

DIALOGUE ON SCIENCE, SOCIETY, AND THE GENERATIVE ORDER

by David Bohm and Sean Kelly

Abstract. This article is an edited transcription of two conversations at Birkbeck College, London, in February 1987. Its primary concern is a transdisciplinary consciousness that refuses to comply with the tendency toward reductionism and simplification. Some of the problems the dialogue explores are (1) the notion of order (with particular reference to Bohm's recent reflections on the concept of the generative order), (2) the limits of knowledge and the concept of the Absolute, (3) the nature of perceptive or intuitive reason, (4) the relation between matter and mind, and (5) the contemporary global crisis and the possibility of creative evolution.

Keywords: generative order; the Absolute; wholeness; attention; dialogue.

SEAN KELLY: One of the things I'd like to talk about is the notion of complexity and the possibility of a trans- or metadisciplinary discourse that might emerge through a dialogue between the various disciplines.

DAVID BOHM: Which disciplines?

SK: You, for instance, began with certain problems in physics, then proposed a way of looking at the facts in question—namely, through the notion of the implicate order—which, however, clearly pertains to a much wider range of problems than the purely physical. So, for you, the starting point was physics, but your reflections led you to a view which can encompass or allow for the communication between several disciplines. We see this, similarly, with Sheldrake in biology (with his concept of morphogenetic fields) or with Jung in psychology (his theory of archetypes). So it seems that, through

David Bohm is professor of theoretical physics, Birkbeck College, London, and the author of *Causality and Chance in Modern Physics*, *Wholeness and the Implicate Order*, and *Science, Order, Creativity* (with F. David Peat). Sean M. Kelly, who initiated this article and conducted the interview with Dr. Bohm, is Assistant Professor of Religious Studies at the University of Windsor, Windsor, Ontario, Canada N9B 3P4.

[*Zygon*, vol. 25, no. 4 (December 1990).]

© 1990 by the Joint Publication Board of *Zygon*. ISSN 0591-2385

certain creative thinkers, the various disciplines are complexified from within to the point where a model or paradigm is proposed which, in effect, constitutes a trans- or metadisciplinary point of view. My question, then, is how you see the concept of the implicate order—or, perhaps the concept of the generative order you've been working with more recently—as contributing to such a trans- or metadisciplinary point of view.

DB: Well, the notion of the generative order may indeed permit the coming together of many disciplines. Of course, any such attempt may turn out to be limited. But it's a proposal to be explored. Basically, we assume the idea that complexity has to be understood through some simple generative order. This idea is present in a certain way in the mathematical notion of the fractal, which shows how something complex can unfold from a generative order. This unfolding isn't determined wholly from the generative order, of course, but also by the constraints of that upon which the order works. In fact, the two are not separate, though we tend to make a distinction in thought. Take the example of a living being: We can assume, for the sake of argument, that DNA is the major source of the generative order (though it may involve much more than that) which works on the energy and material of the environment to produce a plant or animal where before there was just inanimate matter.

SK: Could you describe how the generative order differs from the implicate order, or how the two are related?

DB: One could say that the implicate order is a kind of generative order, in the sense that it generates the forms. In contrast with the fractal, however—which generates order locally by taking a particular region and dividing it up in some way to produce the same pattern or subpattern again and again—the implicate order produces a new pattern at each stage on the basis of the whole. Each region, of course, has its distinctive peculiarity. But in principle, at least, the whole comes into play, and not just the local connection. The implicate order generates a *wholly* new form each time.

SK: How would this relate to the microphysical realm? I'm thinking of the Schroedinger wave and the quantum potential, for instance.

DB: The implicate order describes how the Schroedinger wave operates. We could say that the Schroedinger wave transforms at the level of the implicate order. But the particle—which according to the

causal interpretation would be located at the level of the explicate order—is also affected by the implicate order, which acts as a kind of active information that guides its behavior. One view would be to focus on the implicate order as the primary reality, which gives rise to an explicate manifestation. But another view might see the implicate order as functioning within the explicate. The Schroedinger wave functions as active information implicit in the particle movement.

SK: How would the generative order fit in here?

DB: In this case the generative order is primarily in the wave function which determines the way the information is processed.

SK: Could we say that the generative order is a concept that allows for the articulation between the implicate and the explicate?

