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*Spyridon A. Koutroufinis (Ed.)*

# LIFE AND PROCESS

TOWARDS A NEW BIOPHILOSOPHY

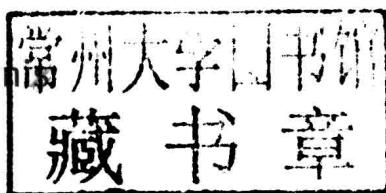
PROCESS THOUGHT

# Life and Process

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Towards a New Biophilosophy

Edited by  
Spyridon A. Koutroufin



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**Life and Process**

# **Process Thought**

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Edited by

Nicholas Rescher, Johanna Seibt, Michel Weber

## **Volume 26**

*To the memory of Reiner Wiehl (1929-2010), the spiritus rector of  
German Whitehead research.*

# Preface

Isaac Newton famously remarked that if any of us can claim to see further “it is by standing on the shoulders of giants.” We present here a new biophilosophy, our vista achieved by standing on the shoulders of Alfred North Whitehead, one of the greatest philosophers and scientists in history.

In deciding that we should present in a single volume our ideas about the relevance of Whitehead’s metaphysics for 21<sup>st</sup> century biosciences, I was inspired by conversations with American and European colleagues whom I met at conferences and workshops on process philosophy over the past decade. Editing this volume has advanced my understanding of how Whitehead’s metaphysics can become the philosophical foundation for a biology that surpasses the machine-metaphor prevalent in biology today.

One of the main challenges of this century is finding ways to describe biological phenomena at all scales as persisting processes rather than as systems of fixed parts with specific functions, a very demanding challenge given the dominance of reductionistic and mechanistic ontologies in academic biology.

The book addresses subjects that, at first, may seem to be widely divergent. I hope that after having read this volume the reader will agree that Whiteheadian metaphysics offers the ideal background for considering these topics as mutually interdependent dimensions of a new and truly integrated biophilosophy.

We dedicate this book to Reiner Wiehl, a pioneer and strong campaigner for our new Whiteheadian perspective. Wiehl, who was a research fellow and the assistant to the eminent hermeneuticist Hans-Georg Gadamer, was a tenured professor for philosophy at the University of Heidelberg until his retirement in 1997. He was one of the advisors of my habilitation thesis *Organismus als Prozess (Organism as Process)* which I completed in the Institute for Philosophy of the Technical University of Berlin in 2009. I owe tribute to Reiner Wiehl for many deep insights into the significance of Whitehead’s thought. He was working on a chapter for this volume when he passed away.

We miss him and wish he were here with us today to celebrate this book's publication.

Spyridon A. Koutroufinis

University of California, Berkeley,  
October 2013



# Acknowledgments

I have had to edit this book in a language that is not my native tongue. I would not have overcome the many obstacles without the great support of my colleagues Terrence Deacon, Robert Valenza, Andrew Packard, and Jonathan Delafield-Butt.

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# Introduction: The Need for a New Biophilosophy<sup>1</sup>

SPYRIDON A. KOUTROFINIS

Alfred North Whitehead is often regarded as the most original innovator of 20<sup>th</sup> century philosophy of nature and metaphysics. In recent decades a number of leading theoretical physicists have introduced ground-breaking new perspectives on fundamental issues of physics on the basis of his process philosophy. In contrast most biologists have not seriously questioned the Cartesian metaphysics of 19<sup>th</sup> century classical physics and only just begun thinking about possibilities of overcoming it. This book aims to contribute to the foundation of a new direction in biophilosophy which goes beyond many of the core metaphysical assumptions of contemporary mainstream biology. All of the co-authors of this volume treat central metaphysical questions about the nature of life from the perspective of Whitehead's process philosophy. These questions are crucial for the biosciences, but cannot be addressed by them since they touch on metaphysical issues.

In order to show the plausibility and the sense of this enterprise, first I will explain why I believe it is necessary to differentiate between biophilosophy and the philosophy of biology. Second I will review some of the shortcomings of today's biology and philosophy of biology and demonstrate how a biophilosophy grounded in a process-oriented metaphysics can overcome them. Third, I will provide a summary of Whitehead's process ontology, emphasizing those fundamental ideas from this paradigm that play essential roles in the present book. Finally, I will briefly describe the main ideas presented in subsequent chapters.

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<sup>1</sup> I gratefully acknowledge the editorial help and critical remarks of Terrence Deacon, Robert Valenza, Andrew Packard, and Jonathan Delafield-Butt.

## 1. Biophilosophy and Philosophy of Biology

Philosophy of biology is a discipline which was founded in the early 1970s by the efforts of Michael Ruse (1973) and David Hull (1974), but which had also had some precursors (Beckner 1959). The best-known representatives of this discipline, which has become especially established in the Anglo-American world, are theoretical biologists and philosophers.<sup>2</sup> Many authors also refer to the philosophy of biology as “biophilosophy”. However, I do not think that these two labels should be used synonymously. I describe “biophilosophy” as a philosophic tradition existing since antiquity which includes a set of very different, heterogeneous philosophic considerations of life. From this point of view, philosophers of biology constitute only one subgroup within the broader category of biophilosophy, even though they are arguably the most influential group today.

