

reason for this emphasis is Bohm's own interest in and concern with both these subject matters and how they relate to his model of wholeness.

Bohm's view of wholeness appears to have come from two quarters; firstly, as a reaction to the severe limitations of Cartesian dualism and its deleterious effects on science; and secondly as a broad interpretation that has grown out of research and experiments in quantum science. What then are the characteristics of Bohm's model of wholeness? He identified these characteristics by using the example of a hologram as a way of describing the interactive nature of undivided wholeness. Yet he also produced his own theory of wholeness in *Wholeness and the Implicate Order*. We take the example of the hologram first.

A hologram is created when coherent laser light is reflected (or scattered) from an object and collected on a photographic plate along with part of the original laser beam. The two beams interfere to generate a standing wave pattern which is recorded directly on the plate. The intensity on the photographic plate is the square of the sum of the amplitudes of the reflected (or scattered) light and the reference beam. After development, the photographic plate can be illuminated with a laser beam that interacts with the interference pattern to produce a three-dimensional image that looks like the original object, but this image appears to us if we are looking through a window.

The significant feature of the hologram that Bohm focussed on was the complex relationship between the parts and the whole. In a hologram the local regions of the original object are mapped into every region of the hologram and if a laser beam is used to illuminate only a small fragment of the photographic plate, we do not see a fragment of the image but instead, we see the whole image in somewhat less sharply defined detail. What does this tell us about the interactive and wholeness character of the hologram? It tells us that each fragment of the image is not only a part of the whole but also it is an instance of the whole. That means that the whole of the hologram inheres in or is immanent within each fragment or part while each part contributes to the whole.

These interactive relationships between parts and whole that are produced by coherent light in holograms can be called symmetrical. That means these holographic relationships can be detailed as: 'whole-to-part /part to whole' relationships. In addition, the unifying force that holds the parts and the whole together is structured by a complex of whole-to-part/part-to-whole relations that exhibits a symmetrical force or

unity. This force creates the indivisible unity of the hologram so that the parts, while still distinct are locked together into the whole image in ways that cannot be separated or divided into separate or linear series. Bohm used the example of the hologram to discuss the universal nature of wholeness in that each region of space: 'the movement of light implicitly contains a vast range of distinctions of order and measure, appropriate to a whole illuminated structure. Indeed, in principle, this structure extends over the whole universe and over the whole past, with implications for the whole future'. [2, p.148]

Hence, the example of a hologram became an interactive model having a scope that takes in the whole of space and time of the universe. In this sense, his wholeness model does incorporate everything in the universe. But Bohm also developed his own theory of universal wholeness which was supported by the interactive character of the hologram. This was his theory of the implicate and explicate orders. The explicate order represents the explicit differential forms and objects (the parts) that move within of the physical world of space and time and which we will now say, arise through the local mind's processes of perception. In contrast, Bohm's implicate order represents the entire universal context of a singular, whole and unified interconnected system – an undivided universe. The entire implicate order can be described as having unifying qualities but devoid of quantities, rather quantities are the central feature of the explicate order.

The universe wide unifying context of the implicate order is entirely implicit, a term that Bohm suggests is based on the verb 'to implicate', which means 'to fold inwards'. [2, p.149] He speculated that each region of space and time 'contain a total structure 'enfolded' within it'. Hence, the implicate order can be described as an enfolding order while in contrast, the explicate order unfolds from the implicate order the moving forms and objects of the explicit and physical universe. This means that all physical objects and forms observed to be moving in the continuum of space and time represent the explicate order, which unfolds from the implicate order. From a Cartesian perspective, the explicate order is the first and only order of importance.

The relationship between Bohm's two orders is not dualistic but highly integrated in that the explicate order arises out of the movements of the implicate order and together these two orders produce an undivided universe, which is a wholeness where there are no separations or gaps. At times Bohm refers to the totality