

THE IMMENSE MULTIDIMENSIONAL GROUND

Now we ask of Bohm: What is the nature of the whole itself? For starters, it is not limited to the four dimensions of space-time common

to our everyday experience. Electromagnetic fields which obey the laws of quantum theory have already provided us with one example of reality that transcends the four dimensional frame of reference. And, Bohm argues, quantum theory in turn is limited to a certain domain so that hidden variables must be sought elsewhere, providing us with a second example. In short, "the implicate order has to be extended into a multidimensional reality. In principle this reality is one unbroken whole, including the entire universe with all its fields and particles. Thus we have to say that the holomovement enfolds and unfolds in a multidimensional order, the dimensionality of which is effectively infinite" (Bohm 1980, 189).

Occasionally Bohm refers to this as a background reality of "higher dimensional" space. What does he mean here? Could it be a form of space that transcends yet is inclusive of our three dimensional space? What are the alternatives? One alternative is to conceive of the inclusive background reality as an empty receptacle, as a void. There are pre-modern precedents for this conception which became dominant during the modern period. Leucippus and Democrates divide material being into a plurality of imperceptibly small atoms (*atomoi*), each one eternal and indivisible. These atoms can be separated from one another and relate to one another because they are set within a wider background of empty space, the unlimited (*apeiron*). Because true being is associated with the atoms and not with the empty receptacle, the spatial background itself cannot function as a cause or influence in the material world; it is only present due to its absence.

The other alternative is to fill the background with being. For this alternative we can thank both Parmenides and Heraclitus. Bohm, curiously enough, identifies himself with the school of Parmenides in holding that space is a filled plenum (Bohm 1980, 191). Space is a filled plenum for Parmenides because outside it there can be only nothing. "What is, is," he writes, which implies that there is no such thing as empty space either within or outside the being of the world. All things are finally reduced to one thing, and that great One is described as never having come into being from a previous state of nonbeing. It is eternal, imperishable, unitary, and complete. Parmenides goes on to argue that if there is a single substance behind all things, then the concept of change is logically absurd and the phenomenon of change is an illusion. To get beyond opinion to truth is to get beyond illusory change to eternal and unchangeable being.

One would think Bohm would be more interested in Heraclitus than Parmenides on this score. With Heraclitus Bohm could have both fundamental unity plus change. According to Heraclitus, there is only one basic reality in the world which is the source for all things, and the

process by which this reality becomes a plurality of things is the process of change. The never-ending flux consists in differing forms of a continuing single reality variously described as fire, logos, or God. Materially conceived, all things are a different form of the ever-living fire. Rationally conceived, all things are expressions of the divine. Because God is reason (*logos*) and since God is the One which permeates all things, pantheist Heraclitus holds that all things move and change in accordance with the logos as the universal law immanent in the process. What we perceive to be disorder and strife between opposites will ultimately find a higher harmony in the ongoing life of the divine unity.⁴ In addition to comprehensive unity and flux, Heraclitus should also have appeal for Bohm because his unifying reality, God, has the ability to influence individual events.

How does Bohm describe his own notion of the filled plenum? He describes it as a sea of energy. The forms of the flux appear as ripples or wave patterns on the surface of this sea. "What is implied by this proposal is that what we call empty space contains an immense background of energy, and that matter as we know it is a small quantized wavelike excitation on top of this background, rather like a tiny ripple on a vast sea. . . . this vast sea of energy may play a key part in the understanding of the cosmos as a whole. . . . what we perceive through the senses as empty space is actually the plenum, which is the ground for the existence of everything, including ourselves" (Bohm 1980, 191-92). The sea of energy is immense. So immense that when Bohm discusses the big bang theory of cosmogenesis, he says "this big bang is to be regarded as actually just a little ripple" (Bohm 1980, 192). The whole twenty billion year history of the multi-galactic cosmos is just a little ripple! When Bohm says his sea of energy is immense, he means it.

