The following is from the book “The Search for Meaning” - “The New Spirit in Science and Philosophy”. Published by Crucible in 1989, it is a collection of essays from scientists across many disciplines and that all center around the ideas put forth by David Bohm. The collection was edited by Paavo Pylkkanen.

Meaning and Information
by
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In this book our specific aim is to explore the notion that meaning is a key factor of being, not only for human beings individually and socially, but perhaps also for nature and for the whole universe.

When we use the term 'meaning', this includes *significance, purpose, intention* and *value*. However, these are only points of departure into the exploration of the meaning of meaning. Evidently, we cannot hope to do this in a few sentences. Rather, it has to be unfolded as we go along. In any case, there can be no exhaustive treatment of the subject, because there is no limit to meaning. Here, we can usefully bring in Korzybski's statement that whatever we say anything is, it isn't. It may be similar to what we say, but it is also something more and something different. Reality is therefore inexhaustible, and so evidently is meaning. What is needed is thus a creative attitude to the whole, allowing for the constantly fresh perception of reality, which requires the unending creation of new meanings. This is especially significant, in the exploration of the meaning of meaning.

Meaning is inseparably connected with information. The Operative notion here is that information has to do with form. Literally 'to inform' means ‘to put form into' something. First Of all, information has to be held in some form, which is carried either in a material system (e.g. a printed page) or in some energy (,.g. a radio wave). We find that in general a pure form cannot exist by itself, but has to have its subsistence in some kind of material or energetic basis; and this is why information has to be carried on such a basis. Thus, even the information in our sense impressions and in our thought processes has been found to be carried by physical and chemical processes taking place in the nervous system and the brain.

What is essential for a form to constitute information is that it shall have a *meaning.* For example, words in a language that we cannot read have no meaning, and therefore convey no information to us. Gregory Bateson has said, 'information is a difference that makes a difference'. But to be more precise, we should put it this way: Information is a difference of *form* that makes a difference of *content*, i.e., meaning. (For example, a difference in the forms of letters on a printed page generally makes a difference in what they mean.)

Meaning is the activity of information

Just how is information related to meaning? To go into this question, it is useful to consider the notion of *active information.* As an example, let us take a radio wave, whose form carries information representing either sound or pictures. The radio wave itself has very little energy. The receiver, however, has a much greater energy (e.g. from the power source). The structure of the radio is such that the form carried by the radio wave is imposed on the much greater energy of the receiver. The form in the radio wave thus literally 'informs' the energy in the receiver, i.e. puts its form into this energy, and this form is eventually *transformed* (which means 'form carried across') into related forms of sound and light. In the radio wave, the form is initially inactive, but as the form enters into the electrical energy of the receiver, we may say, that the information becomes active. In general, this information is only potentially active in the radio wave, but it becomes actually active only when and where there is a receiver which can respond to it with its 'own energy.

A similar notion holds in a computer. The form is held in the silicon chips, which have very little energy, but this form enters into the much greater energy of the overall activities of the computer, and may even act outside the computer (e.g. in a ship or an airplane controlled by an automatic pilot guided by the information in radar waves).

In all these cases, we have been considering devices made by human beings, that respond actively to information. However, in modern molecular biology, it is assumed that the DNA molecule constitutes a code (i.e. a language), and that the RNA molecules 'read' this code, and are thus in effect 'informed' as to what kind of proteins they are to make. The form of the DNA molecule thus enters into the general energy and activity of the cell. At any given moment, most of the form is inactive, as only certain parts of it are being 'read' by the RNA, according to the stage of growth and the circumstances of the cell. Here, we have a case in which the notion of active information does not depend on anything constructed by human beings. This shows that the idea of active information is not restricted to a human context, and suggests that such information may apply quite generally.

It is clear, of course, that the notion of active information also applies directly to human experience. For example, when the form of a road sign is apprehended in the brain and nervous system, the form is immediately active as *meaning* (e.g. if the traffic sign says 'stop', the human being brings the car to a halt).

A still more striking example is that of a person who encounters a shadow on a dark night. If this person's previous experience is such as to suggest that there may be assailants in the neighborhood, the meaning of an assailant may be immediately attributed to this form. The result will be an extensive and powerful activity of mind and body, including the production of adrenaline, the tensing of the muscles, and an increase in the rate of the heart. But if, on closer inspection, this person sees further evidence indicating that it is only a shadow, all this activity stops, and the body and mind become quiet again. It is clear then that *any* form to which meaning can be attributed may constitute information. This is generally potentially active, and may become actually active in the mind and body of a human being under suitable conditions.

Such relationships of activity in mind and body have been called psychosomatic, where 'psyche' means 'mind' or 'soul' and 'soma' means 'the body'. This suggests two separate systems that interact. But the examples that we have been discussing indicate a relationship much closer than mere interaction of separate entities. Rather, what is suggested is that they are merely two sides or aspects of an overall process, separated in thought for convenience of analysis, but inseparably united in reality.

I would like to suggest then that the activity, virtual or actual, in the energy and in the soma *is* the meaning of the information, rather than to say that the information affects an entity called the mind which in turn operates somehow on the matter of the body. So the relationship between active information and its meaning is basically similar to that between form and content, which we know is a distinction without a real difference or separation between the elements distinguished.

To help focus attention on this kind of distinction, I shall suggest the term *soma-significant*, instead of psychosomatic. In doing this, I am generalizing the notion of soma to include all matter. Each manifestation of matter has form, and this form has meaning (at least potentially, if not actually). So we see quite generally that soma is significant. But in turn, this significance may give rise to further somatic activity (e.g. as with the shadow on a dark night). We shall call this activity *signa-somatic*. So we have the two inseparable movements of soma becoming significant and the significance becoming a somatic activity. This holds not only for human beings, but also for computers (e.g. computers can now 'recognize' forms and act in a way that differs according to differences of form). Similarly the RNA in the cell can respond to the form of the DNA, so that the 'soma' of the DNA becomes significant, and this acts signa-somatically to produce proteins that differ according to differences in the form of the DNA. So the actions of soma-significant and signa-somatic can thus be extended beyond the domain of human experience, and even beyond the domain of devices constructed by human beings.

It is important to consider the fact that the activity of meaning may be only virtual, rather than actual. Virtual activity is more than a mere potentiality. Rather, it is a kind of suspended action. For example, the meaning of a word or of any other form may act as imagination. Although there is no visible outward action, there is nevertheless still an action, which evidently involves the somatic activity of brain and nervous system, and may also involve the hormones and muscular tension, if the meaning has a strong emotional charge. However, at some stage, this action may cease to be suspended, so that an outward action results. For example, in reading a map the forms on the paper constitute information, and its meaning is

apprehended as a whole set of virtual activities (e.g. in the imagination), representing the actions that we might take in the territory represented by the map. But among these, only one will be actualized externally, according to where we find ourselves to be at the moment. The information on the map is thus potentially and virtually active in many ways, but actually and externally active at most in one way.

If, however, we can find no place, at least for the moment, to which the map is actually relevant, all such external activity may be suspended. As has indeed already been indicated, this sort of suspension of outward activity is nevertheless still a kind of inward activity that flows out of the total meaning of the available information, (which now includes the realization that there is no place to which the map is actually relevant). More generally then, all action (including what is called inaction) takes place at a given moment directly and immediately according to what the total situation means to us at the moment. That is to say, we do not first apprehend the meaning of the information and *then* choose to act or not act accordingly. Rather, the apprehension of meaning is, at the very same time, the totality of the action in question (even if this should include the action of suspending outward activity).

This inseparable relationship of meaning and action can be understood in more detail by considering that meaning indicates not only the *significance* of something, but also our *intention* toward it. Thus 'I mean to do something' signifies 'I intend to do it'. This double meaning of the word 'meaning' is not just an accident of our language, but rather, it contains an important insight into the overall structure of meaning.

To bring this out, we first note that an intention generally arises out of a previous perception of meaning or significance of a certain total situation. This gives all the relevant possibilities and implies reasons for choosing which of these is better. As a simple example, one may consider the various foods that one may eat. The actual choice may be made according to the significance of the food as something that one likes or dislikes, but it may depend further on the meaning of the knowledge that one has about the nutrient qualities of the food. More generally, such a choice, whether to act or not to act, will depend on the totality of significance at that moment. The source of all this activity includes not only perception and abstract or explicit knowledge, but also what Polanyi called *tacit knowledge*; i.e., knowledge containing concrete skills and reactions that are not specifiable in language (as for example is demonstrated in riding a bicycle). Ultimately, it is this whole Significance, including all sorts of potential and virtual actions, that gives rise to the overall intention, which we sense as a feeling of being ready to respond in a certain way.

It must be kept in mind, however, that most of the meaning in this process is *implicit*. Indeed, whatever we say or do, we cannot possibly describe in detail more than a very small part of the total significance that we may sense at any given moment. Moreover, when such significance gives rise to an intention, it too will be almost entirely implicit, at least in the beginning. For example, implicit in one's present intention to write or speak is a whole succession of words that one does not know in detail until one has actually spoken or written them. Moreover, in speaking or writing, these words are not chosen one by one. Rather, many words seem to be enfolded in any given momentary intention, and these emerge in a natural order, which is also enfolded.

Meaning and intention are thus seen to be inseparably related, as two sides or aspects of one activity. In actuality, they have no distinct existence, but for the sake of description we distinguish them (as we have done also with information and meaning). Meaning unfolds into intention, and intention into action, which, in turn, has further significance, so that there is, in general, a circular flow, or a cycle.

