

# The Wholeness of Nature

## Goethe's Way Toward a Science of Conscious Participation in Nature

### Henri Bortoft

(Reviewed By John Barnes)

Few recognize the depth of the existential crisis into which our modern scientific worldview has led us. Through its analytical approach to material processes, it has come to focus on a molecular realm far removed from the world of our human experience. This narrow focus has evoked a countermovement calling for the recognition of personal experience and yearning for meaning and wholeness. The result is an unhealthy polarization of our culture in which there is a yawning gap between objective, materialistic science on the one hand and subjective culture of human experience on the other.

What is urgently needed today is a further step in the evolution of science, leading beyond material analysis to a deeper, holistic understanding of nature. In *The Wholeness of Nature*, Henri Bortoft describes how already 200 years ago Goethe, the great German poet and scientist, began to lay the groundwork for this new development in science. I know of no other book written in the English language that articulates the principles of Goethe's scientific approach as clearly as this work. And I take particular pleasure in reviewing it for those involved in Waldorf education, for I know from my own experience as a teacher that Goethe's way of knowing is fundamental to Waldorf education itself.

Henri Bortoft was introduced to the problem of wholeness by David Bohm, who guided him as a graduate student working toward his doctorate in quantum physics. His subsequent research under J. Bennett into perception visualization further prepared him for his discovery of Goethe's science. Bortoft's life-long interest in Goethe's scientific method led to penetrating studies of the process of cognition and of the history of science, the results of which are found in this, his major work.

The book opens with his essay on Authentic and Counterfeit Wholes. He begins by describing how, when a laser-illuminated hologram is cut into a number of parts, the whole picture appears in each of the fragments. Similarly, light from the whole of the starry heavens is enfolded in each point in space from which a picture of the night sky can be seen. Thus, in an authentic whole, each part is a place in which the whole can be present. Using such examples as a template for thinking, he goes on to show how, in reading, the whole of a text (its meaning) is revealed through its parts as we read it word-by-word and sentence-by-sentence. Each part reveals a different aspect of the whole.

By contrast, the conventional concept of wholeness (upon which reductionist science is based) involves an additive process by which a whole is achieved through the integration of parts. Whereas authentic wholeness is characterized by the primacy of the whole and its presence in each of its parts, a counterfeit whole is no more than an abstraction used to identify an assemblage of parts.

It becomes clear that an authentic whole cannot be grasped as an object. The meaning of a text or the life of an organism manifest through their material parts, but they are not the same as their parts. They remain hidden to an approach for which objects are the only reality. "So it is that science today, by virtue of the method which is its hallmark, is left with a fragmented world of things which it must then try to put together." (p. 17)

In the course of this first essay it becomes clear that Goethe's way of doing science requires an altogether different kind of cognitive activity from that of mainstream science. This difference is addressed in the second essay, *Goethe's Scientific Consciousness*, in which Goethe's approach to the science of color is

contrasted to Newton's. Bortoft describes how Goethe participated in the "coming into being" of the prismatic and atmospheric colors until he was able to recreate this process in exact imagination. At this point the dynamic lawfulness of this process becomes a matter of direct intuitive experience. Bortoft emphasizes that this inner unity or wholeness of the world of color, though it is not given through sense experience, is nevertheless the deeper dimension of the phenomena themselves.

Newton was not so much interested in colors as such, or in their interrelationships. He was intent upon explaining them in terms of an underlying causal mechanism. His theory was that colorless light consisted of rays of differing refrangibility that could be separated out through a prism and then experienced as the colors of the spectrum. Each subjectively experienced color quality corresponded to an objective, quantifiable angle of refrangibility. By explaining a phenomenon as an effect brought about by a material cause, Newton's approach diverts our attention away from the phenomena themselves to an entirely different realm, amenable to quantitative treatment. These explanations are useful for manipulating the phenomena, but they say nothing about the nature of the colors themselves.

In the third and longest section of the book, *Understanding Goethe's Way of Science*, the author speaks of the wholeness that constitutes the deeper dimension or lawful interrelatedness of the phenomena as their organizing idea with sensory particulars. He makes a sharp distinction between the organizing idea that plays a constitutive role in our experience and intellectual ideas that are later abstracted from experience. Whereas the former participate actively and livingly in the essential nature of the world, the latter are dead abstractions that can be taken up by the logical manipulations of the intellect.

Through fascinating examples, Bortoft masterfully illustrates the role of the organizing idea in everyday experience, in observational discoveries and in scientific theories. He elaborates the dynamic idea of authentic wholeness as it lives in Goethe's view of plant metamorphosis and Wolfgang Shad's insights into the evolution of the vertebrates.

Another approach is taken in the chapter on the Twofold, in which the thinking of Wittgenstein, Barheld, Heidegger, Kühlewind and others is brought to bear on the problem of wholeness. We are led anew to the "double" vision of sensory and imaginative seeing.

Bortoft ends the book with thoughts on the cultural implication of Goethe's way of science:

*No matter what the specific content may be, the higher-level content that this science carries will be the holistic way of seeing. Hence this way of seeing could be transmitted culturally by the science of the wholeness of nature, as the analytical way of seeing has been transmitted by the science of quantity. This could be the cultural significance of the way of science pioneered by Goethe. (p. 330)*

It is hardly possible to indicate the richness of this groundbreaking work. Perhaps even more important than the content however, is the fact that it is written out of a holistic consciousness, so that the whole can be livingly experienced as it is elaborated in each sentence and paragraph. This is what makes this book a very accessible and lively introduction - as well as an exercise of - the holistic way of seeing.