DB: Yes. It *does* allow that articulation in many ways. You see, the wave function is itself determined by a superwave function. And there's no reason why it should stop there. This allows for a generative order on many levels. The other view is to say that the wave function helps to generate an organization on a more explicate level. But something may organize the wave function, and so on. This would be close to the model of DNA, which is assumed to organize the movement of matter in the cell and the organism as a whole. But we might suppose something more subtle that works on the DNA.

SK: Such as Sheldrake's morphogenetic fields.

DB: Yes. And there may be a whole series of morphogenetic fields working on each other.

SK: So the generative order wouldn't be localizable at any particular level, but would consist in a movement that runs through these levels.

DB: A movement in which one level organizes or unfolds into another. If you think of the growth of an organism, you have several generative orders at work, and not just the DNA. Certain cells become organizing centers for other cells. If you look at the generative process of an embryo, you can see the appearance of organization at one level. But you may have to postulate other levels to understand this organization.

SK: This leads me to something else: You say, time and again, that as we explore the relation between the explicate and the implicate, or the manifest and the more subtle, we can grasp ever richer

meanings, but that this movement is in principle endless. We can never reach a form of absolute knowledge, as there is an infinite openness or limitless horizon to whatever order we chose to isolate.

DB: That's one way of putting it. Actually, if you look at the way we get knowledge, there doesn't seem to be any way it can cover everything, other than by imposing that assumption.

SK: I'm thinking here of the way you sometimes speak of the infinite, not as something *beyond* the finite, but as that which *includes* the finite in itself.

DB: But, you see, whatever you say the infinite *is*, it probably is not. What I have tried to suggest is that we will never capture reality in any set of words or concepts. It will always be a case of analogy, of a description that's sufficiently similar to actuality so that we will understand something. I don't know how you can tell that this is the end.

SK: But isn't the kind of knowledge you're advocating—a knowledge that recognizes its own ignorance—a knowledge of a significantly different order, an order which in effect constitutes a knowing of knowing?

DB: It's a superior kind of knowledge. I would certainly go that far. But whether it's absolute or not I don't know; somebody might come along with further refinements.

SK: But if we follow Hegel in his analysis of the concept of the Absolute, we see that it's incorrect to think of it as something "out there" or "beyond," since this would mean that it is conditioned by something else. The finite, in other words, has to be conceived of as a "moment" of the Absolute.

DB: That's one way of thinking of the Absolute. We can say that it includes the relative, and so on. But this remains a proposal. We have no way of knowing whether this is absolutely true or not. What is the criterion for defining what we mean by the word *Absolute*?

SK: In its concept, the Absolute is that to which nothing can be added.

DB: Yes. We can say that in words. But I don't know that it refers to anything.

SK: It doesn't refer to anything beyond itself. There's nothing beyond it.

DB: You can't say there's nothing beyond a concept, unless you want to believe the universe is a concept in the mind of God. You can't believe there's nothing beyond *our* concept. Right? Any human concept seems to be limited in some way.

SK: But isn't the concept of the Absolute precisely this insight—in the sense of a second-order reflection—into the nature of this limit?

DB: Yes. But there may be something wrong with or limited in this reflection. All I can say is that we haven't seen limits to this reflection.

SK: Doesn't it hold its own limit?

DB: What is its own limit?

SK: It limits itself.

DB: Yes. It has its internal limit in itself. But that doesn't prove that there's not also another limit of which we are presently unaware. If we were to postulate knowledge in the mind of God, as Hegel seems to, out of which Nature is created as a kind of thought, then you could make sense of this proposal. But you still have no way of proving it.

SK: But I see this same problematic coming up at certain points in your writings, when you talk about the Whole, for instance. The world as we normally perceive it doesn't pose this kind of problem. It can more or less be mapped out onto Cartesian grids, and so on. But when we penetrate more deeply, as in quantum mechanics, we come across certain seeming paradoxes which the mathematical formalisms, by themselves, cannot account for. In your own case, however, this stimulates insight into an order which subtends the explicate realm of our everyday experience. And when you asked yourself what was the relation between these two orders—that is, the implicate and the explicate—you characterized it as a movement of unbroken wholeness, which you call the holomovement.