Closely related to meaning and intention is *value*. Thus, to say 'This means a great deal to me' signifies 'This has a very high value to me'. The word 'value' has the same root as *valor*; and it therefore suggests a kind of strength or virtue. Generally speaking, that which has for us a broad and deep significance will give rise to a sense of value, which arouses us to some kind of response, and infuses us with a corresponding strength or intensity of the kind of energy that is needed to carry out our intention. Without such a sense of value, we will have little interest and energy, and our action will tend to be weak and ineffective. It is thus clear that meanings implying some kind of high value will bring about strong and firm intentions. When such intentions are focused on a determinate end or aim (once again dependent on the overall meaning) they are called *will*. Thus, intention, value and will may be seen as key aspects of the soma-significant and signa-somatic cycle. It follows then that all three of these, together with meaning, flow and merge into each

other in an unbroken movement. The distinctions between them are only in thought. These distinctions are useful in trying to understand and talk about this process, but should not be taken to correspond to any real separation between them.

Thus far, we have been discussing how already-known meanings take part in the cycle described above. Generally speaking, such meanings implicitly contain a *disposition* to act in a corresponding way. Thus, if our view of a road suggests that it is level, our bodies will immediately be disposed to walk accordingly. Moreover, if there are unexpected pot-holes in the road, these may 'trip us up' until we see the meaning of the new situation, and thus immediately alter the disposition of our bodies. All meanings indeed imply (or enfold) various kinds of such *disposition to act* (or not to act), and these are an essential part of the signa-somatic activity of meaning.

As long as the action flowing out of a given set of such already-known meanings is coherent and appropriate, this sort of disposition will constantly be re-enforced, until it becomes a habit, or a *fixed disposition*.

But sooner or later, a situation will be encountered in which this disposition is no longer appropriate. It is then necessary to suspend the older dispositions, and to observe, to learn, and to perceive a new meaning, implying a new disposition.

As an example, consider a very young child, to whom bright objects have always signified goodness, happiness, pleasant excitement, etc., in which are implied a disposition to reach out and take hold of such objects. Suppose now that for the first time the child encounters a fire, and acts according to its habitual disposition. It will burn itself and withdraw its hand. The next time the child sees a fire, the initial disposition to reach out for it will be inhibited by the memory of the pain. When action is thus suspended, the mental energy in the intention to act will tend to go into the calling up of images of previous experiences with such objects. These will include not only images of many pleasing bright objects, but also the memory of the fire, which was pleasing when experienced far enough away but painful in the experience of contact. In a way, these images now constitute a new level of somatic form, resembling that of the original objects, but of a more subtle nature. This form is, as it were, 'scanned' or surveyed from a yet deeper and more subtle level of inward activity.

We emphasize again that in such a process, that which was previously the meaning (i.e. the images and their significance) is now being treated as a somatic form. The child can operate on this form, much as it can operate on the forms of ordinary Objects. Thus, the child is able to follow the image of the fire, as it gets closer and at a certain point it evokes a memory-based image of pain. Out of this emerges a new meaning, enabling the child to solve the problem of determining an appropriate relationship to the fire, without having to be in danger of burning itself again. In this new meaning, the fire is pleasant when the hand is far enough away and painful when it is too close. And a new disposition arises, which is to approach the fire more carefully and gradually, to find the 'best' distance from it. As the child engages in many similar learning experiences, there arises a still more subtle and more general disposition to learn in this way in approaching all sorts of objects. This makes for facility and skill in using the imagination in many different contexts to solve a wide range of problems of this general nature.

It is clear that this process can be carried to yet more subtle and more abstract levels of thought. In each stage, what was previously a relatively subtle meaning, can, as in the case of the fire, now be regarded as a relatively somatic form. The latter, in turn, can give rise to an intention to act on it. The energy of this intention is able then to give rise to an ever-changing sequence of images with yet more subtle meanings. This takes place in ways that are similar to those that took place with the image of the fire. Evidently, this process can go on indefinitely, to levels of ever greater subtlety. (The word 'subtle' is based on a root signifying 'finely woven', and its meaning is 'rarefied, highly refined, delicate, elusive, indefinable and intangible'.)

Each of these levels may then be seen from the mental or from the material side. From the mental side it is an information content with a certain sense of meaning as a subtle virtual activity. But from the material side it is an actual activity that operates to organize the less subtle levels, and the latter thus serve as the

'material' on which such an operation takes place. Thus, at each stage, the meaning is the link or bridge between the two sides.

It is being proposed then that a similar relationship holds even at indefinitely greater levels of subtlety. The suggestion is that this possibility of going beyond any specifiable level of subtlety is the essential feature on which *intelligence* is based. That is to say, the whole process is not intrinsically limited by any definable pattern of thought, but is in principle constantly open to fresh, creative and original perceptions of new meanings.

This way of looking at the subject contrasts strongly with the commonly-held notion, to which I have referred earlier, that matter and mind are considered to be separate substances. In the view that I have been proposing, the mental and the material are two sides of one overall process that are (like form and content) separated only in thought and not in actuality. So there is only one energy which is the basis of all reality. The form, as apprehended on the mental side, gives shape to the activity of this energy, which later acts on less subtle forms of process that constitute, for this activity, the material side. Each part thus plays both roles, i.e., the mental and the material, but in different contexts and connections. There is never any real division between mental and material sides, at any stage of the overall process.

This implies, in contrast to the usual view, that meaning is an inherent and essential part of our overall reality, and is not merely a purely abstract and ethereal quality having its existence only in the mind. Or to put it differently, in human life, quite generally, meaning *is* being. Thus, if one were to ask what sort of person a given individual is, one would have to include all his or her characteristic tendencies and dispositions to act, which, as we have seen, come out of what everything means to that person. Thus our meanings flow into our being, and because the somatic forms in this being are significant, such being flows back into meaning. Each thus comes to reflect the other. But ultimately, each *is* the other. For the activity to which information gives rise is our being, and this being is actuality and action that are thus 'informed'. So meaning and being are separated only in thought, but not in actuality. They are but two aspects of one overall reality.

It is clear that because there is no limit to the levels of subtlety of meaning that are possible, the being flowing out of meaning is in principle infinite and inexhaustible. One can see that this also follows: in another way by noting that all meaning is to some degree ambiguous, because each *content* depends On some *context*. But this latter in turn can become a content, which depends on a yet broader context (which may include many levels of subtlety), and so on indefinitely. So meanings are inherently incomplete, and subject to change, as they are incorporated in broader, deeper, and more subtle meanings, arising in new contexts.

It is possible to look at this whole process in terms of the implicate or enfolded order (which I have discussed elsewhere). That is to say, all these levels and contexts of meaning enfold each other, and may have a significant bearing on each other. Meaning is thus a constantly expanding structure, in which the potential significance of any part is always being actualized by inclusion in greater contexts. It can therefore never be complete or final. At the limits of what has, at any moment, been comprehended are always unclarities, unsatisfactory features, and failures of actions flowing out of intention to fit what happens. The yet deeper intention is to be aware of these discrepancies and to allow the whole structure to change if necessary. This will lead to a movement in which there is the constant unfoldment of still more comprehensive meanings.

But, of course, each new meaning thus perceived has some limited domain in which the actions flowing out of it may be expected to fit what actually happens (e.g. as in the case of the child to whom 'bright' meant 'goodness' and 'happiness'). Such limits may in principle be extended indefinitely through further perceptions of new meanings. However, no matter how far this process may go, there will still be limits of some kind, which will be indicated by the disharmonies between our intentions, as based on these meanings, and the actual consequences that flow out of these intentions. At any stage, the perception of new meanings may resolve these discrepancies and disharmonies, but there will continue to be limits, so that the resulting knowledge is still incomplete.

What is implied then is what we have indeed already indicated; meaning is capable of an indefinite extension to ever greater levels of subtlety as well as of comprehensiveness. This can actually take place, however, only when new meanings are being perceived freshly from moment to moment. Of course, such fresh perceptions may flow freely into the short term memory, which does not hold a fixed content. It therefore seems natural to include the short term memory as a natural extension of fresh perception. However, the long term memory is a kind of relatively fixed recording, tending to have a certain stable quality. Of course, even long term memories may fade, or otherwise alter, as their meanings are seen to change in actual experience. Nevertheless, when the long term memory operates as the major factor in consciousness, it is not able to transform its own structure in a fundamental way. It has indeed only a limited capacity to adapt to new situations (e.g. by forming combinations of known images, ideas, principles, etc.).

To go beyond these limits, a fresh perception of new meanings is needed. To create new meanings in this way requires at least a potentially infinite degree of inwardness and subtlety in our mental processes. Such mental processes of indefinitely deep inwardness and subtlety can, however, incorporate the content of memory along with the rest of perception into wholes, in which, for example, old long term memories may take on new meanings. Thus, though memory is essentially mechanical when it is the major factor operating, it is nevertheless able, in a secondary role, to participate significantly in creativity.

Physics and active information

Thus far, we have been focusing mainly on meaning insofar as this operates in a human being. We have seen, however, that the notion of active information can be extended beyond this, to apply to radio receivers, to computers, and to the activity of DNA in a cell. I would like now to go further and show that a similar notion may apply to all inanimate matter at the level of the most fundamental laws of physics that are known; those of the quantum theory.