Bohm's plenum is not to be conceived as a material medium such as Heraclitus' fire or the nineteenth-century concept of a pervasive ether, both of which were regarded as moving only in three-dimensional space. Bohm wants more. This energy sea is to be understood in terms of a multidimensional implicate order, while the universe of matter manifested to our sense experience is to be treated as a comparatively small pattern of excitation. This excitation pattern is relatively autonomous and gives rise to our experience of subtotalities and the notions of three dimensional and quantum space.

From this point on, Bohm's multidimensional sea of energy begins to pick up character and personality. As we mentioned before, because this grand reality is inclusive of human consciousness—which Bohm takes to include thought, feeling, desire, will, and so on—in itself it cannot be less than conscious. The holomovement must be the source of life and itself be living. Furthermore, the absence of life is dubbed by

Bohm as an abstraction. "In its totality the holomovement includes the principle of life as well. Inanimate matter is then to be regarded as a relatively autonomous sub-totality in which, at least as far as we now know, life does not significantly manifest. That is to say, inanimate matter is a secondary, derivative, and particular abstraction from the holomovement" (Bohm 1980, 195).

Bohm like other postmodernists is striving to get beyond the dualism bequeathed us by Descartes, for whom consciousness or "thinking substance" is sharply distinguished from matter or "extended substance." The problem this dualism creates is that we need a basis for relationship between matter and consciousness. Descartes clearly understands this difficulty and proposes its solution with his doctrine of God. God, being transcendent to both matter and consciousness, is able to provide clear and distinct ideas to consciousness that correspond to extended objects. During the intervening centuries since Descartes the notion of God has dropped out of modern cosmology, leaving the now divorced mind and matter to go their separate ways. Bohm wants to reunite them with a common higher-dimensional ground, and so his notion of holomovement performs the job done by God in Descartes' system (Bohm 1980, 196-97).

In uniting mind and matter the holomovement is not simply passive, waiting for conscious thought to manipulate it. Bohm says it projects. It presses itself into human consciousness through memory, wherein a single moment consists in the co-presence of a series of interpenetrating and intermingling elements in different degrees of enfoldment. Bohm is making the startling claim that human memory is not the projection of subjectivity out toward the world but rather the projection of the world itself into our subjectivity. The holomovement actively prompts human consciousness.

Thus each moment of consciousness has an explicit content, which is a foreground, along with an implicit content, which is a corresponding background. But the holomovement here is not restricted to the implicit background; it also manifests itself in the explicit foreground. It projects its own implicate order in the process of becoming the explicate manifestation. "The more comprehensive, deeper, and more inward actuality is neither mind nor body but rather a yet higher-dimensional actuality, which is their common ground and which is of a nature beyond both. . . . In this higher-dimensional ground the implicate order prevails. Thus, within this ground, *what is* is movement which is represented in thought as the co-presence of many phases of the implicate order. . . . So we do not say that mind and body causally affect each other, but rather that the movements of both are the outcome of related projections of a common higher-dimensional ground" (Bohm 1980, 209).

And Bohm goes still further yet in his concept of projection. He says the inclusive ground is creative. "Such a projection can be described as creative, rather than mechanical, for by creativity one means just the inception of new content, which unfolds into a sequence of moments that is not completely derivable from what came earlier in this sequence or set of such sequences. What we are saying is, then, that movement is basically such a creative inception of new content as projected from the multidimensional ground. . . . This we may call the ground of all that is" (Bohm 1980, 212).

In sum, the all-inclusive holomovement can be understood as the sea of energy or the multidimensional ground from which all things derive. It is living. It actively projects its own implicate order in and through human consciousness, thereby becoming manifest and explicit. In doing so it is creative, because what it unfolds in a sequence of moments is not simply derivable from what came earlier.

HOLOMOVEMENT AND HOLES IN THE ARGUMENT?

One might ask at this point if Bohm has fallen into the fallacy of composition when one reasons without warrant from the properties of the parts to the properties of the whole. The whole, if understood as more than simply the sum of its constituent parts, will have a character or integrity of its own that is not simply the transfer of the character of the parts; it will be a composition and not merely an aggregate. A particularly flagrant example of the fallacy which appears in logic textbooks is the argument that if every part of a certain machine is light in weight, then the machine as a whole is light in weight. The error is that the machine may contain a very large number of parts and may as a whole be quite heavy. In the case of Bohm's holomovement, he argues that because individual human beings are conscious, therefore, the universe as a whole is conscious. Does it follow necessarily that if the individual parts are conscious—which implies intelligence, self-awareness, identity over against other identities, and so on—that the whole qua whole has a parallel consciousness? It is in principle possible that the whole is as Leucippis and Democrates thought it is, namely, an empty receptacle containing individual atomic units. Instead of a whole the cosmos might be simply an aggregate, a large collection of individual entities some of which are conscious.

