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LE CONCEPT D'INTÉRACTION : CROISEMENTS ENTRE BIOLOGIE, LOGIQUE ET PHILOSOPHIE

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Interaction is a key concept in contemporary science. It plays an essential role in biological research – in the living world everything seems to be the result of an interaction, inside and outside the organism. Fundamental phenomena such as development, metabolism and evolution boast a number of interactions among specific actors: cellular or genetic regulatory networks, individuals, populations, environments. Yet, although the term already existed in 19th century, only since the 1970s the concept of interaction became widely used in life sciences. Why is this notion so relevant and useful in biomedicine, but at the same time only a recent acquisition in this field? Are we facing an ‘epistemological breaking’?

To solve this riddle, a larger epistemological picture is needed. In the early 20th century, interaction was clearly defined by quantum physics and Gestalt theory, relying on the ideas of non-linearity, complementarity and coordination of processes, structures or relations and has later been transferred into the biological field, becoming one pivotal concept.

This work proposes to define this peculiar transition an “epistemological exaptation” – witnessed by the emergence of new concepts, such as complexity, emergence or network, and new perspectives in biomedical research, ranging from complex systems models to neurosciences and oncology. The geometrical approach in linear logic by Girard is presented to suggest a possible epistemological basis for framing the living state of matter. All these diverse, albeit converging, descriptions of interaction offer one explanation of living beings beyond the venerable mechanist-vitalist controversy, outlining the emergence of a new epistemological space.

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