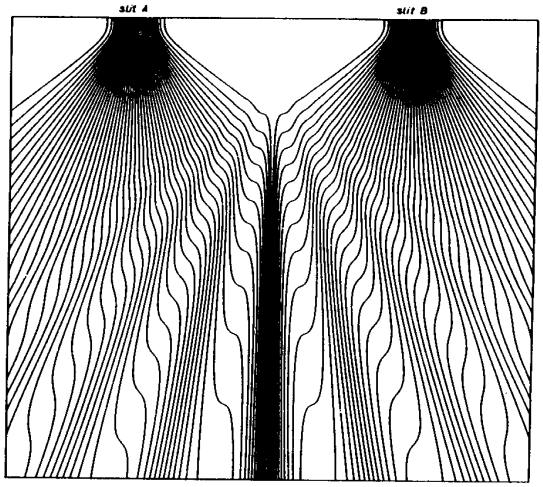
I shall begin by considering a single particle of matter; e.g. an electron. According to the quantum theory, such a particle shows wave-like properties, as well as particle-like properties. I propose to explain this by assuming that while the electron is a particle, it is always accompanied by a new kind of wave field, determined by Schrodinger's equation (rather as the Maxwell's equations determine the propagation of the electromagnetic field). The electron as we actually encounter it must then be understood in terms of both the particle *and* the field, which always accompanies the particle.

When one looks at the meaning of Schrodinger's equation expressed in terms of this model, one sees that it implies the need to add to the classical forces acting on the particle an additional new kind of force, derivable from what I called the quantum potential.

The basically new features of the quantum theory come mainly from the new properties of the quantum potential. Of these one of the most important is that this potential is related to the Schrodinger wave function in such a way that it does not depend on the intensity of the wave, but only on the form. This implies that the Schrodinger wave does not act like, for example, a water wave on a floating object to push the particle mechanically with a force proportional to its intensity. Rather, a better analogy would be one that we have already considered in connection with our discussion of information -- that of a ship or aeroplane on automatic pilot -- guided by radar waves. The ship or aeroplane (with its automatic Pilot) is a *self-active* system, i.e. it has its own energy. But the form of its activity is determined by the *information content* concerning its environment that is carried by the radar waves. This is independent of the intensity of the waves. We can similarly regard the quantum potential as containing *active information.* It is potentially active everywhere, but actually active only where and when there is a particle.

We may illustrate what this means by considering what happens to a statistical distribution of electrons that pass through a system of two slits and are detected on a screen, as illustrated below.

Each of these electrons follows a well-defined track that can be shown mathematically to be perpendicular to the wave front at the point where the particle is. Suppose then that we consider a specified particle which is so located that it goes through



Particle trajectories through two slits

one of the slits. Afterwards, it will follow a complicated path, so that the particle is significantly affected by a quantum potential determined by the interference of waves from both slits. It is clear that even though the electron goes through only one slit, its movement will depend on information coming from both slits. Indeed, even at distances so great that the wave intensity is small, there may be a significant effect of this kind, because, as has been pointed out, the electron responds with its own energy to the form of the wave, however weak the latter may be, and not to its intensity. As has already been pointed out, this response can strongly reflect distant features of the environment, and this implies a certain new quality of wholeness of the electron with the environment that is not present in classical physics. In this way, we understand that the path of each particle depends very much on whether one slit is open or both are open (which is contrary to what one would expect in classical physics). This is the proposed explanation of how the electron can behave in some ways like a particle and in other ways like a wave.

Thus, as we have seen, each individual particle follows a complicated path, depending strongly on the information in the form of the wave that reflects the whole environment. Nevertheless, it ultimately arrives at a particular point on the screen, thus demonstrating the particle nature of the electron. Yet, in a random statistical distribution of electrons with the same Schrodinger wave, we can see, as shown in Fig. 1, that all these particles 'bunch' to produce a fringe-like distribution on the screen. The field of information in the Schrodinger wave is thus reflected in the statistical distribution, and in this way we understand how the dependence of each particle in this field of information brings about the wave-like behavior of a statistical distribution of such particles.

This model implies however that an electron (for example) is not a simple billiard-ball-like entity, but that it may have an inner complexity comparable to that of a radio set or a vessel guided by an automatic pilot. However, to consider such a notion goes against the general approach in physics over the past few centuries, in which it is assumed that as we analyze matter into smaller and smaller units, its behavior will become simpler and simpler. Here, we are implying that in the quantum domain such an approach is no longer adequate. Rather, the situation is more like that which is encountered in a large population of human beings. Whereas in a large mass of people we can often make some relatively simple statistical analyses, nevertheless when we come down to the individual, we discover a complexity and subtlety that defies our powers of analysis.

Current theoretical notions suggest that an electron cannot be larger than something of the order of 10-'6 cm. Is it possible to have so much structure in such a small space? The application of the quantum theory to the gravitational theory suggests that our ordinary notions of space and time will hold down to a distance of the order of what is called the Planck length, which is about 10-33 Cm (beyond which all our present concepts of physics would probably break down). Between the electronic size of 10-'6 cm and the Planck length of 10-33 cm, there is a range of scales that is as great as that between every-day dimensions and the

presumed size of the electron. Thus, there is ample room for the possibility of the requisite structural complexity.

Thus far, we have been discussing only the one-particle system. When we consider the many-particle system, the significance of active information for the quantum theory becomes yet more evident.

Firstly, it must be said that in the many-particle system, the Schrodinger wave is no longer capable of being represented in the ordinary three-dimensional space. Rather, it has now to be thought of in a multi-dimensional space, called *configuration space*, in which there are three dimensions for each particle. A single point in this multi-dimensional space corresponds to a certain configuration of the entire system of particles -- hence the name, configuration space.

It is not possible directly to imagine such a configuration space. However, if we recall that the essential significance of the wave in the one-particle system was that it determines a kind of information, then the interpretation can readily be extended to the many-particle system. For it is well known that information, being a highly abstract sort of thing, can be organized and understood in any number of dimensions. This is a natural development of the idea that the Schrodinger wave is not to be regarded as a field of *force*, but rather as a field of information.

A more careful analysis of the mathematics for this case shows that the whole set of particles is now subject to a generalized sort of quantum potential. This depends on the Schrodinger field of the entire many-body system. So we have an extension of this interpretation to the many-body system, in which each particle is self-active. However, the form of its action may now depend on a common pool of information belonging to the whole system.

The activity of such a common pool of information in the mechanical context can be most clearly seen in the superconducting state of elections in a metal. This is a state that may arise at very low temperatures, in which an electric current flows indefinitely without friction, because electrons are not scattered by irregularities or obstacles in the metal in which they are flowing. In terms of this model, one sees that in the superconducting state, the common part of information induces an organized and coordinated movement of electrons resembling a ballet dance, in which the particles go around irregularities and obstacles without being scattered.

As the temperature is raised, however, the state of the system changes in such a way that the property of superconductivity disappears. The explanation for this is that the Schrodinger wave field begins to break up into independent factors, representing separate pools of information that apply to similar subsystems, and eventually, at high enough temperatures, to the individual particles themselves. It is as if, in the ballet, the dancers begin to break up into separate groups that are guided by different 'scores' , until eventually each individual is doing his or her own dance, unrelated to those of others. The coordinated state of movement therefore disappears, and the electrons behave more like a disorganized crowd of people than like an orderly group of ballet dancers.

More generally, one can show by an examination of the mathematics that the behavior of large-scale objects, especially at appreciable temperatures, will be determined by separate pools of information. This explains why, in ordinary large-scale experience, one finds no evidence of this new organized and coordinated quantum mechanical behavior. Rather, as can be shown, this latter will tend to become significant mainly in the small scale (i.e. with atoms and molecules). It can appear in the large scale, but only in special situations, which include low temperatures, or with other unusual experimental conditions that may be set up in the laboratory.

The possibility that many particles May move in the way described above according to a common pool of information, implies that there can be what is called *a non-local connection.* As in the one-particle case, this is because the quantum potential does not necessarily fall off to a negligible value when the particles are separated even by macroscopic orders of distance.

At first sight it seems that such a non-local connection, that can produce a kind of instantaneous contact of distant particles, would violate the theory of relativity, which requires that no signal can be transmitted faster than light. It is possible to show, however, that the quantum potential cannot be used to carry a signal, i.e. that it could not constitute a well ordered series of impulses that could transmit a well-defined *meaning*. But I shall not, however, go into more detail at this point as it is not directly relevant to the main theme of this paper.

The notion of such a non-local connection evidently goes quite far outside the framework of concepts that have been generally accepted in classical physics. But, of course, it is a perfectly rational idea. And indeed, I would say that much of the resistance that it has encountered is of the nature of the kind of prejudice that tends to arise against any unfamiliar notion.

We have seen then that in the quantum theory, the quantum potential may quite generally be regarded as representing active information, which may be organized in pools of sizes that vary according to the conditions. In accordance with the suggestion that meaning is the activity, virtual or actual, that flows out of such information, we are led to regard the movements of the self-active particles as the meaning of this information. This implies, however, that the notion of active information and meaning that has been proposed in more limited contexts (that include human beings, computers and DNA) can now be extended to the basic physical laws that apply to all matter.

The notion that meaning *is* being has in this way been extended to inanimate matter at the level of the most fundamental laws of physics that are known to us so far. Thus, if we were to ask what an electron is, we would have to include in the answer to this a description of how it behaves under various circumstances. According to classical physics, an electron is an entity that moves mechanically and is deflected only by external forces and pressures, that do not in general significantly reflect distant features of its environment. But according to the quantum theory, an electron is something that can significantly respond to information from distant features of its environment, and this mode of response, which is the meaning of the information, is essential to what the electron is.