Bohm, of course, means what he says. He understands the holomovement on the model of the hologram. The term *hologram* is derived from the Greek *holo* meaning whole and *gram* meaning to write. Holography is the construction of a kind of three-dimensional picture produced by lensless photography. By letting light fall on a photographic plate from two sources (from the object itself plus from a reference beam, which is light deflected by a mirror from the object onto the plate) a three-

dimensional likeness can be reconstructed. What is important for the present argument is that every part of the resultant hologram contains the entire image. If the hologram is broken, any piece of it will reconstruct the whole. This is the model for the universe employed by Bohm in his notion of the holomovement (Bohm 1980, 145, 177). The whole is fully present in the part.

But we might ask whether or not there might be some fallacious reasoning involved. In this case it would be the reverse of the composition fallacy, namely, the fallacy of division when the properties of the whole are attributed without warrant to the parts. An example would be to argue that because a million dollars has a lot of buying power so also does each dollar have a lot of buying power. According to the holographic model the qualities of the whole seem to be present without remainder in each of the parts. Yet wholistic thinking ordinarily requires as one of its premises that the whole is greater than the sum of the parts—or, to phrase it more accurately, that the whole has an integrity (integrating power) of its own. This is something which the parts on their own do not possess. This premise would permit the influence of the whole to be present in each of the parts, but the whole itself would not be exhausted in each of the parts. The problem of the parts for Bohm is just that they are parts, that is, they are perceived and thought of as separate and distinct from one another. What Bohm wants to affirm is unity, wholeness. Whatever unity or wholeness there is, then, is a quality that by definition belongs not to the parts but to the whole. The parts even just formally cannot contain all the qualities of the whole. It seems that the holographic model might be leading Bohm away from his target, because this model implies that all of the qualities of the whole are exhaustively present in the part.

IS THE HOLOMOVEMENT DIVINE?

Could we consider the holomovement divine? Bohm refers to it as the "higher-dimensional ground" of all things, the implicate order underlying the explicate order, or even the nonmanifest which moves what is manifest. Corresponding notions in the philosophies of Descartes and Spinoza are labeled God. What functions as God and the divine subjective aim in Alfred North Whitehead's system has an ordering responsibility akin to Bohm's implicate ordering. John B. Cobb, Jr. can refer to Whitehead's God as an "energy-event" which gives rise to both matter and human consciousness (Cobb, Jr. 1969, 71). Hence, should Bohm wish to attribute divine qualities to the holomovement there would be some precedent.

But Bohm hesitates to follow this precedent. He is willing to speculate on the nature of the implicate order, but then he adds a caution:

"we have to be careful not to linger on that too long" (Weber 1982a, 71, 83). He wishes to keep theological speculation to a minimum.

Bohm is willing to describe the implicate order as holy but is a bit less willing to describe it as sacred. The term *sacred* has an etymological history going back to ancient religious sacrifice, and this makes Bohm nervous because it is too closely associated with organized religion. The term *holy*, in contrast, comes from the same root as *whole*; therefore, he is quite happy thinking of the whole as holy (Weber 1982a, 69-70; 1982b, 194).

