ISSUES IN PHYSICS, PSYCHOLOGY AND METAPHYSICS: A CONVERSATION

David Bohm
London, England

John Welwood
San Francisco, California

Parallels between the findings of modern physics and new perspectives in psychology have been a frequent theme in the transpersonal literature. In this *Journal,* several articles have explored some of these parallels and their implications (Le-Shan, 1969; Capra, 1976; Anderson, 1977, Welwood *et al,* 1978; Welwood, 1979). The present conversation was an attempt to investigate these parallels and *to* consider problems that might result from relying on physics and the holographic model in particular for psychological theory.

introduction to theory of implicate and explicate orders

David Bohm is a theoretical physicist at the University of London who has made important contributions to the theory of quantum mechanics. In recent years others have found a relationship between some of his ideas and neuropsychology, consciousness research, and related applications. In Bohm's theory (1973), the term *implicate* refers to an order of undivided wholeness where many elements are holistically compressed or enfolded together. They are there implicitly but have not yet become apparent, defined or explicit as separate elements. Bohm asks us to imagine drops of ink stirred into a container of viscous liquid. In the liquid they lose their separate identity, and interpenetrate with the whole. If we then reverse the direction of the stirring, the ink drops would reappear as separate objects at sequential moments in time. Bohm uses this analogy to illustrate how an enfolded order may unfold as an *explicate* order of discrete separate elements. Elsewhere he has discussed the philosophical implications of his views (Bohm, 1978).

I have been particularly struck by how Bohm's view of an implicate order in physics echoes the finding of phenomenological psychology that specific thoughts, feelings, and perceptions of the world manifest and express underlying and holistic kinds of knowing (see Welwood, 1977, 1979). Beyond that I was curious about the relationship in Bohm's thought between the implicate order, where forms exist embryonically, and an even wider ground which appears to be quite empty of form altogether. This conversation took place at the Krishnamurti Foundation, Ojai, California, in April, 1979.-*J. W.*

John Welwood: I would like to explore with you a new direction in psychology which looks beyond studying the mechanics of mind and even beyond social interactions. It is concerned with the quality of mind which is beyond personality and ego. But to include this "big mind" in the study of psychology is contradictory to some extent, because it is not just a "psyche" we are talking about-it is the nature of reality. This focus implies a radical change in what psychology would be. I have been trying to explore what the basis would be for this kind of psychology. What would be its ground, its discipline, its method, its understanding of what things are all about? I'm not sure we can study this within the framework of psychology, but it seems worth a try because psychology is an important influence now-not only in terms of how people with psychological problems are treated and handled, but also in terms of how people see and live their own lives. It seems that the idea of implicate order which you have developed in physics is an analogy for a deeper order of mind. It is hard to find words for these deeper orders of mind. The term "big mind" lumps many things together, namely, everything that is beyond what we can talk about, but which we can still know, intuit, or realize in some way, if only in little glimpses. It is something like what you mean by "implicate order," but it also points to a fertile "emptiness," an open dimension that goes beyond any thought forms, either implicit or explicit.

psychology and the deeper order of mind

David Bohm: Well, that is what is implicit in the implicate order, which cannot be made explicit at all. The energy which moves between the explicate and implicate orders is still further inward. It is the force which brings about the unfolding of the implicate. You see, we have the explicate order and the implicate order, and the movement from one to the other-which is the holomovement,

Welwood: So in your framework the holomovement is the movement between the implicate and the explicate?

Bohm: Right The holomovement is more "inward" than the

two orders which are its extremes. And beyond all this is that emptiness and fullness which is entirely implicit, which cannot be uttered.

Welwood: Entirely implicit. You're making a distinction between the implicate order and something beyond it, which is entirely implicit.

Bohm: That's right. "Implicate" still means that something could be said about it. But the ultimate ground of being is entirely unutterable, entirely implicit.

entirely implicit ground of being

Welwood: Implicit in the sense that it's *there.*

Bohm: Yes, it's there, it's real, it's genuine, it's true. We are in *it,* but we cannot utter it. We can perhaps get the vaguest notion of it. If you take a very small bit of a hologram, though you get an extremely vague notion of the whole, you still get the whole image. We could say that the whole of our thought is a very little bit of a larger reality. Therefore, at most, it gives the vaguest possible notion of what is beyond it.just enough to say it's there, but not enough to say anything about it.