DB: I'm saying that's a proposal. I can also ask: "What is the relation between the whole and the parts?" The dialectical principle of the wholeness of the whole and the parts must be complemented with the principle of the partiality of the parts and the whole. You may say the principle of wholeness is ultimately to be emphasized, but both sides must be kept in mind.

One of the principal difficulties in human thought is that the question of the whole and parts is confused. That is, people apply the notion of partiality where wholeness is required. For instance, they distinguish between nations in an absolute sense, whereas the

wholeness of humanity is required. At the same time, they're applying wholeness in the wrong place—as when they speak of the nation as a whole when it's really a mass of fragments. So the human mind has got caught up in a confusion as to how to set up wholes and parts correctly.

This tendency is very much tied up with the emotional side of the brain, in particular with the need for some sense of security. If a person becomes disturbed, the brain can produce endorphins—which is like naturally occurring morphine—to quiet the nerves. So if certain thoughts can liberate the endorphins, then the thought that you have a solid whole becomes very appealing. The removal of that thought removes the endorphins, and it's like somebody hooked on morphine who experiences withdrawal symptoms. In order to get the endorphins back, you hold the thought that produces them. In this way, thought goes wrong. It's being dominated by neurochemistry. And one of the things on which it goes wrong is just this question of parts and whole. Tremendous emotion is generated by the question of parts and whole. It's not just an intellectual question. The base of the brain can stir up certain emotions that prevent the cortex from working properly, which in turn goes on to produce images that the base of the brain can't resist—such as this wonderful wholeness of our country that we would gladly die for, etc.

What is required in the place of such a misguided sense of wholeness is a perception that, deep down in the generative order, the human race constitutes a whole. Though it has broken up because of confusion, even in its confusion it is manifesting itself as a whole.

SK: So the whole, in principle, maintains a priority over the parts, but only as a generative whole.

DB: At the level of the generative order, yes. At the level of the nongenerative order, we just have to get straight what is the whole and what are the parts. If we are confused about either it's just as bad. Overextension of wholeness at that level is just as bad as fragmentation. A great many tyrannies are based on an overextension of the concept of wholeness. Now, the more deeply we penetrate into the generative order, the more we tend to grasp things as wholes. Less deeply, we grasp them more as parts. Both have their place, obviously. Grasping things through the generative order is a question of what Hegel calls *Vernunft*, which he distinguishes from *Verstand*.

SK: You make an analogous distinction between intelligence and intellect, do you not?

DB: Yes. Intelligence, or *Vernunft*, is perception through the mind, in the sense of grasping the generative order. Intellect, or *Verstand*, doesn't go as deep and is confined to the principles of formal logic, and so on.

SK: In your recent book with David Peat you stress the importance of metaphor and analogy. From what you've said, however, you would seem to attach an equal importance to the need to *think* in a generative way.

DB: But I think metaphor is part of that. Metaphor is the generation of the analogy, and the means through which all the similarities and differences are unfolded.

SK: Hegel too recognized the richness of what he called the representational mode. In German, the verb "to represent," *vorstellen*, also means "to introduce." Religion, for instance, works with representations and can serve as the introduction to the concept of the Absolute. But as long as we stay at the level of representation, at the level of images and metaphors, we will inevitably get caught in opposing the Absolute to the relative or the infinite to the finite. For this reason, Hegel argues that we have to transcend the metaphorical mode and move to the level of what he calls the Concept, *der Begriff*.

DB: Both metaphor and concept, as I see it, proceed from the level of the generative order.

SK: How would you see this as affecting the theory of biological evolution? Hegel, for his part, rejected the idea of natural evolution, saying that the new forms don't arise in time but are generated by the Concept, which is, in a sense, "beyond" time.

DB: Science hasn't succeeded in explaining why there are any basically new forms at all. The notion of random variations doesn't explain such new forms. Thus, some biologists have said that the internal order of a thing is more significant than its external fitting. For example, the body and the mind both have a vast internal order. If you were to follow the connections of any cell in the brain, you would find that it's connected much more strongly to the rest of the brain than to the sense organs. This suggests that the internal order is somehow primary and that this responds to the order of the senses and whatever is outside. Without such an internal order it makes no sense to speak of adaptation. Such internal order, I would say, is a manifestation of the Concept. Certainly this is so in our own case. So if you were to generalize the notion of the Concept, you could say that it is a kind of deeper implicate or generative order capable

of infinite variation. But then the environment may choose which form will fit.