In doing so we are a long way from formulating what looks like a doctrine of God. The implicate order for Bohm is matter, not spirit. The term *spirit* in languages such as Hebrew and Greek means breath or wind. It became associated with the divine because, though in itself it was not manifest, it appeared to move what is manifest when blowing things around. Modern science upset the phenomenological basis for such a theology, however, by discovering that breath and wind are themselves matter. All this brings Bohm to the frontier of theology without crossing over. "All we can say is that this view is consistent with the notion that there's a truth, an actuality, a being beyond what can be grasped in thought, and that is intelligence, the sacred, the holy" (Weber 1982a, 70).⁵

In thinking this way Bohm follows other philosophers who have similarly hesitated at this point. Parmenides, whom Bohm mentions, refrained from referring to the plenum as divine and may even have refrained from referring to it as being. Parmenides' phrase *estin a ouk estin* is grammatically ambiguous, so that it can be translated either "it is or it is not" or "what is, is." The rendering "it is" makes one ask what *it* is referred to here. Some translators answer: being. The term for being, *eon*, appears in other Parmenidean texts, but not here. Why? And why does he avoid the term *god* which was so commonly used by other presocratic thinkers? Eric Voegelin speculates that it is because of a mystical tendency in Parmenides and that the term *god* is typically used to refer to an object of thought. "We suspect that there was a good reason for the hesitation to use the subject *Eon* and that in this hesitation the true philosophical genius of Parmenides reveals itself. . . . To name the subject 'God' as is done in Christian theology, is a convenience, but quite unsatisfactory in critical philosophy. With great circumspection Parmenides has resisted the temptation of calling his Being God. . . . The progress on the way toward the light culminates in an experience of a supreme reality that can only be expressed in the exclamatory 'Is!'" (Voegelin 1957, 210-11). Although it is worthy of note that Parmenides did not dub his unifying reality divine, it may have been for reasons that do not apply to Bohm. If Voegelin is correct that

creative work. The cosmological speculations of theorists such as Bohm raise the kind of issues that prompt questions about monotheism.

Monotheism is the belief in one God as the ultimate reality that normally includes a distinction between God and the created order which is not sufficient unto itself. Even if we conceive of it as a whole, as the totality of finite reality, we must recognize that we can then conceive of something outside or beyond it. In fact, wholes which we have experienced (Bohm's subtotalities) are constituted as specific wholes by being separated from something else, by drawing the line between what is integrated and what is left outside, by distinguishing one totality from another. Unless the cosmos be an exception to the rule, a transcendent God is required for it to attain its own wholeness.

Christians have historically made certain commitments regarding such a doctrine of God that usually puts them in the camp of monotheism. The primary religious sentiment is to affirm that God is the ultimate reality. Regardless of how it is rationally depicted, this affirmation of God's ultimacy is expressed by Paul for whom God is all in all (1 Cor. 15:28), by Augustine's doctrine of *creatio ex nihilo*, and by Anselm's notion of God as "that than which nothing greater can be conceived." Note, for example, how H. Richard Niebuhr communicates this sense of divine ultimacy when depicting "radical monotheism."

For radical monotheism the value-center is neither closed society nor the principle of such a society but the principle of being itself; its reference is to no one reality among the many but to One beyond all the many, whence all the many derive their being, and by participation in which they exist. As faith, it is reliance on the source of all being for the significance of the self and of all that exists. It is the assurance that because I am, I am valued, and because you are, you are beloved, and because whatever is has being, therefore it is worthy of love. It is the confidence that whatever is, is good, because it exists as one thing among the many which all have their origin and their being, in the One—the principle of being which is also the principle of value (Niebuhr 1943, 32).

For Niebuhr radical monotheism has to do with the ultimate being and value of all things. It is also more. That "one beyond all the many" Christians call God.

It is in principle possible to solve the problem of the relationship between the one and the many without recourse to the Christian God. A monism would do. Monism is the view that the plurality of things in the phenomenal world are ultimately part of a single reality. Parmenides and Heraclitus provide us with examples. In more recent times monism has become attractive as a tool for overcoming the dualism of mind and body, because one can posit a more primary reality of which both mind and body are modes. This seems to be what is attracting Bohm.

Parmenides was a mystic and that mystic reality transcends divinity, we should note that Bohm does not seem to develop his notion of the multidimensional ground in a traditionally mystical direction. There is a hint of mysticism, although he restricts himself to scientific and speculative procedures and avoids any appeal to direct mystical experience or to mystical philosophy. Bohm's theory of the implicate order is a theory about matter, not spirit. Should there be a realm of supramatter beyond the holomovement—which the Bohm theory does not forbid—then the discussion would be open for religious speculation. In the meantime, there is no mixture of physics and theology in Bohm's work (Wilber 1982, 168-69).⁶

Another reason that might be given for avoiding the attribution of divinity to the holomovement is that in doing so we might fall into the god-of-the-gods trap. Koestler, whose position is quite similar to the one under discussion, is cautious here while being critical of Bohm's hidden variables theory.