Welwood: Psychologically speaking, there is a conceptual level, or thinking process, and there is a level of bodily or intuitive sensing which is more like your notion of implicate order.

Bohm: But even that is still not the widest reality. Beyond all that-the right brain, the left brain, whatever you want to call it, beyond the emotions, the sensations-is this unutterable, which we can only get the vaguest sense of, just enough to say consistently that it's there. But to say this gives no notion of what **it** is.

an unutterable reality

We/wood: Would you agree that both our thought and our intuition are permeated by that unutterable? Even when we are confused?

Bohm: Yes, in some sense. We could say everything exists in that. But as we begin to say things about it, we are beginning to make a subtle implicate order out of it, rather than the unutterable, entirely implicit reality which it is.

We/wood: We have to say it's there but we can't talk about it.

Bohm: That's right. Even that thing which permeates our thought is not it. We can keep on extending the implicate and getting it more and more subtle, but that's still not it. I take the

view that the two end parts of the movement are abstractions from the movement, whether in space or **in** the holomovement. In the holomovement one end is the implicate, the other the explicate. The movement between is more fundamentaL So the holomovement is not an *interaction* between implicate and explicate orders; rather it is the ground of both.

Welwood: At what point does your theory start to detach from the scientific data of physics and become more philosophical?

Bohm: Well, it's hard to say. Every explanation has some philosophical aspect. You cannot possibly make a general explanation without some philosophical idea. You can then go on from there into consciousness and say the implicate order is also perhaps the order of consciousness. And maybe there is that which is beyond both consciousness and matter. In one of my papers (Bohm, 1978) I suggest that reality contains factors of a higher dimension. As an analogy, if you had a rectangular fish tank, and you took photographs from two sides, you could project the two pictures onto a screen side by side and see a correlation of those two, which however is not an interaction of independently existent elements because both are actually two-dimensional projections of a higher three-dimensional reality.

factors of a higher dimension

Quantum mechanics implies that, in a rather similar way, two three-dimensional particles are not independently existent elements, but rather, they are each a three-dimensional projection of a higher six-dimensional reality. With 12 particles, each is a three-dimensional projection of a *Sn* dimensional reality. We cannot picture this situation, but as I explain in my book (Bohm, In press), both experimentally and theoretically, quantum mechanics strongly indicates the need for this new view of the higher dimensional reality, which is the ground of our ordinary three-dimensional reality.

Likewise, we could also say that mind and matter may be projections of an ever higher dimensional reality, which is the ground of both, and so on. In the same way, each person is a factor of a higher dimensional reality which is the group or society.

Welwood: Do you see consciousness and matter as basically on the same level, just that one is a more subtle version of the other?

Bohm: Well it depends on what you mean by consciousness. Insofar as we talk of thought, feeling, desire, will-they're not

so different from matter, as we ordinarily experience it, although quite a bit more subtle.

We/wood: Those would be like content.

Bohm: Consciousness as content is one factor. But it may go beyond the content. That is, it's like saying the trees are a sort of ground, but they are also actual structures that have grown out of the earth, the air and the water. We can say that earth, air, water, and light are the ground of life, of living things. Living things are what life is, and at the same time life goes beyond them. So in consciousness there may be an awareness-attention-and something going beyond it-intelligence. But ultimately we could say there is a ground, which is the ground of matter on one side, and the depths of consciousness on the other ... the same ground but a higher dimension in the sense that it cannot be encompassed by either of those two sides.

We/wood: Insofar as the implicate order is a philosophical notion, it will be difficult to get scientists to fully accept it.

Bohm: They only accept the philosophical notions they're accustomed to, and they're so accustomed to them they call them non-philosophical.

We/wood: What particular data in physics particularly supports the idea of implicate order?