SK: So we could say that the forms, in some sense, are already there, prior to their emergence.

DB: One way of approaching this would be to say that there is an infinity of implicit forms which can only unfold under certain conditions. Most of them will get blocked in the generative process because they are in some way inconsistent, either with themselves or with the environment.

SK: In your recent book you say that, ultimately, it's the holomovement that generates the movement of enfoldment and unfoldment.

DB: The concept of the holomovement gives expression to the sense of the totality. After all, the function of these words is to create a certain state of mind. I feel that we grasp things through our mind and body going into some state which is analogous to that which we are trying to grasp. This is the intuitive understanding which underlies the formal understanding, although the dominant attitude today is to regard the formal as primary. The intuitive sense of the holomovement suggests something subtle, like the movement of a symphony. At the level of active information, which is the more fundamental level of reality, the movement can be described as a movement through a series of stages, from the implicate or subtle to the more explicate or manifest, as well as leaving room for the possibility of information coming the other way.

SK: If it's possible to have an intuition of this whole, and come up with a discourse that describes this intuition, however imperfectly, in terms of the holomovement and the generative order, then we have to do here with a form of knowledge. And yet you say time and again that the ground of the Whole is unknowable and indescribable.

DB: Well, we could say this is a kind of metaphor we're making. The function of a metaphor is to call attention to something where the similarity is not otherwise definable. A poetic metaphor usually creates a state of tension between two very different things. The poet doesn't like to have the state of tension explained. He feels that the state of tension itself is what is called for. But in science we unfold the meaning of this. We find the similarities and differences and try to state them explicitly. Take Newton's metaphorical perception that the moon is an apple, which he unfolded by asking, In what ways? And so on. The poet would just leave it at that, right? I think

metaphysics is ultimately poetry. It's not the kind of knowledge we're aiming for in hard science. On the other hand, it's not just clouds and vapor either. It has a definite function, and there can be both bad and good metaphysics. In this case we're trying to make poetry. If I say reality is the holomovement, just as we would have to admit the moon is *not* an apple, so too we would have to say that reality is *not* the holomovement, which is after all only a word. All that the holomovement means cannot be all that reality is. So what we're doing is making a metaphor and saying that in some implicit sense there's a fundamental similarity between reality and the meaning of this word *holomovement*. The point is that it remains implicit and so guides your attention and perception.

SK: Would you agree that when we leave the poetic or metaphoric mode, the only way to talk intelligibly about the whole is to contradict ourselves?

DB: Let's call it a formal contradiction. There must be a formal contradiction at the level of *Verstand*, whereas this constitutes the very coherence of *Vernunft* or perceptive reason. We can say, with Hegel, that the contradiction is *aufgehoben*, in the sense that what we say is a mere moment or shadowy form of what we mean. Contradiction in what we say needn't disturb us unless we remain in the mode of *Verstand*. The whole is flowing movement, whereas *Verstand* seeks that which "stands." If we say, with Heraclitus, that movement is what *is*—and this is the idea of the implicate order and the holomovement—then we can always form an abstraction of what stands, in which case movement will always enter in as contradiction.

SK: So, in the mode of perceptive reason, it *is* possible to describe and in some sense know the Whole, as long as we accept paradox and can live with the contradiction.

DB: We get a sense of the Whole, yes. We know the Whole in the sense of intuitively feeling the meaning of it. We could say that we are participating in the Whole in sensing this meaning. But of course this doesn't mean that the detailed analysis we make in terms of *Verstand* is going correctly to reflect the Whole.

SK: To return to the idea of complexity. In his recent book, *The Knowing of Knowing*, Morin proposes three essential elements, or principles of intelligibility, of complex thinking. The first is the hologrammatic principle—and it is here that he pays tribute to your work—as well as to that of Pribram and others. The second principle is that of the dialogic, which includes the notion of the dialectic but

in some sense goes beyond it. The dialogic refers to the coming together of two seemingly incompatible or contradictory logics, such as the autologic proper to the self-organization of the organism and the ecologic of the environment, both of which are necessary to a full comprehension of the complex auto-eco-organization of the living being. The third principle, which is the one I'd like to talk about, is that of recursivity. If we take the relation between the generative and the phenomenal in the living being, for instance, we see that the formative power of DNA is unintelligible without the phenomenal organization of the living individual, which in turn depends upon the formative power of the DNA. Or we could take the relation between the mind and the brain. Here Morin poses the question: What is the brain that is capable of producing a mind that conceives it? Along with the complementary question: What is the mind that is capable of conceiving the brain that produces it?