Einstein, de Broglie, Schrödinger, Vigier, and David Bohm, who were unwilling to accept the indeterminacy and acausality of sub-atomic events . . . were inclined to believe in the existence of a sub-stratum below the sub-atomic level, which ruled and determined those seemingly indeterminate processes. This was called the theory of "hidden variables"—which, however, has been abandoned even by its staunchest supporters because it seemed to lead simply nowhere.

But although unacceptable to the physicists, the hidden variables provided a fertile field for metaphysical and parapsychological theorizings. Theologians proposed that Divine Providence might work from within the fuzzy gaps in the matrix of physical causality ("the god of the gaps") (Koestler 1978, 250-51).

Although Bohm does not advocate a god-of-the-gaps position, he does advocate something parallel: a ground-of-the-gaps or holomovement-of-the-gaps position. The Newtonian physics of the modern era and the quantum physics of the approaching postmodern era have left gaps that Bohm wants to fill. The fragmentation of modern thinking and its corresponding breakdown of social and natural relationships has sent Bohm on a search for a wholistic actuality which can unite the fragments. He has not sought out divine revelation or even mystical experience but has sought rather to observe what is manifest in the explicate order, to observe the spatial gaps between what is explicate, and then to render a synthetic judgment positing an all-inclusive and implicate order belonging to the whole of reality.

Whether or not Bohm himself engages in theological inquiry, we must recognize that talk about the whole suggests talk about God. To raise the question of the whole of reality is to ask about the divine. In Jewish and Christian tradition all that is real is the product of God's

The problem with monism in all its forms is that it denies the Christian belief in a radical distinction between God and the creation. This distinction functions to affirm divine ultimacy. God transcends the world. This means among other things that the creature can never become totally divine. Although God as immanent can and does participate in the creation, that which has been created will remain the created.

The distinction between God and the creation has two corollaries in Christian monotheism. First, God is not thought of as simply a craftsman who molds and shapes and directs an already existent world stuff. Rather, God creates *ex nihilo*, out of nothing. He summons the universe into existence, and should he not so summon it then there would be only God.

Second, the created realm is entirely dependent upon God as the source and power of its continued existence. We have a part in the universe not by some natural right, but only by the grace of God. Life is a gift. The proper creaturely response is to be thankful (Hick 1973, 8). The purpose of Bohm's *Wholeness and the Implicate Order* is not to render thanksgiving for the cosmos, of course. But perhaps the theological reader can be thankful that Bohm successfully avoids a clash with Christian theology that would result from dubbing the holomovement divine.

HISTORY AND THE WHOLE

There is another related issue: Can Bohm's holographic microcosm-macrocosm correlation be made compatible with the Christian emphasis on historical reality? The idea that reality is history and that such things as creativity and irrevocable change occur within history is an idea that modernity shares with ancient Israel and the New Testament. Because of the movement in holomovement, it would seem that Bohm is accepting of the modern understanding of reality as processive, temporal, and historical. But just how far is he in fact willing to go with this? Speculations on the microcosm-macrocosm correlation have a tendency to deny genuine historicity to events, to dissolve everything into a timeless unity. When he speaks directly to the issue, he speaks of time in the holomovement in terms of "recurrence" on the analogy of the changing seasons (Weber 1982a, 89-90).

Bohm's notion of implicate causation carries his theory in the direction of an achronic or suprahistorical whole that minimizes the importance of the course of individual events. In the explicate order current events do not cause or influence future events directly; each event is enfolded into the implicate order, into the whole. The next or subsequent event emerges from the implicate order and is not the direct

product of its predecessor. All of history is analogous to a movie film. Each frame is a still picture, but due to its speed through the camera we perceive the movie as continuous. So also in history each event is a unit unto itself produced by the implicate order becoming explicate. It only appears to be a sequence of causally related events. To exaggerate a bit: in order to kick the dog one must first kick the implicate order and then the implicate order kicks the dog; and then in a subsequent event it prompts the dog to yelp. Kicking, feeling the kick, and yelping all belong to the immense multidimensional whole and simply become explicate at arbitrary times. It just appears to us that they are causally related.

