

## Posthuman Views of Mind in Life

Tongwei Liu<sup>†</sup>, Xinzhe Jin<sup>†‡</sup>, Da Dong<sup>\*†‡</sup>, Wei Chen<sup>\*†‡</sup>

### Abstract

In this article, we provide a book review on Hengwei Li's new book, "*The Biotic View of Mind and Issues of Posthuman Society*." The author presents a groundbreaking perspective, the biotic view of mind, which is known as the strong continuity view within the life-mind continuity thesis, resonating with pragmatism and predictive processing theory. Furthermore, this viewpoint is extended to the real-life context on intelligent technology and the forms of posthuman society, offering valuable insights for navigating the development of future society. Lastly, the author addresses the opposition and conflicts between the "two cultures" in cognitive science and proposes three potential solutions to this existing predicament. Given that this book spans philosophy, biology, psychology, neuroscience, and cognitive science, we believe it can inspire researchers and advanced students alike.

**Key Words:** the biotic view of mind, the life-mind continuity thesis, autopoiesis, artificial intelligence, post-humanism, cyborg, the third culture

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*Both of these, and indeed almost all the rest of my published scientific work, have been driven by a need to understand what it is about organisms that confers upon them their magical characteristics, what it is that sets life apart from all other material phenomena in the universe. That is indeed the question of questions: What is life? What is it that enables living things, apparently so moist, fragile, and evanescent, to persist while towering mountains dissolve into dust, and the very continents and oceans dance into oblivion and back? To frame this question requires an almost infinite audacity; to strive to answer it compels an equal humility.*

Rosen, 1991; p. 11

**Corresponding author:** \*Da Dong, \*Wei Chen

**Address:** †Center for Brain, Mind and Education, Shaoxing University, Shaoxing, China; † Department of Psychology, Shaoxing University, Shaoxing, China

**e-mail** ✉ [feixiandd@163.com](mailto:feixiandd@163.com); [anti-monist@163.com](mailto:anti-monist@163.com)

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## Introduction

Influenced by the philosophical tradition of substance dualism, modern science has often discussed life and mind within distinct realms. However, human experiences, cognition, and understanding of mental phenomena (such as perception, memory, emotions, thoughts, consciousness, language, etc.) originally and necessarily derive from natural life (human existence). In other words, the entrenched dualistic intuition conflicts with the inherent unity of the mind-body existence of humans. Consequently, the dualistic paradigm of mind and life is challenged, giving rise to discussions on the life-mind continuity thesis, which endeavors to "make headway on one of the outstanding philosophical and scientific problems of our time the so-called explanatory gap between consciousness and nature" (Thompson, 2007; pp. ix-x). Currently, three distinctions can be identified (Godfrey – Smith, 1994; pp. 80-89): the weak continuity thesis posits that anything with a mind is alive, making life a necessary condition for the mind; the strong continuity thesis suggests that the mind is essentially life-like, with life being a sufficient and necessary condition for the mind; the methodological continuity thesis asserts that understanding the mind requires an understanding of its role in the entire life system, making an understanding of life a necessary condition for the understanding of the mind.

Humanity seems to possess a robust philosophy regarding the material and the mechanical aspects of matter (machinery). However, when it comes to the mind and living entities endowed with consciousness, there appears to be a lack of a firmly established philosophy. This gap becomes particularly pronounced in an era filled with concepts such as the metaverse, large language models, and artificial intelligence, where we find ourselves intellectually entangled with machines. As expressed by Davies (2019), "The huge gulf that separates physics and biology – the realm of atoms and molecules from that of living organisms – is unbridgeable without fundamentally new concepts." In light of this, Professor Hengwei Li from Zhejiang University has published the book titled "*The Biotic View of Mind and Issues of Posthuman Society*." This book, comprising an introduction and nine chapters, is categorized into three main topics based on its content. Part I (Chapters 1-4) delves into the biotic view of mind," focusing on autopoiesis, pragmatism and predictive processing. Part II (Chapters 5-8) explores intelligent technology and posthumanism, centering around artificial intelligence, cyborgs, and posthuman society. Part III (Chapter 9) engages in the dialogue between two cultures in cognitive science, discussing the potential for two cultural perspectives and "the biotic view of mind" to form a "third culture".