DB: Yes. But a further possibility is that, if there are other levels of infinite subtlety, then the mind may have its ground in something beyond any of this. The ground of mind may be beyond any particular structure that appears phenomenally.

SK: What do you mean by *mind* in this case?

DB: Let's take the model I've proposed of soma-significance. Any particular phenomenon can be seen as simultaneously mental and somatic. The electron, for instance, has a somatic side as a particle and a mental side as a wave of information. But this wave can in turn be taken as a more subtle form of matter. Then there's a yet subtler form of information that organizes it, and so on. We have mind and matter interpenetrating.

SK: So if we take Nature and Spirit as the universalized correlates of soma and significance, we can say, on one hand, that science shows the apparent emergence of Spirit out of physical organization but that, on the other hand, the very concept of physical organization is a product of Spirit.

DB: Not only that, because I'm proposing that physical organization has Spirit within it. What we call physical organization, on one side, is a kind of meaning or significance on the other.

SK: So you're saying that, prior to the emergence of self-consciousness, Spirit is already there as significance—in the form of active information.

DB: Yes. Spirit and matter/energy are present coeternally, you could say.

SK: What do you make, then, of the emergence of self-conscious Spirit in its specifically human form? Does this not represent a critical turning point, in that the prior state of soma-significance suddenly becomes capable of reflecting on itself?

DB: We don't know how sudden it is. There seems to be quite a bit of self-consciousness in the chimpanzee, for instance, and even in the dog or cat. It gets much greater with human beings, who have bigger brains and can use verbal symbols, and so on. Those who claim to have taught chimpanzees a language through the use of plastic symbols say that chimpanzees are perfectly capable of understanding the meaning of symbols that refer to themselves. When presented with a mirror, the chimpanzees don't behave all that differently from children of about two years of age.

SK: So if we can't focus on language as the distinctive factor in the emergence of human self-consciousness, what about the consciousness of death?

DB: That's another stage, obviously. It's not clear that animals have extensive consciousness of death. I think they know when it's approaching, but they can't symbolize it years ahead as we do. This creates a problem that the human being hasn't solved. What to make of this consciousness or symbolization [of that which we don't know at all? Religions have attempted] to provide some knowledge about this, but mainly on the basis of speculation.

SK: And perhaps some valid insights too.

DB: Perhaps some valid insights. You see, all of this is part of the development of consciousness, but that doesn't argue for any absolute dividing line or against the idea of a series of stages.

SK: You don't think there might be something analogous to the emergence of new biological forms in the sphere of consciousness?

DB: Maybe. But I don't see that we have any evidence for it. I don't know that Stone Age people had a basically different consciousness from our own. They had quite different cultures. But there's no evidence they would not understand us fairly well. When archaic tribes are exposed to our culture, most of them quickly want all the gadgets we've got, and so on. They get confused and lose motivation. But we see no sudden change in the basic form of consciousness.

If you go among archaic peoples you find the same problems: love, hate, fear.

SK: Maybe I can approach this problem from another angle. In your model of soma-significance you propose that meaning can be understood as the configuration of the whole which links both sides—the somatic and the significant. We see this at every level of organization, from the quantum mechanical to the biological to the sociocultural. But your own reflection on the meaning of meaning is of a qualitatively different nature, in that it constitutes a meta- or second-order reflection.

DB: Yes. I'm carrying it to another level. But that's been done in the past, of course. Well, we have to ask what the word *meaning* means. Or we could ask: What do we mean by the meaning of meaning? The word *meaning* by itself will point to some process. Now the question is whether this process is proprioceptive or not. To begin with, we can say it's a process of the body/mind. Now, many bodily processes are proprioceptive, in that you know you're doing them without having to work on it, remember it, or ask yourself whether you're doing it, and so on. There's no split between observer and observed. Now, having taken the word *meaning* by itself, and in this way pointing to the generative process, one possibility is that it is not proprioceptive and we need another meaning to look at it. The other possibility is that it *is* proprioceptive and we don't need another meaning to look at it.

