QUANTUM WHOLENESS, THOUGHT AND PERCEPTION

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The day I finished my schooling I said to a friend, 'That wasn't an education that was an accumulation'. I felt at 18, that something vital was amiss in how society and culture were looking at life, and my education had been a reflection of that. So began a tortuous journey with the usual dead ends and "car crashes".

If it's the travelling that matters not the arriving, an important point in my endless journey to make sense of my 37 years of life came in 1983 when I first encountered David Bohm. I had just started work as a physics teacher at Brockwood Park School where Bohm regularly visited to dialogue with the founder, J. Krishnamurti, and to talk to the school about his ideas on the processes of thought. My impression was one of a person who was unassuming and rather shy but one, who at the same time had a generosity of spirit and a humanity that came through when he talked about what deeply concerned him. As I got to know him better, I wondered also if, through his work in physics, his understanding of the limits of thought and knowledge had caused him to have a deep humility despite his achievements. Einstein considered him his intellectual heir, and the Dalai Lama greatly valued his talks with David Bohm. In my opinion, outside of physics, his best book is *Thought as a System*. But how did he come to focus on these thought processes from his well-known insights into wholeness based on his physics work?

For Bohm, quantum phenomena and relativity point to an "unbroken wholeness in flowing movement", and the equations of Quantum Mechanics point to a view of reality as a holistic movement (the holomovement) of enfolding and unfolding from the implicate (hidden) order to the explicate (perceivable) order. Niels Bohr had also spoken of this wholeness but this is usually ignored, and emphasis is given instead to Bohr's philosophical notion that the probabilities given by the equations are all that can be said about the quantum world and so these probabilities express the limits of knowledge. Bohm felt that although knowledge was inherently limited, this limit could be extended indefinitely, so the notion of wholeness implied by quantum phenomena could be articulated but not in any final way.

Bohm was working on his physics proposals right up to the last day of his life; the title of his last book *Undivided Universe*, written with Basil Hiley, indicates how wholeness was central to his thinking. That knowledge is always limited meant that seeking a theory of everything made no more sense to Bohm than seeking a final poem.

There are two or three aspects of wholeness that I have understood. The first is that for wholeness to have the depth of meaning, to be a significant concept, it follows that a main feature must be that it implies the unlimited. Though indeed quantum physics suggests wholeness, this wholeness cannot be limited to the quantum/atomic world. If it were so limited it would not have the unlimited feature wholeness must have by definition, so wholeness must reveal itself at all levels of reality not only the quantum, but also including the biological and the cosmic, amongst other levels, in a way that can't be reduced to a more fundamental level. For me, *Undivided Universe*, the name of Bohm's and Hiley's book, expresses this.

Bohm wrote an appendix to his book on relativity called *Physics and Perception* in which he related the findings of relativity—the observation that time dilates and length changes with high relative speed—to the way we develop our concepts of time and space as children. Bohm had noted Jean Piaget's observations and I particularly like the peek-a-boo example of the game that one plays with the very young. The suggestion is that the concept of "object permanence" (that something continues to exist after it has gone from immediate sight) has not yet developed in the child, so when something disappears and then reappears unchanged, for the child it is a

pleasant surprise. In such a manner we build up our notions of a fixed space in which unchanging things exist in a separate absolute time whether we behold them or not. But we lose sight of this kind of development of concepts of space and time and forget that they are only “relatively invariant” concepts. If we were to remember this, we would not be so surprised when they no longer hold in new domains of experience such as the very high speeds of the theory of relativity.
I found Bohm’s ability to relate the findings of physics to everyday experience and perception extremely helpful in clarifying my own sense that scientific perception is not essentially different from everyday perception. An important example of this similarity in perceptions is the notion that science is about collecting truths about nature or about getting closer to truths with new developments. There is no evidence for this view; indeed the history of science suggests otherwise. Despite this, some scientists still insist on talking about the possibility of a final theory of everything. The word theory, it should be remembered, is related to theatre and has the meaning of "to view". Bohm preferred the word proposal to theory. This is not just an issue for scientists but also for everyday processes of thought in which ideas and views about the world tend to become confused with a sense of truth about the world, the map with the territory, and so become too fixed and not open to evidence of what is new and different. Bohm used the collective term non-negotiable assumptions to express what this leads to. My experience is that this is a key factor at work when communication breaks down and people get disturbed, and defensive, when talking about important issues of life.