## A Strong Continuity Thesis: The Biotic View of Mind

At the top of the book, the author proposes a strong continuity thesis termed "The Biotic View of Mind," which advocates for an understanding and exploration of the nature, functions, and interrelations of the mind from the perspective of life's continuity, well-being, adaptation, and evolution (p. 1). This view represents a theoretical framework that underscores the intrinsic connection between the mind and the broader context of life. By adopting this perspective, the author seeks to provide insights into the fundamental nature of the mind and the intricate relationships among its various functions.

Life requires a clear definition. Throughout history, the criteria for what constitutes life and the standards for determining whether something is living or non-living have been ambiguous. The scientific community has consistently anticipated the emergence of more general explanatory theories rather than descriptive ones has been emphasized (Thompson, 2007). The theory of autopoiesis, which aligns with the contemporary biological emphasis on the individuality of life, represents an attempt in this direction. It takes the local ecological context as a figure and uses the individual life in its "here and now" as the starting point, signifying a process of self-production or self-making. The definition of autopoiesis has undergone evolution, currently simplified into three criteria (Thompson, 2007; p.101): a) the system must have a semipermeable boundary; b) the boundary must be produced by a network of reactions that takes place within the boundary; c) the network of reactions must include reactions that regenerate the components of the system. These criteria reflect an attempt to move beyond a mere descriptive understanding of life and offer a more encompassing and explanatory framework. The pursuit of a definitive definition for life remains an ongoing endeavor within the scientific community, with autopoiesis contributing valuable insights into the conceptualization of life.

The perspective of the biotic view of mind on the unity and cyclical nature of cognition and action aligns with the epistemological traditions of pragmatism: knowledge, in other words, representation or models, is instrumental. Representations (or concepts) are not inherently self-sufficient; their significance lies in the actual effects they produce through action in the service of life. To survive and adapt in an uncertain environment, the activities of life cannot remain solely at the cognitive stage or level of perceiving, representing, and manipulating representations. Instead, life must guide or direct action and ultimately respond to the real, material demands and challenges posed by the environment through embodied actions and material causality. Therefore, in serving the fundamental purpose of life—adapting to a broader range of stimuli and expanding the breadth of the ecological environment—organisms gradually evolve sensory-

motor loops. The sensory and motor aspects, cognition and action, become an inseparable and unified whole, responding to the realistic, material requirements and challenges posed by the environment. This integration occurs in service of life's overarching goal, emphasizing adaptation to a wider array of stimuli and the extension of the breadth of the ecological environment.

The Predictive Processing Theory has emerged as a dominant cognitive research paradigm in the past decade, intricately interwoven with the contemporary cognitive science shift towards "pragmatism" or "action orientation." The theory endeavors to encapsulate the diverse ways in which humans (or generally higher organisms) confront and solve various problems, adapting to their environment seamlessly and efficiently—essentially, intelligence—into a unified general mechanism. At its core, this mechanism employs a simple yet effective strategy: during the interaction between life and the environment, life continually predicts the upcoming situation based on its previously acquired model of "what things are in the environment, how to respond (or act) to them, and what sensations are experienced during this response (or action)." If the predicted situation aligns or matches the actual circumstances, the interaction between life and the environment proceeds smoothly. At this point, the environment responds to and satisfies the needs and requirements of life. However, if the predicted situation deviates from the actual circumstances, "prediction errors" are generated. To eliminate or minimize these prediction errors, "life must take action to alter some aspect of the overall situation or adjust its existing model, thereby eliminating prediction errors and reconstructing a smooth interaction with the environment" (p. 45). The comprehensive significance of predicting reality lies in the selection and control of appropriate actions to intervene in the world where life encounters challenges. From the biotic view of mind, at its most fundamental level, the entire processing system based on predictive modeling exists solely to assist life in achieving its goals of survival, well-being, prosperity, and adaptation through action.