SK: Because it refers to itself.

DB: It perceives itself, and not only abstractly refers to itself. It is aware and attentive to itself. And therefore it knows itself.

SK: So we can work out a way of speaking and thinking that looks at meaning proprioceptively. We can either use metaphor in describing it—and we even have to at certain points—or we can adopt dialogical and recursive types of discourse.

DB: There's the fact of attention as something which is not knowledge. Attention to that which is actually going on at the moment. At least, this is the kind of attention I'm talking about.

Now Hegel also talked a lot about attention to thought, which I think was a great perception. People have seldom seen that thought is something to which you can give attention. He was really treating thought as a process, saying you can learn about thought by giving it attention. Other people held that you can learn about thought by

thinking about it. You see the difference. He was giving attention to its actual sequence and process.

SK: And if we're attentive to thinking, would you go along with Hegel—even if you can't agree with his particular deductions—that the process of thinking, if we're attentive to it, ends up with the idea of the Whole?

DB: It moves toward the Whole, I think. You see, I make a distinction between thinking and thought. Thought is the past participle—what has been thought. What has been thought becomes mere reaction and disposition, a disposition to act and think without being conscious of it.

SK: Would you say that the scientific attitude of mind is, or ought to be, grounded in attention and perhaps also in a sense of wonder?

DB: Yes. It's grounded in that, but also in seeing the necessity of not falling into illusion, of testing for results and accepting them whether you like them or not. In other words, the scientific mind has to overcome the common tendency of letting like or dislike be the criterion of truth and falseness.

SK: The scientific mind is trained to operate at a high level of abstraction. Much, if not most, of its activity is confined to the manipulation of complex mathematical formalisms. Now that physics and the natural sciences generally have evolved to the point where the majority of people have very little understanding of what's going on, how important do you think it is for there to be an informal language accompanying the mathematical formalisms?

DB: I think it's very important. It's not only been neglected, but there's a positive belief that it shouldn't be bothered with, and that the formal approach is the only one that's important. It's partly because, having succeeded in a certain line, people believe it's the one to follow. Once you set a line and get a series of successes, people assume that this shows the unique truth of that line. But I think, first of all, it's very important psychologically that people should understand the world they're living in. To live in a world you can't assimilate produces what Marx called alienation. Or as the poet A. E. Houseman put it: "Alone and afraid in a world I never made." As far as most people are concerned, this world of science and technology is one they never made. They can't grasp it, and in some ways it's much more hostile than the natural world. Secondly, although this way of doing science may produce success in certain areas, it tends to narrow the mind to the point where it becomes blind to the

larger, generative whole in which it's operating. By concentrating on little bits it doesn't see the potentially destructive consequences of its own activity, such as the effects on the ecosystem.

I have always felt a revulsion or repugnance against the tendency to reduce science to techniques and sharply defined methods. This way of doing science only serves to create the illusion that people have everything under control and know exactly what to do, when in fact the confusion is increasing all the time.

The relevant point here is that because nature is infinitely rich, it's capable of fitting in with all kinds of assumptions. If you keep your vision narrow enough, it may seem we're making progress, as long, that is, as we overlook the general chaos in the outside area which this vision is producing. But we must ask ourselves whether, in the last twenty or thirty years, scientific progress has really benefited people more than it's harmed them. What we *do* see is vast destruction of the environment, the creation of cities that are unlivable, increasing crime, etc. We [even] see evidence that people are less happy than [their counterparts] were thirty years ago. Suppose physicists realize their dream of a theory of all the particles, capable of liberating great amounts of energy: What will they do with it? They will destroy vast areas, perhaps the whole Earth. A scientist like Freeman Dyson says he is sick of what's going on here on Earth, and so he wants to colonize the planets. But the same people, the same thoughts and assumptions, will go to these other planets, and they'll be just as ready to hate each other as they are here. In my day people used to say: "We've had it hard, but our children are going to have it better." I don't know many people who say that today. So where's the progress? What do people have to look forward to? Unemployment, AIDS, possibly nuclear war, ecological disaster, overpopulation, unlivable cities, etc.

SK: And increasing alienation from the mechanism that's producing all of this?