Bohm: It's primarily the difficulty of understanding the quantum mechanics in the explicate order which finally leads to saying one can't understand it-it's just a system of computations. But that does not satisfy most physicists. So they say, nevertheless, physics isn't just computations-it's talking about particles that are real, and so this creates contradiction and confusion. However, the implicate order opens the way to look at the reality of that without contradiction. That's one point. Secondly, it opens the way to looking at matter more broadly and solving problems which are not even clearly formulated in quantum mechanics, such as "What is the real nature of time in quantum mechanics'?" It helps us to understand the nonlocality of the Einstein-Rosen-Podolsky experiment. It also opens up a way of trying to explain space and time through a deeper order. Finally, it helps us to understand the puzzling wave-particle nature of matter in the quantum theory, and to treat this consistently in a mathematical way, without getting into the unacceptable infinite results that come out of current treatments. It may take a very long time to fully explore these

physics and the implicate order

issues, but the implicate order is a broader framework that has promise of being able to do things that cannot be done by the classical approach.

We/wood: You have mentioned a kind of thinking that is more consistent with the general nature of reality.

analytic and holistic thought

Bohm: Yes, holistic thought. Our present thought is highly analytic, fragmentary, and rigid. It gets in the way of understanding the actual nature of reality. The ultimate ground is unutterable, but in between there is a large range of'reality that might be discussed and needs a better kind of thought.

Welwood: Is it a different kind of thought, or is it just that the content of the thought is different?

Bohm: It is a different kind, in the sense that the present content produces rigid blocks. It tends to record very strongly, and actually deforms the structure of the brain in a permanent way.

Welwood: Literally?

Bohm: Literally. Any thought which is very repetitious, strong, full of powerful emotion, and a sense of absolute certainty, will record too strongly and will really leave "grooves" in the brain. And one will be stuck in those "grooves."

We/wood: So aligning thinking with the way things are would create a shift. an actual, literal shift in the brain itself.

Bohm: Yes. When experiments have been done with radioactive tracers to see what happens inside the brain, every idea, every feeling creates a radical redistribution of blood in the brain. If you kept on bringing blood into a certain pattern all the time, you would begin to grow more cells there, and less cells somewhere else. And also, with very strong thoughts, the synapses would get very fixed, and many other similar things might happen. Going on a long time, in this present structure, thought produces a certain brain structure which is rather set, though it's not impossible to change.

boundaries between psychology and physics

Welwood: What do you think about the boundaries between disciplines now, especially between physics and psychology? It seems that many people who are doing transpersonal psychology are extremely interested in physics.

Bohm: I think that psychology has always been affected by physics. Historically, psychology has used the paradigm of

classical physics. Our psychological ideas have that structural belief in separate egos, in interaction, and in these being constituted of several "layers" of consciousness.

Welwood: Do you think it might be appropriate for psychology to come up to date with modem physics'?

Bohm: Well it could perhaps look at physics. But I don't think we should just simply accept something because it's in physics. I do think that the implicate order fits the psyche much better than the old order. Actually, it would be appropriate for psychologists to develop their own basic notions of order to free them from the old ones.

Welwood: So it might be possible for psychology to actually use the notion of the implicate order, though we might not can it that. That has been done already in phenomenological psychology, which talks about how we experience pre-conceptually and then articulate from that. And the articulation also affects the pre-conceptual. That movement between the two is the movement of creating new meanings, new ideas, new expressions. Each articulation carries forward the whole implicate. There is a resonance between the two such that the articulation opens up or creates a light on what is implicit. So psychology can work with the implicate level pretty well, because we can know it in our experience phenomenologically. But then beyond that there is a level of "big mind" or "open mind" or "empty awareness." Do you think there's a way to include or acknowledge that in a discipline without having to try to analyze it, which would distort it?

psychology and levels of mind

Bohm: I think there are many levels. There is what we could call a universal mind, a consciousness of mankind, which is still in the implicate order. It is the deeper level of consciousness which involves the ultimate thoughts by which society is held together. There are all kinds of implicit assumptions about the world and the self, the general and the particular, and how the mind is to work, and so on. That is really the basis of body's psyche and contains many problems that lead to fear, violence, and sorrow. That is a general consciousness which generates the particular consciousness of each individual.