In dialogues at Brockwood, Bohm often pointed out that the use of words like all, always, everywhere and never, indicated ideas that had become too fixed because they were associated with a sense of totality. He gave *Deutschland über Alles* as an example of this, with its obvious disastrous consequences. Following on from this, it seems to me that wholeness must point to a movement beyond space and time and beyond what thought can grasp. Bohm saw that thought incoherently tries to grasp the unlimited, and he felt that for thought to come to its proper place there had to be a sense of, or insight into, the unlimited. This is why I believe he looked at thought and its processes, because without an uncovering and exploration of thought, the conditioned habits of thought will interfere beyond their proper place and cause problems in communication and relationships. With wholeness in particular, it could reduce it and turn it into another limited “thing”; or there might be a reaction against reductionism to create holism, thereby missing the subtle relationship between the whole and the part that Bohm discussed. I have found judgments, expectations and unexplored assumptions to be products of thought that are hindrances to any new way of thinking. This is key to what I learnt from Bohm and his work: that a healthy openness and courage, yes courage, is needed so that one can see the inevitable limitations and perhaps inadequacies, of one's deeply-rooted assumptions not just about science but about the whole movement of life.

I have also understood that quantum phenomena point to a new paradigm for physical reality, as these phenomena cannot be understood in the present paradigm; wholeness being the key indicator of the new, more coherent, view. Thomas Kuhn showed that there are no stepping-stones from an existing paradigm to a new one. The present paradigm in physics includes a view of physical reality as being reducible to the mechanical movement of particles in fields in a separate empty space. This is the paradigm implied in the way science is taught in schools and taken for granted by most scientists. It is almost 100 years out of date, but even Richard Feynman, for whom I have deep respect as an inspiring physicist, said that nature could only be understood through mathematics, implying a new paradigm is not necessary. For him, a new paradigm would be of interest only in an after-dinner conversation.
Professional physicists have had an overly negative response to Bohm’s work. Bohm welcomed criticism, but much of the criticism of him and his work has been ill-informed. The

physics community is as vulnerable to prejudice, jealousy and ambition as any other group, with a tendency to conservatism from the older members. It seems the younger generation of physicists are more open to Bohm's work, as his and Basil Hiley's quantum interpretation is still “on the table” with other interpretations that are now being considered. The tenacity of the present paradigm should not be underestimated because it operates unconsciously in our thinking and language. I have found in discussions with colleagues that the Cartesian subject/object division is as persistent as the past/present/future illusion that Einstein noted. It seems that without a clear new paradigm we have no choice but to communicate in terms of the present outdated one. Bohm implied that to see the limitations of the present paradigm and the divisive processes that support it, one needs to make a phenomenological move and pay close attention to the original phenomena, psychological and physical, without letting preconceptions interfere; and to look without judgment at what the phenomena tell one. Seeing the significance of this move is already participating in a new paradigm, a new way of thinking coming from understanding that it is how one looks that matters not so much what one looks at. This is what Bohm suggested we do with thoughts and "felts" (feelings held in memory, in the same way thoughts are "thinkings" held in memory). The new paradigm has to take account of actual lived experience in a way that the present one does not do and probably cannot do.

To bring this concretely into education is the challenge for me as a teacher. The starting point is to take wholeness not as an idea to aspire to but as what actually is. The issue then is that our cultural conditioning is divisive and fragmentary and denies wholeness, this conditioning goes very deep and is organized around our, out- of-date, worldview or paradigm as I have said above. My proposal is that to approach wholeness directly will not work as it will be assimilated into the “old” worldview and will not mean very much, so the intention of my course is to expose and examine the conditioning of this worldview and so bring to light its limitations.

My course at Brockwood with 17 and 18 year olds is a wide ranging series of activities that expose and examine the conditioned nature of how we see and think about the world. It is necessary to carefully choose those activities that expose conditioning, as normally it is transparent, which means, like my glasses, it shapes my perception and thinking but can’t be seen directly. During the activities it is a challenge to meet the intention but when students put in the engagement they find it intriguing and seem to sense that they are learning something worthwhile about conditioning. One example of an activity is to take a recent emotive issue or event in their lives and focus on how they are thinking about it and expose such things as any unexamined assumptions and what is taken for granted as obvious. Another activity of a different kind is to show how our perception is organized by what we know, habits and expectations using optical illusions and the drawings of Escher. The difference between now and the day I left school is that now I understand that the way I see the world is conditioned by an out-of–date paradigm. When the depth of this conditioning is seen for what it is, and so is quiet, then wholeness can come through and be experienced in the moment through such activities as looking, watching, seeing and listening. These seemingly simple activities then take on a new significance as ways to be open to the wholeness which is always there.

“The field of the finite is all that we can see, hear, touch, remember, and describe. This field is basically that which is manifest, or tangible. The essential quality of the infinite, by contrast, is its subtlety, its intangibility. This quality is conveyed in the word spirit, whose root meaning is “wind, or breath”. This suggests an invisible but pervasive energy, to which the manifest world of the finite responds. This energy, or spirit, infuses all living beings, and without it any organism must fall apart into its constituent elements. That which is truly alive in the living being is this energy of spirit, and this is never born and never dies”. © 1987 by David Bohm

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