DB: Yes. Most people don't understand this mechanism at all. Physicists generally only understand the little bit they're working on. I think the whole direction has to change. It has to change in the generative order, and the generative order begins with one human being, then goes on to a few more, and so on. It's like the seed of an organism. If you think of the explicate order, it all looks pretty hopeless. It seems to have such momentum. But the explicate is grounded in the generative order. So, provided there's time, there is still a way out.

SK: In this connection, you attach great importance to dialogue and meditation.

DB: Outward and inward meditation, or meditation by the group and by the individual. They both have the same function, which is to free the mind from being attached to definite goals, aims, and purposes, with their rigid assumptions, so that it can explore new meanings freely.

SK: So we have to set time aside to “play.”

DB: That’s right. The mind cannot be healthy unless it does that, nor can society. If people could just *talk*. You see, there’s some evidence that Stone Age people, who lived in groups of twenty to forty, would get together in circles quite regularly and talk, tell stories, anything—without a set purpose or making a decision. People would talk and talk and make no decisions. But then they would know what to do. You see, dialogue creates a kind of common mind where people can trust each other—which is not what we have now. Once you fix a purpose, there’s always an assumption behind it that’s rigidly held, in which case the free play of the mind is limited. Now, at the present time, since we don’t have spontaneous dialogue, we could set up meetings whose sole purpose is for people to talk freely. We can admit that much purpose. If people agree to this there can be no further restrictions of content, since this would mean that some assumptions cannot be questioned. It’s hard to question certain assumptions, so it will take a sustained dialogue before people can come to trust each other. This kind of dialogue, where people are not trying to do anything in particular, is a collective meditation. The same thing happens in individual meditation. When the mind is allowed to go on its own, with no set aim, it can be deeply creative.

SK: So thinking we don’t have enough time, that we have to find a solution fast, might be one of the greatest dangers.

DB: Yes. If you say “I must find it fast,” then your ideas are fixed, and you will be accepting the assumptions that are creating the situation. We don’t know how fast it should be. In any case, I don’t know that we have any other choice. We may hope that it’s not as fast as it looks. I don’t think the greatest danger comes from the possibility of nuclear war. The ecological problem is more serious, and the problem of AIDS as well.

SK: All the indications seem to say that we’re at a critical turning point in history. This is evident on all levels—the ecological, the

biosocial, the political, the psychological. I can't help asking myself whether there is some implicit intention or goal at the level of the generative order, or whether it's wholly up to us to create this intention.

DB: There may be some kind of implicit intention at the level of the generative order. We can only speculate at this stage. In addition, however, we *do* have to participate creatively in forming this intention. The whole point of dialogue-meditation is to free the mind to form this intention. But this will never come about as long as people worry about immediate results. To many people, dialogue-meditation would seem like a waste of time because there's no obvious payoff.

SK: So what's required is a certain training in seeing through the explicate forms to the level of the generative order.

DB: It's primarily a matter of insight and attention. I mean a higher-order attention which is capable of scanning the contents of the brain as a whole. The special quality of this attention is that it changes that to which it attends in the very act of attending to it. In this sense it's not really like visual scanning but rather like the creation of an internal image as one explores an unseen object by manipulating it and touching it with the fingers. But even this metaphor is inadequate, because the attention goes much deeper than the particular senses, or even thought as a distinct process. In grasping the whole content of the brain this attention is directed to the generative order. Every particular function requires attention, but attention to the generative order is much more general than the attention involved in seeing, thinking, and so on.

SK: It's a kind of attention to attention.

DB: Yes. There's an implicit notion here of an attention to attention, in the sense that the process grasps itself as a whole, without dividing itself from itself. We can call this proprioception. The body has this. It knows that it has moved the hand without any special effort. The problem is that the mind is not generally proprioceptive. It produces emotions and all sorts of tensions in the body without perceiving that it is doing this. By giving attention to itself, the mind can become proprioceptive and can therefore perceive its own falseness or truth. By *false* I mean deceptive, whereas *true* means straight, honest, and faithful. In Latin, *veritas* means "that which is." If you put these meanings together, you could say truth is being straight, honest, and faithful to that which is. Thought may be correct, in the

sense of fairly accurately reflecting that which is, but still be untrue, in that its aim is ultimately deceptive, guided by selfish pleasure, and so on. Or thought may be momentarily incorrect but true because it is moving in the right direction.

SK: But how do we know it's true or moving in the right direction?