We/wood: You mean a universal human consciousness. Consciousness has many different levels-gradations or implicates, almost.

Bohm: Yes, that is right. The notion of implicate order allows us to go into more and more subtle levels without thinking of the Freudian mechanical analogy of layers. We can use the

analogy of depth- but then the depth of the ocean has to refer to the depth of inwardness, not just to a set of layers. (The very word "level" implies layers.) The metaphor used by Freud inevitably led one to think of such layers, whereas we have this depth of inwardness which cannot be located anywhere, and in which there is immediate contact of all the levels. So I think we can explore these directions in psychology, as well as in physics or in any field. We cannot change anythingjust by dealing with the manifestations. We have got to find the substance, the essence of it. We say we want to change society, but if all the things that are going on around us are only the manifestations of the ground of society, what is this ground itself? The world of society is primarily the outcome of this deep layer of consciousness. Only when that is touched will society change. When that is touched, you touch the whole consciousness of mankind.

We/wood: And that can only be touched through the individual.

insight into deeper aspects of consciousness

Bohm: It can be touched through his understanding. But it can also be touched in a group that understands. In general, it can only be touched by insight into the deeper, more inward aspects of consciousness, whether collectively or apart. I don't think one should restrict oneself to the individual; it is a question of insight in general. Insight is not primarily the development of a new idea, but rather, the perception ofthis implicate structure of those deformations of the brain which are the barrier. There is a level of insight so deep that it does not deal with thought or feeling, but directly touches the material of the brain, and changes it. In any new ideas of science, the major thing that has been done is that scientists have gotten *over* barriers, such as those of compartmentalization. Once they have gotten over them, they produce ideas that anyone could have produced had his mind been as free as theirs.

Welwood: So, it's almost as if'there was some shift that allowed them ....

Bohm: Some removal of a previously fixed structure, and that takes a high energy and great passion which is ordinarily not present. So any change in society requires insight into this structure. As long as that structure remains, nothing much will be changed.

Welwood: All the little changes and reforms we could make would not have much effect.

Bohm: They would be manifestations. But there is an insight

that directly touches the physical structure of the brain. If you touch a small wire to a single nerve in someone's hand and you connect the wire to a loudspeaker, so that when the nerve works it clicks, that person can then use that feedback. One can find out in a unspecifiable way how to make it click, and even to make it click a tune after a while. The point is that it's possible, even by the more inward levels of thought, to touch a single nerve, and actually physically activate that nerve. There might be an insight of high energy which can touch this deformation of the brain without removing the necessary information. Drugs, though, are too crude, in the sense that they might simply remove large areas of information, which would just confuse the issue.

Welwood: Psychedelic drugs seem to have an effect like that.

Bohm: They may remove some of the blocks, but they also remove some of the necessary information. They work sort of "broadside"; they haven't got intelligence.

We/wood: The difference between meditation and something like psychedelic drugs seems to be that the individual actually exercises his own intelligence directly, rather than being a passive recipient.

Bohm: Yes, and this intelligence might go so deep that it doesn't belong to any person. The point is, such intelligence can remove these blocks, whereas drugs are cruder-they simply remove some of them, but get rid of other things that are necessary.

questioning the analogy of the hologram

Welwood: What do you think of all this current interest in your ideas, and in holograms? Many people are very excited about them. It seems there may be an overextension of the analogy of the hologram, as though the hologram can explain everything.

Bohm: Yes, the word "hologram" is too limited. There's nothing static anywhere. To make a hologram, you must have something fixed to record it in, such as little particles of silver in a photographic plate. The hologram is just an arrangement of these particles. On the other hand, if the holomovement is fundamental, then all the manifest features that appear to us are just recurrent, stable, and separable forms, whose ground is the ultimately undefinable and unanalyzable holomovement (Bohm, In press).

Welwood: So it's just a sloppy use of language to say something like "the world is a hologram."