### **Intelligent Technology and Post-Humanism Society**

The biotic view of mind, while inherently a philosophical proposition, necessitates a pragmatic discussion within the context of contemporary realities, particularly in the current technological era. Therefore, commencing from a posthumanism standpoint, the author sequentially examines the threats posed by artificial intelligence, the the artificial intelligence singularity theory, cyborgs, and the landscape of posthuman society.

The advancement of *Artificial Intelligence* (AI) unfolds as a dual-edged phenomenon, simultaneously holding the potential to benefit and threaten humanity. Consequently, the author systematically classifies potential AI threats into four semantic categories:

instrumental threat, adaptive threat, conceptual threat, and existential threat. In instrumental threat and adaptive threat, the subject is a human being in the biological sense, and AI exists as a tool or as a labor force that replaces humans. The subject in the conceptual threat is a biological human being fused with AI, but still essentially a biological human being, while the AI in the existential threat will become an independent and autonomous life form superior to human beings taking over all of the earth's resources from human beings, and may ultimately annihilate human beings. Drawing upon Jaak Panksepp's archaeology of mind, Hans Jonas's phenomenological analysis of metabolism, and Maturana and Varela's biological autopoiesis theory, the author constructs a comprehensive framework for understanding the origins and evolution of life. In fact, "the threat of AI that some people are truly worried and fearful of lacks a solid theoretical basis, and is caused by the expansion of anthropomorphization of AI" (p. 93).

AI Singularity Theory refers to a hypothetical point in the future where AI reaches a level of sophistication and capability that surpasses human intelligence across all domains. Proponents of this school of thought argue that after the singularity, generalized AI will become super-AI, surpassing humans and thus potentially jeopardizing human existence, while the author is critical of this. Starting from an analysis of the nature of life, the author develops two arguments by identifying the relationship between three sets of categories which are intelligence and mind, mind and life, and life and metabolism: mind is not equivalent to intelligence; and metabolism is not computationally realizable.

The concept of the Cyborg, a hybrid human form integrating organic and mechanical systems, reflects the intricate relationship between humanity, machinery, body, and mind. Tracing the historical and philosophical evolution of the cyborg, the authors delineate three versions based on the degree of human-machine integration. "Cyborg 1.0" symbolizes the pre-cyborg era, emphasizing external communication and control over machines. "Cyborg 2.0" emerges from the aerospace era, featuring closer physical attachment to the human body. Finally, "Cyborg 3.0" embodies the natural-born cyborg, with machines directly linked to the brain and nervous system, influencing human cognition and emotions.

Each societal form aligns with distinct cultural and ideological trends, leading to three technological cultural trends and their corresponding post-human societies. The anthropocentric trend results in the "Industry 4.0 society", characterized by human control of technology. The transhumanist trend manifests in "the cyborg society", marked by the fusion of human and technological elements. The technological determinism trend culminates in "the technological singularity society", where technology surpasses human capabilities. The trajectory of post-human societal development hinges on both the

inherent uncertainties of evolution and human technological culture, emphasizing the ethical choices humans make regarding the values attributed to technology.

### The Dialogue between Two Cultures in Cognitive Science

Seventy years ago C. P. Snow began his campaign against the "two cultures"—the divisive gap between traditional "literary intellectual" culture and the culture of the sciences (Snow, 1998), presented in **Table 1**. In lieu of this, he advocated for the emergence of a "third culture" that would draw upon and integrate the resources of disciplines spanning the natural and social sciences, the arts, and the humanities. In this book, the author, representing phenomenology and biology as exemplars of the "two cultures," reviews the schism between these two cultural domains and summarizes three approaches towards the realization of a third culture in contemporary cognitive science.