There are two reasons why I suggest making this distinction between biophilosophy and philosophy of biology and consider the latter to be included in the former: First, considering biophilosophy to be the metaphysically more broadly conceived field allows one to point to the relevance of the works of philosophers like Aristotle and Kant to current biosciences without characterizing them as “philosophers of biology”, which could be somewhat misleading given that the term “biology” was only introduced at the beginning of the 19<sup>th</sup> century when this discipline was founded. Second, in contrast to most scholars who understand themselves as philosophers of biology, and who, in their reflections about matter and causality, almost never contravene the basic metaphysical framework dictated by today’s mainstream biology, the philosophical presuppositions of the biophilosophers follow very different metaphysical systems. This being said, however, it is important to note that the borders between both fields are fluid

The most important Western thinkers of biophilosophy who will remain relevant in its future are Aristotle and Kant. Other philosophers and scientists with considerable influence on biophilosophy are William Harvey,

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<sup>2</sup> Some of the most influential contributions to philosophy of biology have been provided by Francisco Ayala, Theodosius Dobzhansky, John Dupré, Steven Gould, Paul Griffiths, Richard Lewontin, Huberto Maturana, Ernst Mayr, Susan Oyama, Alexander Rosenberg, Elliott Sober, Kim Sterelny, and Francisco Varela.

Gottfried Wilhelm Leibniz, Wolfgang von Goethe, Carl Gustav Carus, Gustav Theodor Fechner, Charles Darwin, Ernst Haeckel, Friedrich Nietzsche, Henri Bergson, Hans Driesch, Alfred North Whitehead, Charles Sanders Peirce, Jakob von Uexküll, Kurt Goldstein, Georges Canguilhem, Viktor von Weizsäcker, Adolf Portmann, Hans Jonas, Michel Foucault, and Gilles Deleuze. Recently, many contemporary bioscientists have provided new conceptions of organism, evolution, and consciousness which clearly transcend the frame of mainstream philosophy of biology.<sup>3</sup>

All forms of biophilosophy, including philosophy of biology, deal with questions that arise out of biology but which biology cannot answer. The central question revolves around our understanding of the concept of “life” – its meaning or semantic extension. In 20<sup>th</sup> century biophilosophy, this concept has a wide spectrum of connotations. On one level, “life” refers to the totality of processes which occur in any given physical entity that is described as an “organism”. On another level, this concept refers to sets of such entities. So “life” often refers to a group of organisms of the same species (e.g., an animal colony) or to the interacting species of an ecosystem or even to the entire biosphere. Frequently “life” means all organisms which have come into being since the appearance of the first cell on the early earth, with some bioethicists even using this concept to refer to all future organisms. Sometimes the concept of “life” also includes hypothetical biological developments which could occur outside of the earth (exobiology), thus going beyond the spatiotemporal limits of evolution on earth. These different facets of the term “life” are present in virtually all of the forms of contemporary biophilosophy. The only really controversial question is whether real or potentially real products of the “Artificial Life” (AL) project, i.e., computer simulations of organisms and ecosystems (e.g. Tierra or Daisyworld), “intelligent” robots, or future self-reproducing automata (which would be physical entities rather than computer simulations), should be included in the category of “life”. Proponents of the so-called “strong AL” follow John von Neumann’s position that life is a specific form of dynamics which can be abstracted away from any particular medium (1966). Interestingly enough, some postmodern biophilosophers, although their methods have nothing in

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<sup>3</sup> Kauffman 2008, 2002, 2000; Deacon 2012, 2006; Hameroff 2007, 2003; Hameroff and Tuszynski 2004



common with the analysis methods of the natural sciences, support the strong AL project insofar as they often include real and possible future products of the AL project in the phenomenon of “life”.

The differences between the varying forms of biophilosophy become clearer in the context of the question about the *nature* or *essence* of life. Here, too, biophilosophers influenced by Deleuze and other postmodern thinkers hold a distinctive position. They reject the idea that life has an “essence”, underscoring instead the incomprehensibility of the phenomenon, namely its tendency to transcend any characteristics (Thacker 2005). Other biophilosophers, who do not follow postmodernism, consider the question of the *nature* or *essence* of life to be pivotal. Their answers reveal the basic metaphysical ideas with which they operate, which may vary considerably between different thinkers.

Today’s philosophy of biology is built upon metaphysical assumptions about matter, causality, and mental agency (and their respective places in the cosmos) that are substantially different from the metaphysical assumptions of Aristotelian, Jonasian, Whiteheadian and other biophilosophy. Most philosophers of biology follow the metaphysical principles of classical physics, of course in a version that is expanded to include the idea of dynamical systems, which include the theories of complexity, self-organization, and chaos. For the purposes of this volume, the following basic metaphysical principles are important, since they are explicitly rejected by biophilosophers who have a process-metaphysical or other perspective:

- Mental activity is inseparably connected to brain activity. Plants, simple multi-cell organisms and single-cell organisms do not experience anything. The ability to experience arose relatively late in the history of evolution and is reducible to complex physicochemical patterns of activity in neural systems.
- Mental or other factors which cannot be reduced to physicochemical processes possess no causal relevance for biological occurrences. Mental states are irrelevant to ontogenesis<sup>4</sup> and evolution, even though they may

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<sup>4</sup> Aristotle, on the other hand, argues that mental factors have an effect on and form matter, and makes them the foundation of his teleology (Koutroufinis, this book, section 2.3).