In analogy to what has been said about human experiences, the particles constituting matter in general may be considered to represent a more gross (explicate) somatic level of activity, while the Schrodinger wave field corresponds to a finer, subtler, more implicate and 'mind-like' level. In human experience however, it has been proposed that each 'mind-like' level can be regarded as a somatic bearer of form when seen from a yet finer and more subtle level. This would imply firstly that the information represented by the Schrodinger wave field is being 'carried' by a finer and subtler level of matter that has not yet been revealed more directly. But even more important, it also implies that there may be a finer and more subtle level of information that guides the Schrodinger field, as the information on the Schrodinger field guides the particles. But this in turn is a yet more subtle 'somatic' form, which is acted on by a still more subtle kind of information, and so on. Such a hierarchy could in principle go on indefinitely. This means, of course, that the current quantum mechanical laws are only simplifications and abstractions from a vast totality, of which we are only 'scratching the surface'. That is to say, in physical experiments and observations carried out this far, deeper levels of this totality have not yet revealed themselves.

In this way, we arrive at a notion of matter in general which is closely parallel to what was proposed earlier with regard to the relationship of mind and matter in the human being. How then are these two hierarchies of active information, the material and the mental, related? Or are there actually two distinct and independently existent hierarchies?

It is being proposed here that there is in fact only one such hierarchy. In this, the more subtle levels, some of which we experience as thoughts, feelings, intention, will, etc., merge continuously with the less subtle levels. And therefore, what we experience as mind is ultimately connected, soma-significantly, and signa-somatically, to the Schrodinger wave field and to the particles. In this way, we can account for how matter at the ordinary level is knowable through what is called mind, and how the latter can affect what is called the soma of the body, and through this, matter more broadly. So we do not have a split between mind and matter in general. As with information and meaning they are two sides of one process, separable only in thought but not in actuality.

This implies of course that human consciousness is not something altogether outside the overall universe of matter. But matter has now come to signify a totality of being, ultimately of a subtlety beyond all definable limits. And thus, it may equally be called mind, or mind-matter, or matter-mind. In this one totality, meaning provides all being and, indeed, all existence.

Dialogue as a free flow of meaning

It is thus suggested that there may be cosmic meanings, beyond any human individual, or even the totality of humanity. But on the other side, human meanings affect not only the soma of the individual who holds them, but also that of other people to whom these meanings are communicated. And vice versa, the being of each individual is deeply affected by the meanings of society as a whole, as well as by those in nature and in the cosmos. Moreover, such meanings are communicated to inanimate matter, as human beings in their work profoundly affect their whole environment, which in turn profoundly affects them. The very essence of all being is thus in the flow of meaning, which is a generalized kind of communication. In this flow, everything enfolds everything and unfolds into everything. It is basically creative, and the appearance in it of relatively fixed forms is a kind of temporary crystallization of meaning, which can, however, melt' back again into the flow when the conditions change.

In society, the basic carrier of meaning is culture, which is indeed just shared meaning. (Thus art, literature, science, etc., which are commonly agreed to be parts of culture, conform to this notion.) It is crucial that the forms of culture (as well as those of social organization) shall not rigidify excessively, or else society will fall apart in fragmentation. We may compare this to what happens to a collection of electrons in a metal. They may move together through an organized and coherent common pool of information; or else they may break up into separate groups or even into individual particles, that move according to separate and independent pools of information. When human society as a whole breaks up into separate nations, religions, ideologies, and other groups, then there are many subcultures that largely ignore each other, and so the whole falls apart because there is no common pool of shared meaning· Eventually, this goes so far that, to a considerable extent, each individual seems to have a separate and independent pool of meaning, which may in turn fragment into many sub-pools. Such an individual feels lonely, even in the presence of others, for without a shared deeper more inward and more subtle meaning, people have only a rather superficial, crude mechanical relationship.

One of the most important reasons why such fragmentation is sustained is that each person, each group, etc., tends to hold rigidly to certain basic meanings, which are in effect nonnegotiable. Thus, when people in groups meet, the aim is either to convince the others of one's own position, or to persuade them to adopt it. Very often this leads to confrontation in which no real communication is possible, or at best to agreement, which again is rather superficial.

What is called for here is a genuine dialogue. The word dialogue is based on the Greek 'dia' meaning ‘through' and 'logos' meaning 'the word'. But what is signified here is not the word as such (i.e. the sound) but its *meaning.* Dialogue is a free flow of meaning between people. We may use here the image of a stream flowing between banks.

What is essential for dialogue is that while a person may prefer a certain position, he or she does not hold to it nonnegotiably. Such a person is ready to listen to others with sufficient sympathy and interest to understand the *meaning* of the other's position properly and is ready to change his or her own point of view if there is good reason to do so. Evidently, a spirit of goodwill or friendship is necessary for this to take place. It is not compatible with a spirit that is competitive, contentious, or aggressive.

If people are able to engage in a real dialogue, then there can be a free flow of meaning, in which there can arise a creatively new common pool, that allows the group to move together in a coherent and intelligent way. This will happen when people are able to face their disagreements without either confrontation or polite avoidance of the issue, and when they are willing to explore together points of view to which they may not personally subscribe. If they can in this way engage in a dialogue that is free of evasion or anger, they will find that no fixed position is so important that it is worth holding at the expense of blocking the

creativity of the dialogue itself. If this sort of thing could ever happen on a large scale, it would constitute a revolutionary transformation of the very nature of culture, and even of consciousness itself.

I hope that in the course of reading and discussing the ideas in *The Search For Meaning* we can not only explore the nature of dialogue as a free flow of meaning, but also, feel encouraged to engage in an actual dialogue of the kind that has been called for here. Thus, we may be able to see in actual fact whether the notion that meaning *is* being is relevant or not.

DISCUSSION

Is meaning being?

Maraca Wilkins: I wonder if you could clarify this statement you made that 'meaning is being'.

David Bohm: Remember what I said about the computer, the DNA, the electron, the pools of information that make the metal into the superconductor, that determine the properties of all matter. If you analyze what I said, you'll find that all these phenomena are produced when a significance *informs* energy. So according to this picture, matter is not a dead thing. It's not anything like billiard-balls pushing each other around. Rather, its structure and form is organized by an *active meaning*, meaning acting within energy. This notion is a kind of extension of our usual notion of meaning which applies in the human world.

Wilkins: I see the drift of your thought but I still find it confusing to say that soma is significance.

Bohm: The point is that *ultimately* there is no separation. In the beginning you can see that significance affects the energy and that affects the soma, right; we first separate them. But then, let's ask the next question: what is the soma? When we analyze the soma it sort of disappears. You see, here's a nice solid table, soma, but according to physicists, chemists and so on, it's made of particles which are moving around. It's mostly empty space but we say that the particles are the soma. But what are these particles? Ultimately you have to look at them with quantum mechanics and then you'll find that they're not at all like what we usually call particles. If you really try to understand what sort of particles they are, you'll find that they are particles that respond to *information*. The difference between an electron and a proton is largely the different way in which each responds to information in the wave-function.

Wilkins: Even if soma and significance aren't separate it doesn't follow they're the same. Can't you say that they are two aspects of the same basis, or that both being and meaning have the same essence?

Bohm: No, I think that puts the essence out somewhere else beyond both being and meaning. It is hard to see what this would signify I think it is better to say that the essence of being is meaning I have already explained this, both with regard to a human being, and, as I have just said, also with regard to inanimate things, including even the particles of physics, such as electrons. In all these cases, as the meaning changes so does the essence.

Wilkins: Going back to another point in your paper, you mentioned non-negotiable views and the harm these cause in human relationships. But some people might have got the impression that 'here is professor David Bohm, taking the fixed position that being is meaning and meaning is being' (laughter). I mean, I'm trying to understand this, I'm not just being awkward. Intuitively your position seems quite correct, for I can see a number of specific examples of human situations where this 'being is meaning' is appropriate. But would it possibly represent your position better if you would say that to see meaning and being as separate is an appropriate way of looking at things in certain situations, whereas to see meaning and being as one is appropriate in some other contexts?

Bohm: You could say that. I'd like to emphasize that none of the things that I say are meant as a completely exhaustive statement of reality.

Wilkins: So you're not really taking a fixed position although you might have appeared to...

Bohm: Let me put it differently: I'm making a proposal which is to be explored, and I want to put it fairly strongly to attract your attention (laughter). If I put it weakly you won't give your attention and it would be a waste of time.

Wilkins (jokingly): I don't think that's fair on the audience!

Bohm: No, I mean all of us like to put our proposals strongly.

Wilkins: I see your point. But I wonder about the need to see all being and meaning as one. It seems to me that in some of these examples you've referred to it is not clear where the idea of separating them is inferior to the idea of seeing them all as one. But there are other contexts where it clearly is desirable to see them as one -- for example, scientific knowledge, If you regard knowledge as separate from its application or implication, then there is no necessary connection between being a scientist who produces the knowledge and being responsible for the application.

Whereas if you regard scientific knowledge as one inseparable process which includes the way in which it is applied, then it is inescapable that the social responsibility for science must be part of the scientific process. This is a point which is very important in the world today. Another example which occurs to me is that I once read an account of a priest who had been asked to work in a prison and he was told: 'go into the cell with the prisoners and do what you can with them'. He realized that he could not very well go in there and talk -- he just went in and he said he just had to *be*.