DB: I don't think we can know that. This is where attention comes in. We can give attention to the sense of falseness. We can sense this because false thought defends itself against the perception of falseness. That's its weakness. The ego defends itself. The thought of the nation defends itself. The thought of making money defends itself. People want to be flattered and then resist the evidence that they're being false. [It's very pervasive. Basically, as I said before,] it's a question of the brain's neurochemistry. When the brain gets disturbed it demands endorphins to stop the disturbance. And as certain thoughts give rise to the endorphins, the brain will demand false thoughts. This process probably has a place, beginning with the young child who, at least sometimes, needs comfort and protection, and for whom incorrect thoughts don't matter too much for the moment. In fact, if the child didn't have some of these, it would probably find the world too terrifying. As it grows up it becomes capable of straightening all this out. But as society has become committed to this infantile way of thinking, it doesn't do it. Nationalistic ideology and religious fanaticism are part of this infantile way of thinking.

SK: What about the role of nonfanatical religion in all of this? By "religion" here I mean primarily the sense of the sacred.

DB: I wouldn't say that's false. But its formalization, the definite assumptions people make about it, which they defend, are tied up with the endorphins. People get hooked on them, and then they're compelled to defend these assumptions to the death.

SK: "Turn or burn."

DB: Yes. People defend scientific ideas in a similar way, though not to such extremes. Religion didn't begin that way. And neither did science. But it's getting more rigid.

SK: You say at one point that insight itself constitutes a change in the actual state of affairs.

DB: Yes. The very attention involved in insight simultaneously conveys information to the intelligence and changes the brain, at the

very least to remove what is false, though it probably goes much further.

SK: Do you sometimes feel compelled to do more? If I can put it this way: Do you feel your response to your attentiveness is proportional to the magnitude of your insight?

DB: The way I see it, very few people are working on the question of how these things come about, the processes and mechanisms, and so on. Very few focus on the core of the problem, which proceeds *from the level of the generative order*. There are several dimensions to this order, all of which have to be addressed. First, there's that of the individual. Then there's the sociocultural level, which can be explored through dialogue. A third dimension might be the biological, and a fourth might be the cosmic or spiritual. We have to get straight on all four dimensions. For the present, however, I think dialogue is the most urgent. I don't know what can be done with the cosmic or spiritual as, generally speaking, the human mind doesn't seem quiet enough at present to enter into it. People can more readily explore the individual-psychological and the sociocultural dimensions. The major task is to create some new kind of mind which can spread, not only by writing but also by people in dialogue groups. There has to be attention, individually, to how these things are working, including the effect on the body of all of this.

SK: So, if I understand you rightly, you're saying that however much we might hope for and see the need for change at the social and political level, the best we can do is, on the individual level, to cultivate attention and then seek out those with whom one can dialogue. This in itself will constitute, as you put it, the seed of a new generative order.

DB: Yes. We haven't had the right generative order for such a long time. Once the principle of hierarchy and bureaucracy was established as the major factor in human relationships, the psyche was frozen with rage and fear. The very youngest child, for instance, is often exposed to terrible situations. Those who are badly frustrated in their childhood then take it out on their own children, and so it goes on from generation to generation.

The Stone Age culture had a lot of problems, but the situation got much worse psychologically once society got too big for the previous organization, which was then replaced with the principle of hierarchy and bureaucracy.

SK: This is the beginning of history, in effect.

DB: Yes. And it was the beginning of extreme violence—with people plundering, enslaving, and exploiting each other, the creation of vast armies, and so on. The aboriginal culture of Australia, by contrast, is some thirty thousand years old. It was quite stable until the Europeans came along. There were quarrels and people killed one another occasionally, but they did not organize wars. They had quite a rich culture, an interesting component of which they called “dream time.” They would go into this when they needed to live in the desert. It gave them a different and more sensitive perception—a change in consciousness, in effect, so they could go to live in the desert. We today are in need of a similar but much greater change in consciousness.

REFERENCES

- Bohm, David, and F. David Peat. 1987. *Science, Order, Creativity*. New York: Bantam New Age Books.
- Kelly, Sean M. 1990. “Hegel and Morin: The Science of Wisdom and the Wisdom of the New Science.” *The Owl of Minerva: The Biannual Journal of the Hegel Society of America*, 20, 51–67.