Bohm: Yes, there is ultimately no hologram because a hologram is static. We can say the world is holomovement, and beyond that is the unutterable, entirely implicit ground.

Welwood: That makes it much clearer. So, the hologram seems to be a metaphor or analogy or image that can communicate to people. They can see in a physical form how it is that an interference pattern can be explicated into a three-dimensional image. Its value is simply as a metaphor or an analogy.

reality is not static

Bohm: Yes. What the hologram leaves out is not only that reality is not ultimately static, but also the higher dimensional nature of reality, to which I have already referred.

Welwood: What about the idea that Pribram (1979) uses, "frequency domain"?

Bohm: That is an abstraction from the deeper properties. Even the frequency properties do not cover the whole thing. Even if you took frequency as a more fundamental idea, you would have to start by building a multidimensional structure of frequency. That is, each particle has its own frequency. This is really the point about quantum mechanics that is most important. Even if you took many waves instead of many particles, each wave would be a projection of a higher dimensional reality and could not correctly be regarded as being in three-dimensional space.

We/wood: Each particle has three dimensions, and there are *n* particles.

Bohm: Well, *n* eventually being infinite. Or else you can analyze space as waves, and then you have *3n* waves, *n* approaching infinity. Each wave is then the projection of the holomovement, which is too subtle to be put in three-dimensional space. The projection may manifest as a wave or as a particle; that is why you have the wave/particle duality.

the frozen and abstracted hologram

We/wood: So the hologram in a sense is a frozen....

Bohm: Yes, it is frozen and also abstracted from all this; it doesn't really do justice to the higher dimensional reality. Like any analogy, it is only partial, but it has its usefulness.

Welwood: Beyond that aspect, what do you think about the excitement and interest around the holographic idea? Do you think it has some value?

Bohm: It does, up to a point. As you say, you could overdo it,

because first of all, even for quantum mechanics, it is only a partial analogy. I think it would be best if people could realize that it doesn't cover all the important issues.

Welwood: The hologram. But the holomovement goes further?

Bohm: Yes. What I'm talking about should eventually cover quantum mechanics. It might be useful more broadly, but then **it** might have to go still further. The holomovement is infinitely subtle. I don't like the word "paradigm" because it is too static.

subtle
holomovement
static
paradigm

Welwood: Is there any kind of alternative language?

Bohm: You could call it "metaphysics," if you like, or a proposal concerning the nature of reality.

Welwood: The paradigm exists within that ... a frozen form of that.

Bohm: Yes. Metaphysics is continually moving, making new proposals concerning the nature of reality. "Beyond physics" is what it means. Every view has metaphysics. If you say the world is made of nothing but atomic building blocks, that is metaphysics. And it is not actually proved anyway.

Welwood: What would be the best way to influence communities of scientists and scholars in terms of getting them to realize their implicit metaphysics? They seem to be so resistant to looking at that.

Bohm: Well, 1 do not know if you could do **it** actually. I think you probably could only reach a certain number of them. If you could do some calculation which would predict something new, they would pay more attention to you. But I'm afraid they would turn that into another set of fixed ideas. They would just replace their present frozen metaphysics with some new, equally fixed metaphysics. I think it essential that we see this holomovement as a flowing movement without borders and without boundaries which does not get fixed. We could develop this higher dimensional reality and make it more plain- however, we lack a simple and clear analogy which brings that out, and the hologram is too one-sided.

Welwood: We need a dynamic analogy to express this kind of movement, even in psychology. The old models in psychology not only are too static but also seem irrelevant to many aspects of life. The challenge is how to bring this notion of a wider level of mind into psychology without freezing it or explaining it as a

need
fora
dynamic
analogy

purely psychological function, which may be similar to what you are dealing with in physics.

Bohm: Yes.

Welwood: The question is how to introduce the idea of an immense energy beyond form into scientific disciplines without making it into some fixed formula. I appreciate your talking with me.

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David Bohm, Birbeck College, Univ, of London, London, England
John Welwood, 308 Lawton Street, San Francisco, California 94122