The advantage in such a theory is that we are no longer the victims of a strict nexus of efficient causation. Individual events are related to the whole. Should one want to describe divine activity in the ordinary course of events, the concept of the implicate order might be a vehicle for doing so. However, there may be a disadvantage as well. By eliminating entirely the direct continuity between the sequence of events, temporality and historicity risk being swallowed up in the achronic abyss of the implicate order.

There are grounds for taking history seriously in both natural science and theology. It has been traditionally assumed that history belongs peculiarly to the human condition and that nature functions in some achronic realm, subject to unchanging laws. What is beginning to dawn on modern consciousness is the comprehensiveness of the category history. Nature too is historical. It is not timeless. Astrophysicist C. F. von Weizsacker argues the point forcefully. "Man is indeed a historic being, but this is possible because man comes out of nature and because nature is historic herself. . . . History in the broadest sense is the essence of what happens in time. In this sense, nature undoubtedly has a history since nature herself is in time. History of nature, then, would be the totality of what happens in nature" (von Weizsacker 1966, 7). If von Weizsacker is correct, that the natural realm is historical and hence subject to newness and to irrevocable changes, then the whole of nature is not directly accessible through mental holography or microcosm-macrocosm correlation, nor is temporal passage a totally discontinuous product of a supratemporal whole.

If one were to take history seriously, so that what is engaged in temporal passage is understood as what is real, and if one were similarly open to the future and to the possibility of a genuinely new reality resulting from the processes, then one would have to deny that the whole of reality presently exists anywhere. Even if the whole of space were present, certainly the whole of time would not be. In any given moment in which one focuses on one of the parts, the whole could not

become present in any complete sense. It could not do so because it is not yet the whole which it someday will be. There cannot be a microcosm which fully represents the macrocosm, because the macrocosm is itself still in process, still becoming, still incomplete. To assert that the whole is fully present holographically implies a denial of temporality; it implies that reality as a whole is achronic and unchanging. The only authentic way in which the whole can become present in the part is for the final future to become present in the moment.

Bohm believes he handles this problem by distinguishing between flowing "wholeness" and static "totality." Totality includes the notion of completeness. What is whole, in contrast, is incomplete (Weber 1982b, 203). By the whole he is referring to what is at the present moment in its incompleteness and without regard to its future. But, we might ask, What kind of a whole is it that is an incomplete whole? Can the whole understood this way be equated with what is real? Is not the future of the holomovement constitutive of its reality? Is not Bohm himself doing what he has warned us against, namely, abstracting and isolating the present whole from the more inclusive reality?

The concept of totality is not necessarily static as Bohm believes. If it includes the aspect of temporal passage, then totality is located in the future and stands over against the present in creative tension. It constantly draws the present beyond itself towards ever new reality, towards fulfillment. Without the notion of future totality, the notion of wholeness is abstracted from time and becomes vacuous.

At the present moment the totality of reality does not exist anywhere in its completeness. We can only anticipate it. In fact, that is what we do. In isolated moments of meaningfulness, we implicitly anticipate the completed whole, the total reality which will finally put all things into their respective place. To see meaning in the present moment is an act of unconscious faith. It is an act of trust that the future will confirm and extend the meaning we presently perceive and experience.

There may be deep mystical experiences which give an individual a sense of cosmic unity. There also may be theories such as Bohm's which posit at the level of metaphysical discourse belief in cosmic unity. They are not holograms in the sense that they reveal a presently existing wholeness to all things. Rather, such experiences and theories are proleptic, that is, they anticipate future wholeness. Ordinary events—as well as mystical experiences and metaphysical theories—are both causative and yet open to the future, making them reciprocally related to the future whole. Present events, or parts and subtotalities, gain their own present identity from the final future of all things; and the final future will be determined in part by present events. Meaningful events

may be revelatory, that is, they may manifest wholeness; but they do so not because they are microcosms of the whole. They do so rather because by faith we recognize their dependence upon the whole to make them what they are. They point to the whole while not in themselves embodying all that the whole will ultimately include. Instead of holograms we should speak of proleptograms.