Bohm: That was his meaning at that moment.

Wilkins: So there you have a practical, real human situation where being and meaning seem to be very much the same. But do you agree that the thing can be usefully split up sometimes and at other times you ought to see all as one?

Bohm: What you say is in a way implicit in what I said in my paper, for there are three stages in this matter. Firstly, meaning *becomes* being (and vice-versa). Through this process, meaning and being come to *reflect* each other. But ultimately, meaning is being. As with form and content, we make the distinction between meaning and being in order to express our thought. But this distinction does not imply a real difference, it is the way by which we understand one ultimately undivided whole. At the stage in which meaning and being reflect each other, they may be treated as separate. But in the deeper stage, meaning and being have to be seen as essentially one.

As you suggest, one could say that each of these stages is valid in its proper context. However, if we hold onto any one of them too rigidly, we will carry it too far. Thus, it *is* appropriate in a certain context to separate meaning and being. For example, I might say that this table has a certain meaning to me. To you or to a being from Mars, it may mean something else. So in this context we can separate meaning from being, for there are many meanings that are attributed to the chair, but the being of the chair is not directly affected by this.

But suppose we are discussing a particular person's notion or truth and trying to say that what truth means to that person is one thing and what he or she *is* is another. This would rarely be the case. Imagine, for example, a person to whom truth means that national interest comes first and that you can lie if that is necessary to protect the interest of the state, as Machiavelli said. Or take another person who might say 'no, truth comes first and national interest comes second'. These two meanings of truth give rise to two clearly different states of being, not separable from the whole being of the persons in question·

Wilkins: So are you saying that in thought you can regard the soma and significance as the aspects of one continuous reality but these differences only exist in thought, they are only separated in thought whereas in reality one is the other?

Bohm: Yes. That raises the question about what is the role of thought in trying to describe being. You could say that thought provides a kind of analogy to whatever is beyond thought. An analogy is literally a

proportion. You could say that as things are related in whatever you want to call reality, there is a similar relationship or a similar proportion in thought, a proportion not merely being number but proportion as quality. For example, A is to B, as C is to D. So we say that as certain things are related in thought they may be related in the thing. That is the essential quality of thought. But thought is not the thing. Whatever we say anything is, it isn't. It may be similar, but it is not it, it is more, it is different as well. Therefore, whatever reality is, it is inexhaustible. No matter how far we carry this analysis we say it is at most an analogy.

Don Factor: But what does it then mean when you use thought to say that meaning and being are the same thing. Is this still at a level of an analogy or is it something else?

Bohm: There are two points. One is to say 'meaning is being' considered as a formal thought. In this case we say it must provide some analogy. But then we must turn our attention from the ratio in the analogy to the ratio in the thing, whatever is meant by it. The thought will guide us to a correct *perception* if it is a good thought.

Alex Hankey: If one changed it from 'meaning is being' to 'being has meaning', would you object?

Bohm: I think it does not go far enough. If you say 'being has meaning' you could very well say 'it has meaning to me or perhaps to somebody else.' That would make it a fortuitous sort of affair -- it happens when somebody comes along that being has meaning. But I am trying to say that meaning pervades being, that it is being, both inanimate and animate. I want to propose going further.

Hankey: Meaning for being?

Bohm: Meaning for itself, even. I want to say that ultimately there is nobody to whom meaning is 'for'. Rather, meaning is the basic quality of reality. You see, if we ask 'for whom?' we might say 'it's for me' but I *am* my meanings. If things mean something different to me, I am a different person. If I were born in Nazi Germany, for example, the whole meaning would have been set up in such a way I could readily have said Hitler is wonderful. 'It's all very wonderful, such nice music and marching, it all means a great deal to me. Germany is great.' Then I would be a different person. So for whom is that Nazi meaning a meaning? That meaning is the Nazi. That meaning is part of the culture which goes into the person and makes that person.

Factor: If meaning is being in that full sense then where can a change of meaning come from?

Bohm: It can come because meaning is inexhaustible. There's no limit to meaning, you see. All meaning is ambiguous, it depends on the context; as the context changes, so does the meaning.

Frank Archer: Would you say that reality is a relationship between meanings?

Bohm: Well, reality is implicitly held within meanings, yes. Anything we know about reality must be according to what it means to us. Suppose that I say this chair is real. That means that if I push on the chair it will resist, it won't vanish. It will do various things which real things are supposed to do. It's not a figment; figments behave in another way.

Francis Steen: Would you call this the meaning the chair has for itself?

Bohm: No, you can't just say 'the chair itself', for what is it? I think we have to carry this onto the cosmic level, to say that the meaning is the whole. This is close to the Eastern view that matter and consciousness are inseparable, and that there is something you could call a proto-consciousness, proto-meaning or proto-intelligence behind matter. This implies that the mechanical picture of matter is limited, and if you look at quantum mechanics carefully, it is clear that the mechanistic view does not really work properly. Therefore, you are led to a view according to which there is a tremendous whole meaning· and there are sub-wholes of meaning, and so on. And due to these sub-systems of meaning we have relatively independent structures.

Rupert Sheldrake: So you are saying that meaning is being and that soma is also being. If we look at gravity in this way, your model seems to fit very well, because we can look at matter as the soma and the gravitational field as the significance or meaning· Then we have all kinds of particular sub-systems such as solar systems, with their particular meaning and soma-significance· Have you worked your model out in the context of gravitational fields?

Bohm: No, I haven't. I've concentrated on the quantum mechanical side.

Sheldrake: It seems to fit terribly well; I mean everything you've said about the electron and its associated field seems to apply to matter in general.

Bohm: You can look at it that way. The point is that in physics gravity *can* also be explained in a mechanical way, in terms of objects pushing each other through forces. Now, you may provide an alternative way of talking about it. But what is peculiar to quantum mechanics is that the old mechanical way is *not* adequate. That's why I've focused on quantum mechanics.

Sheldrake: Yes, but having arrived at the conclusion that the entire universe, being itself, is meaning, then your view must apply also to gravitation.

Bohm: It will apply to everything. But nevertheless, large scale objects, to a certain extent, have a considerable independence. They are largely following their own pools of information whereas we don't have as much independence at the quantum mechanical level.

Sheldrake: But they're not, though. I mean we know that the moon isn't just following its own pool of information, it's very much related to the sun and the earth, and the entire solar system seems to have just the kind of thing you talked about as a common pool of information.

Bohm: You can look at it that way, but then, it can be looked at the other way. This is an interesting point: physics can be looked at in two ways, either as if it were mechanical or as if it were teleological. The mechanical way, I think, is familiar to all of us; you think of all these planets moving, they are particular objects, moving with their inertia under the force; of gravity, pulling and pushing on each other, resulting in orbits -- that's mechanical.

Then, another approach was developed by people like Lagrange and Hamilton in the nineteenth century which was teleological, or at least looks that way. In this approach, the motion is no longer seen as mechanical. Instead, it is described by saying that each object moves over a whole period of time in such a way as to minimize a certain function called a Lagrangian. I don't know if you understand that, but you can think of an orbit over a whole period of time and you find that a certain function of this orbit which is rather abstract is minimized. So it looks as if the object is moving in such a way as if it were thinking: 'What shall I do, I'd better minimize my Lagrangian'.

You can look at it that way. It is common in science that there are often two quite different ways of looking at the same phenomenon, two meanings you can give to it. There's no unique meaning there and that's one of the creative features of meaning.

Sheldrake: If, as you seem to suggest, identity depends on meaning, then what about the identity of systems through time. I mean, if meaning is purpose or intention which is directed to the future, would you say that anything, be it a particle, a planet, a plant, an animal or a person, persists in time up to a point, because of this purpose? The meaning which has directed it through time gives rise to a continuation of the soma through time. Therefore the persistence in time actually depends on this purposiveness.

Bohm: Yes, I think that if you pursue this model which I was proposing further than we are able to at the moment, we would come to something like that. We now know that *nothing* persists forever; it is conceived that even the so called fundamental particles like protons are going to decay. Nothing known holds forever, and also if you go into a black hole or into the big bang, everything vanishes.

Therefore, you have to ask what sense it makes to think that some things *persist*. If you are to follow the view that I am proposing, you would say that the persistence of something is a kind of meaning. Its meaning is 'I must continue, I must reach the goal', whatever it might be. The simplest meaning is 'I must go on living' and the more complex meaning is 'I want to change in a certain way'. So you could ultimately say that the persistence of anything was due to a kind of meaning which meant 'keep on going'.

Sheldrake: Or in the case of inertia 'stay where you are'...

Bohm: ... 'keep on moving, keep on doing whatever you are doing'

Sheldrake: But this would provide a wonderful explanation of inertia· When these principles are applied to gravity or inertia, it seems that one could reframe classical physics and Einsteinian physics.

Bohm: That's an example of saying that the same phenomena can be understood in different meanings. You are quite right, that might be done. Suppose you say 'inertia' -- you see, that is merely a word covering your ignorance. For 'inertia' merely says that something keeps on doing whatever it is doing. It doesn't explain *why* it does so. You merely *assume* that it is doing so.

Science must always assume something, and then explain something else with it. So you can start by assuming inertia and explain a lot of other things. But then somebody comes along and says 'Why should there be inertia?' You can always question anything which has been assumed. For example, Newton made certain assumptions and they were accepted for hundreds of years and then Einstein questioned some of them, changed them. But he still accepted inertia. The picture he gave was to say that by first accepting the inertia of matter one could then explain through the curvature of space why there is gravitation. But then, this does not explain why matter has inertia.

