

*Extending Philosophy of Biology:
A Roundtable on New Methodologies and Domains, from Cartography to Cancer*
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Interested Public

Session Abstract

Philosophy of Biology continues to develop, even explode. Similarly to the universe's expansion, however, our field's growth has hardly been uniform in all directions. Thematic clusters with highly specialised debates and agendas exist as practically separate universes. While such a divide-and-conquer strategy permits real progress by teams of researchers sharing thematics and commitments, it also encourages conservative tendencies that stultify creativity. In this roundtable, we invite philosophers of biology, as well as historians, sociologists, anthropologists, and psychologists (etc.) of biology, to reflect on new kinds of domains, methodologies, and questions that might benefit the further evolution of the field. Each speaker will speak for 15 minutes, and then there will be a roundtable of 20 minutes in dialogue with each speaker and his respective themes of "New Domains" and "New Methodologies." At the end, we should have 20 minutes left for a general roundtable. We invite reflection on a diversity of new socially engaged questions extending philosophy of biology. We bootstrap discussion by providing two examples of how to extend philosophy of biology. (There is recent work on each of our examples, but they are not, yet, considered a proper part of philosophy of biology.) First, in "Cancer: An Extended Philosophical Approach," Valadez Blanco reflects on the domains of philosophy of biology. What would a philosophy of cancer look like? Might a philosophy of cancer move beyond epistemological and methodological matters, turning to urgent ethical, sociological, or political questions? Second, in "Maps as Vehicles of Scientific Explanation," Winther examines methodologies of philosophy of biology. Consider the map analogy, most nakedly stated as "scientific theory is a map of the world." This analogy is explored by many general philosophers of science. How might philosophy of biology benefit from this pluralistic and perspectival image of science?

Cancer: An Extended Philosophical Approach

Octavio Valadez Blanco (UNAM)

The cancer sciences are guided by two questions: What is the best explanation of cancer etiology? What are the best cancer prevention and intervention strategies?

One general trend in studies of cancer is to unify or integrate research criteria and standardize clinical responses (e.g., World Cancer Report 2014). This integrationist trend tends to focus on genetic-mechanistic explanations. A philosophical approach could clarify important debates that currently are not discussed clearly: the basic entities (i.e., *ontology*), the models and explanations (i.e., *epistemology*), and the empirical criteria and therapeutic strategies (i.e., *methodologies*). More importantly, an extended philosophical approach would address cancer as a multi-causal disease related to environmental factors and social contradictions. It is for this expanded vision of illness that a philosophy of cancer sciences should not be confined to the epistemological analysis of biological models, but should expand into the social and historical domains of its phenomenology.

My philosophical proposal is that a philosophical approach of cancer sciences must be considered at least four types of questions covering the experiences of cancer:

- 1) Ethical: Who is cancer, and who is involved in cancer? – an investigation of the subjects suffering from the disease and the social “scaffolding” around them.

- 2) Socio-historical: Why is cancer a global disease? – the social causation of cancer is here explored (e.g., as an occupational disease)
- 3) Scientific: What is cancer? – a study of cancer’s biological ontologies and causal mechanisms
- 4) Prospective: which hopes should we fight for? – while we would like to cure cancer(s), an investigation of the conditions of possibility for cures, and what we can reasonably expect, and which political and ethical promises we can defend is urgent

My proposal seeks to establish a transdisciplinary approach and multiple criteria for establishing plans to combat cancer locally and globally.

Maps as Vehicles of Scientific Explanation

Rasmus Grønfeldt Winther (UC Santa Cruz)

Maps serve as a resource in diverse kinds of scientific explanations. The use of geographic maps in ecology, for instance, permits identifying parts and processes relevant to explanations mediated by mathematical idealized models. Other more metaphorical maps recasting “space” at small scales and in non-geographic ways, such as maps of biochemical systems, of cancer gene regulatory networks (GRN), or of cell lineage differentiation, can be used for causal or mechanistic explanations, or what I have elsewhere called “part-whole explanations.” Similarly to the maps cartographers study, biochemical, GRN, or fate maps present information using symbols, scales, and a map key. They are also products of abstraction processes (in cartography: e.g., *simplify*, *smooth*, *aggregate*, and *omit*). In rendering complex information cognitively digestible, these maps identify and situate parts vis-à-vis their relations to other components, at potentially overlapping hierarchical levels. Mechanistic explanations can thus be inferred from these maps. (While they may also be understood as diagrams or pictures, thinking of these visualizations as maps sheds light on their plural and perspectival nature not otherwise so clearly shown by a diagrammatic or pictorial analysis.)

As I furthermore argue in *When Maps Become the World* (University of Chicago Press, under contract), the map analogy, most nakedly stated as “scientific theory is a map of the world,” is pervasive in the work of many philosophers of science, including Ronald Giere, Nelson Goodman, Philip Kitcher, Thomas Kuhn, Helen Longino, Michael Polanyi, Stephen Toulmin, and Bas van Fraassen. Analogizing scientific theories to maps brings to the fore the abstracting and idealizing practices undergirding scientific representation, as well as the pluralism and perspectivism of scientific knowledge. The map analogy is an important resource for reimagining the structure of scientific theories and science as a process.