Theologian Wolfhart Pannenberg contends that the essence of all things is yet to be determined. It will not be determined until the eschatological future. The meaning we find in the present moment is dependent upon an implicit faith that includes a fore-conception of what is to come. "Only from such a fore-conception of a final future, and thus of the still unfinished wholeness of reality, is it possible to assign to an individual event or being—be it present or past—its definitive meaning by saying what it is. Thus, when someone names a thing and says, 'This is a rose,' or 'this is a dog,' he always does so from the standpoint of an implicit fore-conception of the final future, and of the totality of reality that will first be constituted by the final future. For every individual has its definitive meaning only within this whole" (Pannenberg 1970-71, 2:62; cf. 1:156-57, 229-30).

It is at the point of this defining whole in the final future that we will find God. All events are moving ahead to meet a common future, a common future that is the reality of God. There is no whole at present. There really does exist separate subjects and separate objects and the consequent uncertainty in human knowing. We must live in part by faith and in part by reason until the process is complete, until the advent of God's consummate future, at which time faith and reason will themselves be united.

CONCLUSION

In conclusion, theologians should give ear to what Bohm is saying because he is raising a scientific voice in behalf of the widespread yearnings for wholeness that characterize the emerging postmodern consciousness. Postmodernity has yet to make it on the agenda of contemporary theologians. So preoccupied have the church's twentieth-century intellectuals been with making the gospel relevant to the modern mind, that they have scarcely noticed that the modern mind itself is now breaking down and giving way to something new. When postmodernity finally does begin to draw the belated attention of the church, we can expect that one of the first things systematic theologians will do is search for a philosophical system that is both authentically postmodern and potentially compatible with the Christian faith. At that time Bohm's scientific theory will quite likely be

considered as an aid to theology in a manner parallel to the roles previously played by the systems of Aristotle and Whitehead.

It is with this possibility in mind that we have raised a few theological questions and suggested some cautions. Although Bohm's cosmology might very well become allied to Christian theology in the mind of some theorists, it is fortunate at this point that Bohm has refrained from simply labeling his holomovement "God." Whether by accident or design he shows wisdom in following Parmenides in this regard. To call it God would be to produce another god of the philosophers, a divine principle posited to save the other principles of the system from collapse. It would be a god-of-the-gaps philosophy. Now there is nothing in principle wrong with a god-of-the-gaps philosophy, especially if it is done with coherence and elegance. The problem from the Christian point of view is that once one is secure in a sound system with a built-in divinity, then one's ears are less likely to be open to the revelatory word coming from the transcendent God himself, the word that takes us beyond every system into the as yet open future.

NOTES

1. Toffler writes, "Today I believe we stand on the edge of a new age of synthesis. In all intellectual fields, from the hard sciences to sociology, psychology, and economics—especially economics—we are likely to see a return to large-scale thinking, to general theory, to the putting of the pieces back together again" (1980, 146). Bohm's work represents one of the attempts at large synthetic thinking.
2. Bohm's position here regarding the self-deception created when we mistakenly assume conceptual distinctions are fundamental to reality itself seems to be at minimum an attempt to avoid Whitehead's fallacy of misplaced concreteness and at maximum a flirting with Asian mysticism wherein the phenomenal world of multiplicity and distinction is illusory.
3. The degree of reality attributed to concrete experience with distinction and multiplicity is not clear here. The option taken by Asian philosophy—an option at times resisted by Bohm—is to treat the explicate order as illusion. New Age commentator Marilyn Ferguson employs the work of Bohm along with that of Karl Pribram of Stanford University in speculating on a microcosm-macrocosm correlation following the holographic model. "If the nature of reality is itself holographic, and if the brain operates holographically," she writes, "then the world is indeed, as the Eastern religions have said, maya: a magic show. Its concreteness is an illusion" (1980, 180).
4. Heraclitus writes, "Things taken together are whole and not whole, something which is being brought together and brought apart, which is in tune and out of tune; out of all things there comes a unity, and out of a unity all things" (Kirk and Raven 1960, 191).
5. On one occasion, Bohm describes the holomovement as an interpenetration of matter and spirit, but on no occasion does he give ontological priority to spirit (Weber 1982b, 206-7).
6. On at least one occasion Bohm tiptoed so close to the edge of theology that he could not prevent himself from falling in. The reason he gave the people assembled at Saint James's Church in London for declining to apply the term *God* to the multidimensional ground has a mystical tone to it. He said that the voice which spoke to Moses in the burning bush referred to itself simply as "I am." Bohm believes the "I am" without predicates places it beyond all limits of time, space, and condition. It would be wrong to add predicates to the "I am" as Christians and other religious people do, he says, because