But now you come along and say I would like to answer that question, I want to have a new meaning'. Then you might say 'maybe matter has inertia, because it has some form of information which is constantly informing it to keep on doing whatever it is doing'. That wouldn't be a final explanation, either, because some day somebody else would ask you 'why should it mean that?'

So the whole point of science is to begin with some assumptions and see if you can explain a wide range of things from a few assumptions. This enables you to *understand* in the sense that far more things are explained than you have assumed

Hankey: Your suggestion then is that matter is constantly being informed. But doesn't this mean that your model is not only causal but strictly deterministic.

Bohm: Well, it isn't necessarily. You see, this determinism is only relative in the sense that these systems are always open. If you were to take the one-particle system it would look deterministic, but then, as soon as it enters the many-particle system, it depends on a common pool of information. So whatever would determine it as one particle no longer determines it. And this many-particle system can become a part of a yet larger system which has its own pool, and so on. So finally you can say that there's no final determination but really some *relative* determination according to the context.

Steen: Could we consider again your model about the double slit experiment? In what sense can we think about this particle as a self-active system; you're perhaps suggesting it is not merely moving out of its own inertia, for instance. Bohm: Well, more deeply perhaps even this self-activity depends on a more subtle level of meaning; you see, meaning can never be complete.

Matti Bergstrom: Are there different sorts of beings, or is the being always the same, without structure?

Bohm: Well, meaning is part of the development of structure, but each structure is according to the meaning. You see, if you take the structure of a molecule according to quantum mechanics, it would depend on the pool of information that is in the wave-function of the whole system. So according to the pool of information you may have one structure or another. Quantum mechanics is now used to explain

chemistry as the best theory available. You can either say that it is just a system of calculations and then people use it only to work out the mathematics. Or else, you can try to interpret it, find the meaning.

Now if you propose the interpretation that I have suggested here, you can see that molecular structures are determined by this wave-function which I said is the pool of information. So you cannot understand chemistry, except on the basis of something like information and its meaning. Now this is not commonly known or accepted but I think it's quite a consistent suggestion.

Bergstrom: But what I asked was whether being has some internal structure or is being always the same being; you see, if meaning is being and there are many different sorts of meaning...

Bohm: ...then for every different meaning there is a different being, that's what I suggest. Again I want to say that in this area we are not going to come up with final answers; we will propose something and see if it leads to something fruitful which will help to understand. Otherwise we'll drop that meaning and consider another one.

One of the reasons for carrying physics this far is that there are many different meanings that can be given to the same phenomenon, and this requires a creative approach that looks at all of them. In a way you have a dialogue between them, and this may lead on to yet another meaning. The meaning is not fixed, we are not going to end up with a fixed picture of the universe out of this. I hope we are constantly understanding the thing more and more deeply; it is almost like a work of art. You see, meanings of a work of art for the artist are continually different.

When you interpret a physical theory, you are getting the meaning. And physical theories, as I have explained, can often be given a number of meanings. People may prefer one or the other, and they begin to think that's the only one. But as we extend this chosen view we always find that at the edges things are a bit unclear -- we interpret these unclarities and try to clarify them. But even this will carry on to a bigger context which eventually will have its unclear edges.

So you're not going to get a final meaning: the very structure of meaning is such that you cannot reach final meanings.

Culture, creativity and dialogue

Hankey: I'd like to consider your suggestion that meaning is being, in relation to the approach of the Eastern culture, and that of Vedic science in particular. There's a difference there, for while you see consciousness as a dynamic structure, the East emphasizes a more static structure.

But your view is similar to the Eastern notion that meaning is connected to correlations. For instance, in a dictionary, meaning is a correlation of words. Consciousness is something which is intrinsically correlated with itself, it has self-knowledge. It follows that if meaning is connected to correlation, and consciousness has self-correlation, then consciousness becomes something with *intrinsic* meaning. Now, in Vedic philosophy being is intrinsically consciousness and so one sees that meaning is being.

Bohm: There are two approaches, but they haven't as yet been gone into here. The fixedness of the Eastern approach may be due to its emphasis on the fullness or completeness of being which results in the suspension of outward action. The West emphasizes the incompleteness of being as something dynamic and transforming, which makes action seem important. Now, I feel that we have to get beyond these two into some creative domain *in between* which is neither one nor the other.

Each culture has its value. There is obviously a high value to what the East is doing and the value of the West was that it produced the tremendous power of science and technology. On the other hand, this power is very dangerous and destructive, and the oriental sense of stillness carried too far was also dangerous .

The important point is that neither approach has actually produced a civilization that is adequate. The East has not only decayed from its original creative state but is now mainly adopting Western science,

technology and so on. The West is falling apart in its own way. Each of these cultures has gone to an extreme -- perhaps they were originally very similar but then slowly drifted apart. Cultures are meaning, the East has one kind of meaning and the West another. It is the meaning of the West that makes it the West and the meaning of the East that makes it the East. I think that the difficult questions related to these cultural meanings would have to be worked out in a *dialogue*. A dialogue between these cultures would bring us to something new.

The power of meaning is that it completely organizes being. Very subtle cultural meanings have tremendous power over being. Therefore, it requires extreme clarity at these subtle levels and that is where civilizations seem to have primarily gone wrong, in not having that clarity. Maybe a few people had it in the beginning but those who followed began to lose it.

Hankey: But the East doesn't just emphasize fixedness. It emphasizes action and inaction, and inaction and action, which means dynamical fitting into the pattern of all things.

Bohm: That's true, but nevertheless, what has actually happened is that the static thing has become emphasized. You see, nobody has solved the problem of how to prevent the degeneration of the original vision.

Hankey: But the original vision *is* renewing.

Bohm: It is originally new, but nobody has solved the problem of how the vision can be constantly renewed. It becomes more static, more of a habit. The thing becomes, as I was saying, a *disposition* which gradually gets fixed. It gets transmitted from one generation to the other as a disposition, and the people who pick it up don't understand it in the same way as the people who had it, because they are merely imitating the disposition and not understanding the meaning from which it came. They may understand part of it, but not as well as those that came before. Each time it gets a little weaker.

It's this repetition through generations which reinforces the habit to go along with the old ways of thinking and all the old social relationships and the old culture. Especially now, this problem has to be solved if the civilizations are to survive. In the old days you could say 'well, a civilization could die and another one start up' but now with modern technology we may destroy the whole thing. The problem has become far more urgent.

Therefore the key question is: is it possible to have a constantly creative culture? As soon as you set up a culture its meanings become repetitive and they begin to pet in the way. Nevertheless, we need a culture.

Questioner: power gets in the way, too, with the defined power structures. The people in power may not be the creative ones.

Bohm: You see, we automatically assume that anybody must seek power. But if you ask yourself why should anyone want to seek power, and think about it, you can see that very few have achieved happiness through power, while many people have achieved a lot of unhappiness. But what has happened is that the culture has slowly got into the habit of giving great value to power. That is why power excites people and gives them energy and they begin to seek it.

The meaning of power then seems to be tremendously significant. Thinking of having a great power, a godlike power, gives an expanded feeling. The adrenaline flows, the heart beats, everything starts moving, a person finds all his energy directed towards getting power. So he or she becomes like Napoleon or Caesar or somebody. But you can ask why should a person who obviously had great abilities, such as Julius Caesar, have got caught in that trap? It ended up in his assassination. After all, it did not do him any good.

Power is a very subtle meaning which the society has slowly developed. If you build up a great structure of a state and a person looks at this big structure and thinks he is going to be in control of it, it starts exciting him, it has a great value. But it's an illusion.

What actually has value would be to have a constantly creative culture. Now I suggest that such creativity is related to a constant discovery of new meanings. Generally speaking we start from old meanings and commonly make small changes in them. Sometimes we may, however, perceive a big change of meaning. An idea changes in a fundamental way although, of course, some old features are still carried along, no matter how big the change is.

George Wikman: But what is it that really happens when you perceive a new meaning?

Bohm: That's the creative step. If I say that meaning is being and something new is perceived in a meaning, something has changed in being. For example, all the perceptions that took place in science changed the meaning of the world for us and this changed the world. It first changed in the sense that we saw it differently; but science also changed the physical, the somatic level. The entire earth has been changed and it could have changed a lot more, for the better or for the worse. Therefore, at least in my own experience, being and meaning are there together.

And I'm proposing this more generally. So if somebody sees a different meaning to society or to life, that will change society. Every revolution has come from somebody seeing a different meaning in human society. For example, the meaning that some people saw was that of a very static society, where everybody was in his place and the top was overlooking the bottom. Then other people saw a different meaning, according to which people should be equal. That different meaning was the power that generated the change. Then, if people become disappointed, that meaning loses its value and it falls apart. So as long as the basic meaning holds, society will be powerful and healthy, and when that meaning decays society will no longer work.

Paavo Pylkkanen: Earlier you mentioned that it is in trying to convey meanings to new generations that meanings decay. But what would your proposal 'meaning is being' imply to the educational process itself? At least it suggests that a student would *become* all the meanings being presented to her or him, and if these meanings are fixed, the students will end up rigid. On the other hand, if education involved new, creative meanings, the students would become creative because of the very presence of such meanings. Isn't it so that if meaning is being, you wouldn't need to apply meanings, but the effect would be more spontaneous?

