Scientific theory/ David Bohm

http://en.wikipedia.org/wiki/Scientific_theory
Quoting from the above article
Scientific theory
A **scientific theory** comprises a collection of concepts, including abstractions of observable phenomena expressed as quantifiable properties, together with rules (called scientific laws) that express relationships between observations of such concepts. A scientific theory is constructed to conform to available empirical data about such observations, and is put forth as a principle or body of principles for explaining a class of phenomena.[1]

A scientific theory is a type of *inductive theory*, in that its content (i.e. empirical data) could be expressed within some formal system of logic whose elementary rules (i.e. scientific laws) are taken as axioms. In a deductive theory, any sentence which is a logical consequence of one or more of the axioms is also a sentence of that theory.[2]

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http://en.wikipedia.org/wiki/David_Bohm
from the above article:
Quantum theory and Bohm-diffusion

During his early period, Bohm made a number of significant contributions to physics, particularly to quantum mechanics and relativity theory. As a post-graduate at Berkeley, he developed a theory of plasmas, discovering the electron phenomenon known now as Bohm-diffusion. His first book, *Quantum Theory* published

in 1951, was well-received by Einstein, among others. However, Bohm became dissatisfied with the orthodox interpretation of quantum theory, which he had written about in that book, and began to develop his own interpretation (De Broglie–Bohm theory) — a non-local hidden variable deterministic theory the predictions of which agree perfectly with the nondeterministic quantum theory. His work and the EPR argument became the major factor motivating John Bell's inequality, the consequences of which are still being investigated.

Thought as a System

Bohm was alarmed by what he considered an increasing imbalance of not only man and nature, but among peoples, as well as people, themselves. Bohm: "So one begins to wonder what is going to happen to the human race. Technology keeps on advancing with greater and greater power, either for good or for destruction." He goes on to ask:

What is the source of all this trouble? I'm saying that the source is basically in thought. Many people would think that such a statement is crazy, because thought is the one thing we have with which to solve our problems. That's part of our tradition. Yet it looks as if the thing we use to solve our problems with is the source of our problems. It's like going to the doctor and having him make you ill. In fact, in 20% of medical cases we do apparently have that going on. But in the case of thought, it's far over 20%.

In Bohm's view:

...the general tacit assumption in thought is that it's just telling you the way things are and that it's not doing anything - that 'you' are

inside there, deciding what to do with the info. But you don't decide what to do with the info. Thought runs you. Thought, however, gives false info that you are running it, that you are the one who controls thought. Whereas actually thought is the one which controls each one of us. Thought is creating divisions out of itself and then saying that they are there naturally. This is another major feature of thought: Thought doesn't know it is doing something and then it struggles against what it is doing. It doesn't want to know that it is doing it. And thought struggles against the results, trying to avoid those unpleasant results while keeping on with that way of thinking. That is what I call "sustained incoherence".

Bohm thus proposes in his book, *Thought as a System,* a pervasive, systematic nature of thought:

What I mean by "thought" is the whole thing - thought, *felt,* the body, the whole society sharing thoughts - it's all one process. It is essential for me not to break that up, because it's all one process; somebody else's thoughts becomes my thoughts, and vice versa. Therefore it would be wrong and misleading to break it up into my thoughts, your thoughts, my feelings, these feelings, those feelings... I would say that thought makes what is often called in modern language a *system*. A system means a set of connected things or parts. But the way people commonly use the word nowadays it means something all of whose parts are mutually interdependent - not only for their mutual action, but for their meaning and for their existence. A corporation is organized as a system - it has this department, that department, that department. They don't have any meaning separately; they only can function together. And also the body is a system. Society is a system in some sense. And so on. Similarly, thought is a system. That system not only includes thoughts, "felts" and feelings, but it includes the state of the body; it

includes the whole of society - as thought is passing back and forth between people in a process by which thought evolved from ancient times. A system is constantly engaged in a process of development, change, evolution and structure changes...although there are certain features of the system which become relatively fixed. We call this the *structure*.... Thought has been constantly evolving and we can't say when that structure began. But with the growth of civilization it has developed a great deal. It was probably very simple thought before civilization, and now it has become very complex and ramified and has much more incoherence than before. Now, I say that this system has a fault in it - a "systematic fault". It is not a fault here, there or here, but it is a fault that is all throughout the system. Can you picture that? It is everywhere and nowhere. You may say "I see a problem here, so I will bring my thoughts to bear on this problem". But "my" thought is part of the system. It has the same fault as the fault I'm trying to look at, or a similar fault. Thought is constantly creating problems that way and then trying to solve them. But as it tries to solve them it makes it worse because it doesn't notice that it's creating them, and the more it thinks, the more problems it creates. (P. 18-19)

Bohm views physical processes are determined by information of more and more subtle levels which interact, and does not limit this consideration to matter alone. In an article of 1990, *A new theory of the relationship of mind and matter*, he resumes his view that there exists a close link to mental processes: "the whole notion of active information suggests a rudimentary mind-like behaviour of matter". In his view, mental processes as well can be understood as representing levels of activity of increasing subtlety which act upon each other. He recalls that thought is intricately connected with physical reactions, as is known from everyday experience. Yet on the mental side, action as response to information need not be immediate; rather, in some cases at least, it can be mediated by

“suspension” of physical action and the resulting train of thought. Bohm suggests that the mental and the physical side, which he sees as two “poles” of a unified whole, are closely interlinked and that “at each level, information is the bridge or link between the two sides”. A relationship between the mental and matter may exist at indefinitely great levels of subtlety, while nonetheless each kind and level of mind may have a relative autonomy and stability. His article concludes with the statement that “knowledge of matter (as well as of mind) has changed in such a way as to support the approach that has been described here. To pursue this approach further might perhaps enable us to extend our knowledge of both poles into new domains”.[7]

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