this would lead to religious belief and then to theology and then to interreligious fighting over competing theologies. Religious people who fight with one another contribute to the fragmentation which postmodernity seeks to supersede. Therefore Bohm himself wishes to avoid any predication by identifying Moses' "I am" with "a universal energy pervaded with intelligence and love, which is the ground of everything" (Bohm 1983b; cf. 1985a). But, one must ask immediately, what are "universal energy," "intelligence," "love," and "ground" if not predicates? Just how is Bohm's approach nontheological? In effect, Bohm has a god here, whether he admits it or not. This may mark somewhat of a departure from his position on nontheology (cf. Bohm 1985b).

REFERENCES

- Baumer, Franklin L. 1977. *Modern European Thought: Continuity and Change in Ideas 1600-1950*. New York: Macmillan.
- Bohm, David. 1980. *Wholeness and the Implicate Order*. London and Boston: Routledge & Kegan Paul.
- . 1985a. "Hidden Variables and the Implicate Order." *Zygon: Journal of Religion and Science* 20 (June):111-24.
- . 1985b. "Fragmentation and Wholeness in Religion and in Science." *Zygon: Journal of Religion and Science* 20 (June):125-33.
- Capra, Fritjof. 1977. *The Tao of Physics*. New York: Bantam.
- . 1982. *The Turning Point*. New York: Bantam.
- Cobb, John B., Jr. 1969. *God and the World*. Philadelphia: Westminster.
- Ferguson, Marilyn. 1980. *The Aquarian Conspiracy*. Los Angeles: J. B. Tarcher.
- Gilkey, Langdon. 1969. *Naming the Whirlwind*. Indianapolis, Ind.: Bobbs-Merrill.
- Hick, John. 1973. *Philosophy of Religion*. Englewood Cliffs, N.J.: Prentice-Hall.
- Kirk, G. S. and J. E. Raven. 1960. *The Presocratic Philosophers*. Cambridge: Univ. Press.
- Koestler, Arthur. 1978. *Janus*. New York: Random House.
- Niebuhr, H. Richard. 1943. *Radical Monotheism and Western Culture*. New York: Harper.
- Pannenberg, Wolfhart. 1970-71. *Basic Questions in Theology*. 2 vols. Philadelphia: Fortress.
- Toffler, Alvin. 1980. *The Third Wave*. New York: William Morrow.
- Voegelin, Eric. 1957. *The World of the Polis*. Baton Rouge: Louisiana State Univ.
- von Weizsacker, C. F. 1966. *The History of Nature*. Chicago: Univ. of Chicago.
- Weber, Renee. 1982a. "The Enfolding-Unfolding Universe: A Conversation with David Bohm." In *The Holographic Paradigm and Other Paradoxes*, ed. Ken Wilber, 44-104. Boulder, Colo.: Shambala.
- . 1982b. "The Physicist and the Mystic—Is a Dialogue Between Them Possible? A Conversation with David Bohm." In *The Holographic Paradigm and Other Paradoxes*, ed. Ken Wilber, 187-214. Boulder, Colo.: Shambala.
- Wilber, Ken. 1982. "Physics, Mysticism, and the New Holographic Paradigm: A Critical Appraisal." In *The Holographic Paradigm and Other Paradoxes*, ed. Ken Wilber, 157-86. Boulder, Colo.: Shambala.