Bohm: Yes, I think that if somebody perceives a new meaning he doesn't first perceive a meaning and then try to bring it about but rather, he has *already* changed. You see, it profoundly affects him. Now even in science you can see this. There's the example of Archimedes who, when getting down to his bath, realized that the volume of the water displaced by an object was independent of the shape of the object. It moved him so profoundly that he shouted 'Eureka!', got out of the bath and ran out -- at least he is believed to have done so. The point is that people will behave that way when they see a new meaning.

It is thus meaning which gives value -- the perception of a new meaning will move people profoundly. People saw the meaning of equality of humanity and of democracy, and that produced tremendous revolutions. Then people saw the meaning of socialism, and it produced worldwide upheavals. Relatively soon people lost those meanings and the society became corrupt -- or perhaps as society became corrupt people lost their meanings.

But the power behind all these movements is the meaning. It is not that first somebody sees the meaning and then decides to apply it, but rather, at the *moment* he sees the meaning he becomes that power.

Pylkkanen: But then, you could say that when you lose creativity then you don't have the power any more.

Bohm: Yes, when you lose creativity that ceases to happen.

John Briggs: Are you equating creativity with meaning?

Bohm: Well, to a creation of new meaning, a fresh constant perception of meaning.

Briggs: So when you talk about losing meaning, obviously you can't lose meaning because there are other meanings...

Bohm: You can lose the creativity of meaning, and fall back into rigidly fixed mechanical meanings.

Briggs: Could you say something along this line about the comment at the end of your paper, in which you discussed dialogue and meaning. It seems that one direction that you're taking is to suggest a change in our meaning and culture, a change in the way we behave -- obviously we need a big one in order to survive. What's the relationship of dialogue to that?

Bohm: The ordinary relationship of people is that each one holds his or her own views: certain fundamental views are not negotiable and not changeable. For example, take the so-called: negotiations that are going on between the East and the West in Geneva -- actually most of the basic positions are nonnegotiable and only trivial changes are possible. As long as they do it that way it can go on for a million years and nothing will happen.

Therefore, if people hold non-negotiable positions that is a sure formula for destruction, because each one will simply go on until they fight. As von Clausewitz said, war is the continuation of politics by other means. If politics is non-negotiable, then we try to settle it by war. But because of nuclear weapons war is not a feasible way of doing that any more. You cannot possibly use it to solve a crisis.

That difficulty in Geneva is only a magnification of the difficulty which exists in every human relationship from the top to the bottom. In every one of them there is the center which is non-negotiable. In the individual the center is the self, and it can be the group, the family, the nation, the ideology, the religion or the urge to make money. In all these cases we have a center that makes us think 'that's not negotiable, whatever happens I'll defend that'.

The point is whether it is possible for people really to talk. If you now look around and see how people talk in different situations, you'll see that they are holding non-negotiable positions. Occasionally they get into a confrontation and fight, but what usually happens is that they have simply learned skillfully to avoid touching such positions. Therefore the talk is superficial. People are not satisfied with not being able to get anywhere. But if the talk ceased to be superficial we would face the explosions which would come from these nonnegotiable positions. So is there any way out of that? I'm suggesting that if it were possible to listen to other positions, this would be a different state of mind. The usual state of mind is not capable of listening seriously to a position that is in contradiction to one's own.

Briggs: Is that because it presumes that its meaning is absolute?

Bohm: Yes, it says: 'this is absolutely necessary'. That is what is really behind it. This is a disposition. The word necessary comes from 'ne cesse' meaning 'do not yield'. So when something is absolutely necessary the disposition is 'I must never yield.- you get a hard, rigid disposition· It resists everything, it says: 'when you touch that point I will not yield'. But here all sorts of people having such different points; they all depend on each other and yet they cannot yield.

Briggs: So instead of holding onto our meanings in an unyielding way we could realize that all meanings we have are limited. This is so, because there is always the possibility of moving into a larger context than the present one. In a wider context our meanings might change.

Bohm: Yes, everything is in a larger context. Suppose that I see another position which I detest -- that's generally the feeling. Usually I won't listen to it or else I'11 fight, or keep away from it. But suppose that I can hold several such positions and say 'ok, I will listen to it, I'11 understand what it means'. Usually we don't get that far, we do not see what the other position means, we are rejecting it without even seeing what it means, which has no point. Now if your mind is able to hold a number of positions without rejecting their meanings, then I think it moves into another state from the common state and begins to move more freely without that rigidity.

Briggs: For one thing, you'd be in a larger context automatically.

Bohm: Yes, you're moving away from that rigidity which is preventing creativity. You see, creativity requires a free play of thought to move in any direction which creation calls for. If the mind is rigid it cannot be creative. So any fixed position means the end of creativity.

Briggs: It seems very difficult for anyone to grasp in a somatic way how we tend to hold our meanings absolutely. First of all, we don't attend to that feeling of holding them absolutely, and we don't attend to the difference between how that feels and how it feels when an insight occurs. There are neurophysiological differences between holding onto the old meanings, and finding new meanings.

Bohm: That's quite right. We've had quite a few dialogues with some groups in England, in Israel and in Geneva. Something happened in Israel which was particularly interesting. We were talking about various things, and as part of the flow of dialogue somebody got up and started talking about how irrelevant Zionism was, asking what was the point of it. Suddenly somebody got up explosively and said: ‘No, we need it, if we didn't have Zionism, we would go to pieces'.

It developed into something of a tremendous emotional charge, the kind that is very hard to defuse. Whenever anything fundamental like that is questioned, a tremendous emotional charge develops. You may ask, why isn't it there before. In fact it is, but you don't realize how important it is to you; it only comes out at that moment. The dialogue is both public and individual, the feelings of each person are experienced by all who are participating, more and less. You can then see the indissoluble connection between the intellectual idea and the feeling.

You see, Zionism is a purely intellectual idea, it has a certain structure, somebody invented it once -- there was a time when it did not exist. Somebody thought of it, and it took hold and great value was attached to it. It was thought to be the solution to all sorts of problems. There had been terrible suffering in Europe and they thought that maybe in Israel they could make a new society. It then built up into a tremendous emotional charge, so that any time it is questioned there's no yielding.

There's a similar emotional charge about capitalism and communism or almost any of the questions that are important. People generally are careful, they see this emotional reaction coming up beforehand and avoid it.

Questioner: We have to bring in the notion of identity when discussing the emotional charge, for it is the extent to which people have identified themselves with these meanings that creates the emotional charge when that meaning is questioned.

Bohm: Yes, but identification is in itself another meaning. Identity means 'I'm always that way'. I take something to mean that I can't be without it, and that's what that thing means to me. Without it I'm gone. This type of meaning is value, in the sense that once you identify with something it takes supreme value. To identify with something is the same as to say 'that is equivalent to my life'. So identification is that kind of a meaning. All nationalism is based on meaning, the identification with religion is meaning, the identification with money is meaning -- money itself is nothing but meaning.

Hankey: So you're saying that one would lose identification when one stopped projecting meaning.

Bohm: Perhaps in a certain sense. This fixed identification would go, but you would still know where you belong. However, you would no longer feel so attached to certain things that you could never consider changing them.

Questioner: Could dialogue also be used in the way Socrates used it, to break down opinions?

Bohm: l'm not in favor of that myself. You see, I don't think opinion should be broken down; I think opinions must be let go freely. Socrates was obviously far above most of these other people, he could do

almost anything he liked with them (laughter). If you look at the various people that dialogued with him, some of the results were not impressive, if you follow them through.

I think something more is needed, let's rather put it that way. If people start to talk and they have not thought about things very much, they are going to come out with a lot of stupid things. If they are simply told that they are stupid, they are going to keep quiet and say nothing and they are not going to think for themselves. Somehow we've got to go beyond this stage so that the confusion clears up and everybody participates. This is difficult, but I think not impossible.

For most of us intelligence is probably blocked by the rigidity of our mind. This rigidity is caused by the fixed meanings that we hold, and the creative intelligence that we might otherwise have is now blocked. Most stupidity, I think, is due to that. So we must question it, inquire into it.

Teemu Kassila: In my experience society is full of meanings and there are always people who try to tell me and others what the true meaning is so that one actually gets quite confused about what is the correct meaning.

Bohm: Yes, I understand -- that's why a dialogue is necessary. You see, you pointed out to me that people are trying to tell you what the meaning is; now that is not a dialogue (laughter) . In a dialogue you are going through a state where I tell you what things mean to me and you will listen and say what it means to you. I will learn something in this because I see it means something different to you -- it will go back and forth. So the meaning will be different at the end of the dialogue from what it was in the beginning.

Archer: Implicit in what you've been saying -- and you've also put it explicitly -- is that creativity has a high value. It is something that deserves attention. Are you proposing that in the social and cultural dimension dialogue is a means towards creativity?

Bohm: Yes. I am saying that, provided it is a true dialogue, it will release creativity. Take science, for example. It is already admitted that if scientists are constantly talking about their work, attending conferences, publishing, exchanging information, new ideas arise in a way that can hardly be noticed. It is still very limited, because people are defending their positions and worrying about the financial rewards they are going to get, and so on. But suppose all those pressures were to go; you would have free creativity in communication.

Archer: So really some energy ought to be put into the search for creativity.

Bohm: Yes, dialogue is necessary for creativity in the socio-cultural sphere; that is, this creativity cannot be sustained without dialogue. We may get a burst of creativity but it will not be sustained.

Archer: And you feel there's an urgent need for it -- that the state of society really requires and urgent dialogue?

