The entire machine of life and of the Universe itself evolves toward ever more complex states, as if a ghost were operating the machine.

The Holonic Revolution
Holons, Holarchies and Holonic Networks
The Ghost in the Production Machine

di Piero Mella

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TOPIC AREA: Economics and statistics

A minor conceptual revolution has been under way for less than forty years now, beginning in 1967 with the publication of Arthur Koestler’s The Ghost in the Machine – a phantasmagorical book in terms of the breath and variety of its content – which formally introduced the concepts of holon and holarchy (the hierarchical ordering of holons). Koestler’s idea is clear and simple: in observing the Universe surrounding us (at the physical and biological level and in the real or formal sense) we must take into account the whole/part relationship between observed ‘entities’.

In other words, we must not only consider atoms, molecules, cells, individuals, systems, words or concepts as autonomous and independent units, but we must always be aware that each of these units is at the same time a whole – composed of smaller parts – and part of a larger whole. In fact, they are holons. The entire machine of life and of the Universe itself evolves toward ever more complex states, as if a ghost were operating the machine.

The concepts of holon and holarchy have since been used, especially in recent times, by a number of writers in a variety of disciplines and contexts, and these concepts are rapidly spreading to all sectors of research. In particular these concepts are more and more frequently found in the literature of physics, biology, organizational studies, management science, business administration and entrepreneurship, production and supply chain systems. Connected to these ideas are those of holonic networks, holonic and virtual enterprises, virtual organizations, agile manufacturing networks, holonic manufacturing systems, fractal enterprise and bionic manufacturing.

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