The first approach involves a unidirectional extension of scientific culture, characterized by the popularization and accessibility of scientific knowledge. This approach deviates from Snow's original intent and may deepen the gap between the two cultures rather than bridging it. The second approach advocates for the consilience of knowledge, aiming to understand human nature from the perspectives of neuroscience, psychology, and evolutionary biology. This approach seeks to integrate insights from multiple scientific disciplines to achieve a more comprehensive understanding of the complexities of human cognition. The third approach corresponds to the contemporary scientific trend known as the "neurological turn," emphasizing the development of neuro-X studies. This involves a focus on advancements in neuroscientific research, exploring the intricacies of neural processes and their implications for understanding various aspects of human cognition and behavior.

<b>Table 1. The difference between scientific culture and humanistic culture.</b>		
<b>Comparison term</b>	<b>Scientific culture</b>	<b>Humanistic culture</b>
Aims	Primarily focus on action understanding	Expand to include emotion and cognition
Objects	Objective, public physical things	The life of the mind of the subject
Perspectives	Third-person, objective observation	First-person immersion and reflection of the subject
Methods	Thinking and experimenting	Thinking and Imaging
Results	Knowledge of the object	Understanding of the existence of the subject

### Discussion

The biotic view of mind breaks with the standard dichotomy that habitually divides life and mind into two categories. It turns our

conversation into the discussion of biotic mind or minded life, providing an understanding of the mind from the standpoint of real-life activities. Furthermore, it bridges the life-mind continuity thesis with post-human societal issues, thereby proposing a solution for the third culture of cognitive science. These benefits are due to the fact that the proposition - the biotic view of mind, - has a reliable philosophical foundation and is integrable with numerous theories.

Firstly, we contend that the biotic view of mind can offer a naturalistic foundation for various concepts related to cognition. It posits that the essence of the mind is fundamentally a phenomenon of life or organic beings. To comprehensively understand the mind, a profound understanding of the nature of life is imperative. Life is essentially a self-sustaining system stemming from internal processes of self-production (metabolism), namely, a dynamic self-regulating homeostatic system. The activities of this system ultimately serve to maintain the integrity of its self-regulatory balance, representing the highest biological value. This highest biological value is also referred to as the natural teleonomy or intrinsic teleonomy of life. Only by adopting such a naturalistic stance can research on the mind transcend pre-modern notions of the soul and modern substance dualism intuitions. This naturalistic perspective is essential to establish a cohesive foundation for the scientific study of the mind and its place in nature. It enables a seamless transition between the phenomenology revealing human mentality and subjectivity, and the science revealing human biological nature and objectivity. This naturalistic stance fosters an ongoing dialogue and mutual complementarity between the humanities and the sciences, particularly within cognitive science. Ultimately, it paves the way for the compatibility of traditionally divided or even opposing cultures into a "third culture," allowing for a redefined understanding of human existence. "Science will open up new possibilities for human existence based on an understanding of human nature and the human mind" (p. 201).

Secondly, The Biotic View of Mind is perceived as a grand unifying concept. Second-generation cognitive science fundamentally constitutes a broad movement to understand the constitution, processes, and existence of the mind from the perspective of life's nature and activities. The specific and empirical revelations of life-mind deep continuity are manifested through the generative and predictive processing pathways of the mind. The Biotic View of Mind seamlessly integrates various ideological resources, including contemporary life theories, embodied mind, enactive cognition, predictive processing, and homeostatic principles. It contributes to discussions on post-humanistic issues arising from converging technologies such as artificial intelligence, life technologies, and cyborgs, as well as the diverse ethical considerations associated with these topics. This discourse can further extend to discussions on human enhancement technologies and ethics.

## Conclusion

"The Biotic View of Mind and Issues of Posthuman Society" is rich in content and offers a comprehensive perspective that aids in a better understanding of the nature of human being and the challenges facing our future society. It also encourages us to contemplate broader domains within cognitive science and make contributions to the development and progress of human society. We highly recommend this book to anyone interested in philosophy, cognitive science, artificial intelligence, and posthumanism - whether you're a scholar, researcher, or an everyday reader, you will undoubtedly benefit from it.

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## Conflict of interest statement

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