Bohm: Yes. I think society is in a stage where it is fragmenting, and people are not able to talk to each other -- for the most part they ignore each other. Nevertheless, they depend on each other far more than ever before. This cannot go on, we cannot ignore people on whom we depend. Merely to confront them or to avoid them is not going to work.

Archer: Would you say that, on the whole, humanity has not understood that the world can have a different meaning to different people, and that there is no reason to fight because of these different meanings?

Bohm: Yes, and it's also not realized that there cannot be a final meaning. Thus, there have to be a lot of different meanings and we've got to find the relation between them. We have a plurality of meanings, but seek the unity in this plurality, and so on.

You see, the general culture contains the assumption that there's got to be one meaning that is right and the others are supposed to be wrong. The 'right' meaning is absolutely necessary and then it doesn't yield to the

others. It is just this kind of rigid 'right' meaning that often becomes a wrong meaning, as circumstances change. Culture *is* meaning, and when we have wrong meaning within culture, it is like misinformation.

So we can say there's not only information, there's also misinformation. A virus in the DNA molecule could be called a bit of misinformation, in that it enters the genetic structure and causes the cells to produce more viruses instead of more cells. it's the same way with cancer.

Society, too, is full of this sort of misinformation. We have various ways of dealing with biological misinformation. The best way is by the immune system which recognizes it and gets rid of it, but we have no such system in society. Misinformation accumulates and society gradually decays. You see, the older the society gets, the more chance it has to accumulate all sorts of misinformation and the more it starts to fall a part. The society is blocked because misinformation is held *rigidly*.

Hankey: But there's always renewal.

Bohm: Where's the renewal?

Hankey: The renewal comes from above.

Bohm: But where's the sign of it? You see, we are in danger of entering into a non-renewable situation -- it's a fact. I don't think we can count on the above to do it. There's also a statement which probably represents a more Western approach which is that 'God helps those who help themselves' -- that 'those who don't help themselves will get no help from above'. So if you are able to help yourself then you will also get the other help.

Hankey: That's certainly true, but it is also true that there is an ultimate meaning.

Bohm: There may be, but suppose you were somebody in a concentration camp in Nazi Germany, you wouldn't see that. All those millions of people who went through all that suffering and were exterminated, as far as they were concerned, except possibly a few of them, it had no meaning. And what would be the meaning of the whole world ending up in nuclear annihilation? The meaning would simply be that humanity was not viable and some other species must take over.

Questioner: Does love have a meaning?

Bohm: Oh yes, clearly it has meaning and it is meaning. But what interferes with it is this hardness, this rigidity of mind. In the intellectual side it comes out as rigidity of thought and on the emotional side as hardness of heart -- they are both one and the same thing. Therefore, what is needed is to loosen the rigidity of mind and to dissolve or melt the hardness of heart, and you cannot do one without doing the other. If somebody is not hard-hearted but his mind is very rigid, he will very quickly be in conflict and his love will vanish. Without the loosening of the rigid mind you cannot love, because sooner or later you'll come to a non-negotiable point with someone, and your love will vanish in the conflict. But I suggest that this rigidity of mind begins to loosen when we see the danger of non-negotiable positions.

Questioner: Isn't it mostly fear that causes rigidity, the fear of letting go of that little world of secure knowledge we've created?

Bohm: Yes, there's a fear of letting go, there's a fear of showing what a fool you are, and so on.

Kassila: So what is it we are avoiding? It seems to me that there is a sensitive area in all of us that we mostly ignore and are afraid to show to others. Sometimes I find it almost impossible to talk about it, and I just feel like crying for that 'being in me'

Bohm: Behind this sensitive being in us there is some sort of a meaning which has built up throughout the lifetime. It has come from the culture and it produces this fear, resistance and rigidity. There are several ways of approaching this problem. There's the approach of meditation which attempts to deal with this

problem at the individual level; and there is the attempt of psychiatry to get at some of this partly by going through childhood experiences. But there is also a third approach according to which a great deal of our anxiety is basically socio-cultural in origin and therefore best approached in a dialogue which is in a socio cultural context.

Kassila: But what would you say that 'being in us' is?

Bohm: Probably almost nothing -- it's misinformation at a central position. It's the same as with the DNA molecule. A tiny bit of misinformation in the DNA can cause everything to go wrong. If there is misinformation at a crucial part of the information that is determining a process, the consequences can be very serious. This can be the situation with the mind. Just a little bit of misinformation, say, in our image of ourselves, can distort the whole mind. We are not aware of it, but I think that our mind is so conditioned by such misinformation that it is frightened even to approach the question whether something is wrong with it.

Kassila: So in that sense we never live in total touch with what I call 'being in us'.

Bohm: Probably not. We are living in contact with an illusory being which is being projected by the misinformation. We have an illusory view of ourselves which is built up largely in a socio-cultural way. Most of our view of ourselves comes from society, doesn't it? For example, the fear of being a fool is a socio-cultural consequence, and also the fear of letting go. So a tremendous part of this fear is socio-cultural in origin. It is socio-cultural misinformation that is transmitted subliminally.

Therefore, if we can confront this in a group, we can see the principle and perhaps change.

Kassila: It seems to me that what you have described as meaning could take the same position as God or something supreme had before.

Bohm: Well, then you have to be careful. That's why I said this is a proposal and not a statement of what is true. I'm not claiming that what I say is the truth. It may have many reasons backing it up to make it plausible, but it is a proposal to be explored and not the final truth. As I said earlier, I don't think we can get an ultimate truth out of *any* exploration.

Questioner: But isn't it useful to have a belief in what you might call ultimate meaning. You could then say 'OK, whatever happens, I'm going to be safe, or the world is going to be safe'. That way you can give yourself security in the sense that even if you do something wrong, the ultimate meaning will protect you.

Bohm: Many people have tried that, but sooner or later most of them have lost their faith. Your faith will be tested very much, because things will happen that will make the ultimate meaning look very implausible. If You believe, for example, that there is a God, you might well say 'why has he arranged things in this way -- almost anybody could have done better (laughter) .

Now if you could actually discover this ultimate, then, by definition, there would be a true perception, which would be all right. But merely to postulate the ultimate meaning is dangerous, because it leads to the distortion of facts.

What I suggest is that we have to remain with uncertainty. The fear of uncertainty is our basic trouble. Uncertainty is the very nature of meaning and the very nature of being, for meaning is always context-dependent. We do not know the context that might come, and this is why we can never be certain that our meanings will be correct and give us security. So if you cannot live with this fact of uncertainty, some distortion is taking place already.

Questioner: Would meaning and reality exist without consciousness?

Bohm: I don't know. But what is consciousness without meaning? Consciousness is meaning. The content of consciousness *is* meaning, right?

Hankey: But you could also say that the experience of being arises when one stops projecting meaning.

Bohm: That may be so, but we have also got to use meaning or else we will not be able to get together. You see, we are now faced with a situation where people have to create a good society. I think man has several dimensions, the individual dimension, the socio-cultural dimension and the cosmic one. If we cannot live in all these dimensions, I don't think our culture is going to survive. If we don't know how to use meaning properly and in a harmonious way, then our culture is going to fall apart. A few people may have discovered a cosmic meaning, but when the rest of the culture is falling apart, their insight does not make much of a difference.

Briggs: Could you make a distinction between *projecting* meaning which sounds to me like it were a sort of rigid, holding on -- I take my meaning, put it out there and impose it on someone else -- and *finding* meaning? You seem to be talking about the latter in terms of creativity, as the activity of discovering meanings which is a creative insight.

Bohm: Yes, the creative insight of meaning is the crucial thing and also the creative communication, which means that people can listen to this creative insight and take it up themselves and go on with it. If everybody has got a rigid hold onto his meanings, somebody may have a great creative insight but then the other people won't be able to listen to that person. Then you have to have a battle to impose it, and it all goes to pieces.

Briggs: If someone has a creative insight in a dialogue, there's a process in which other people also have to find that meaning in their own way so that the meaning is the movement itself of the finding of meaning.

Bohm: Yes, every time somebody else sees that creative meaning, it makes a new context and changes the creative meaning in a creative way. So therefore the whole thing never stops. There is a possibility of creativity in the socio-cultural domain which has not been explored by any known society adequately.

I think, again, that the Eastern society tends to de-emphasize the socio-cultural sphere, it has not paid a lot of attention to it. It tends to fall apart in the early stages into family units and things like that. In the West this has been given more attention in places like ancient Greece which emphasized democracy· But insofar as we are trying to do the same thing we have have not been very successful.

Hankey: On the contrary, if you look at a place like Indonesia, the first of the five principles of integration means 'unity in diversity' and social justice is another one. Unity in diversity represents precisely that integration which corresponds to democracy in the West.

Bohm: So how is the unity to be achieved?

Hankey: By a common focus of purpose.

Bohm: I don't think that is enough, for then the purpose is fixed. It is essential to have the creation of purpose rather than a purpose that is focused on. You see, there is no fixed purpose. Meaning is purpose and as meaning develops creatively, purpose also develops. The whole point I'm trying to make is that, in this flow of meaning, purpose transforms constantly.

I don't think any society has ever really confronted this properly. For example, you might think of a very harmonious society where somebody at the top organizes it· He or she is a fairly good ruler and, of course, it will gradually decay as the next person is not quite so good, and so on. But that is not the point. The point is that *something new is needed; always was needed*. The fact that we are now approaching a general catastrophe is a challenge. I don't think that any traditional approaches can help us to deal with this challenge.