
Reasoning In Biological Discoveries Essays On Mech

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 Embodiment and Epigenesis: Theoretical and Methodological Issues in Understanding the Role of Biology within the Relational Developmental System

*Reasoning In Biological Discoveries
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EPSA15 Selected Papers Academic Press

Heredity: knowledge and power -- Generation, reproduction, evolution -- Heredity in separate domains -- First syntheses -- Heredity, race, and eugenics -- Disciplining heredity -- Heredity and molecular biology -- Gene technology, genomics, postgenomics: attempt at an outlook.

Contemporary Debates in Philosophy of Biology University of Pittsburgh Press

The study of science, sometimes referred to as metascience, is a new and growing field that includes the philosophy of science, history of science, sociology of science, and anthropology of science. In the last ten years, the formal study of the psychology of science has also emerged. The psychology of science focuses on the individual scientist, influenced by intelligence, motivation, personality, and the development of scientific interest, thought, ability, and achievement over a lifespan. Science can be defined

as explicitly and systematically testing hypotheses. Defined more broadly, science includes wider processes, such as theory construction and the hypothesis testing seen in children and "non-scientific" adults. Most prior work in the study of science has emphasized the role of explicit reasoning; however, contemporary research in psychology emphasizes the importance of implicit processes in decision-making and choice and assumes that the performance of many tasks involves a complex relationship between implicit and explicit processes. Psychology of Science brings together contributions from leaders in the emerging discipline of the psychology of science with other experts on the roles of implicit and explicit processes in thinking. Highlighting the role of implicit processes in the creation of scientific knowledge, this volume links the psychology of science to many strands of psychology, including cognitive, social, and developmental psychology, as well as neuroscience. Ultimately, this volume raises awareness of the psychology of science among psychologists, philosophers, and sociologists of science, and anyone interested in the metasciences.

Handbook of the Psychology of Science Springer

Patterns of explanation in biology have long been recognized as different from those deployed in other scientific disciplines, especially that of physics. Celebrating the diversity of interpretative models found in biology, this volume details their varying types as well as explaining their relationships to one another. It covers the key differentials with other sciences in the nature of explanation, such as the existence in biology of varieties unheard of in the physical sciences, such as teleological, evolutionary and even functional explanations. Offering a wealth of fresh analysis of the phenomenon, chapters examine aspects ranging from the role of mathematics in explaining cell development to the complexities thrown up by evolutionary-developmental biology, where explanation is altered by multidisciplinary itself. They cover major domains such as ecology and systems biology, as well as contemporary trends, such as the mechanistic explanations spawned by progress in molecular biology. With contributions from researchers of many different nationalities, the book provides a many-angled perspective on a revealing feature of the discipline of biology. Biological Robustness Cambridge Scholars Publishing

Epigenetics is currently one of the fastest-growing fields in the sciences. Epigenetic information not only controls DNA expression but links genetic factors with the environmental experiences that influence the traits and characteristics of an individual. What we eat, where we work, and how we live affects not only the activity of our genes but that of our offspring as well. This discovery has imposed a revolutionary theoretical shift on modern biology, especially on evolutionary theory. It has helped to uncover the developmental processes leading to cancer, obesity, schizophrenia, alcoholism, and aging, and to facilitate associated medical applications such as stem cell therapy and cloning. Above the Gene, Beyond Biology explores how biologists in this booming field investigate and explain living systems. Jan Baedke offers the first comprehensive philosophical discussion of epigenetic concepts, explanations, and methodologies so that we can better understand this “epigenetic turn” in the life sciences from a philosophical perspective.

A Cultural History of Heredity Springer

This is a book about an attempt to change the way math was taught in a particular classroom. Its title plays on our everyday usage of the terms theory and practice. In education, these terms are conventionally treated oppositionally—we have theories about what we should do and we have what teachers actually do do. In this way, theory stands prior, logically and chronologically, to practice; practice inevitably becoming theory’s imperfect realization. We seek in this volume, however, to develop a different stance with regard to the relationship between the two. Taking the details of instructional practice as our principle object of study, we explore what role theories of learning might play in illuminating such practices. The book is about actual practices by which teaching is done and how contemporary theories of learning might help us understand those practices. It seeks to provide a foundation for future practice-based inquiry in education, by addressing the methodological question: How do we go about studying instructional practice in a principled way? Explanatory Pluralism Oxford University Press

Philosophical Perspectives on the Engineering Approach in Biology provides a philosophical examination of what has been called the most powerful metaphor in biology: The machine metaphor. The chapters collected in this volume discuss the idea that living systems can be understood through the lens of engineering methods and machine metaphors from both historical, theoretical, and practical perspectives. In their contributions the authors examine questions about scientific explanation and methodology, the interrelationship between

science and engineering, and the impact that the use of engineering metaphors in science may have for bioethics and science communication, such as the worry that its wide application reinforces public misconceptions of the nature of new biotechnology and biological life. The book also contains an introduction that describes the rise of the machine analogy and the many ways in which it plays a central role in fundamental debates about e.g. design, adaptation, and reductionism in the philosophy of biology. The book will be useful as a core reading for professionals as well as graduate and undergraduate students in courses of philosophy of science and for life scientists taking courses in philosophy of science and bioethics.

Philosophical Perspectives on the Engineering Approach in Biology Springer Science & Business Media

This book addresses the problem of the transition to new forms of social order in the global world. As a haunting sense of historical discontinuity pervades Western societies, it offers a fresh perspective on the issue, focusing on two basic coordinates to pinpoint the developmental path of rapidly changing societies: one is the mechanism of unfettered social morphogenesis and the other is the specific kind of societal unification brought about by globalization, with the related closure of the world. The book draws on the theoretical work produced in the five volumes of the Springer series “Social Morphogenesis” and applies it in a sustained and concerted approach to the empirical examination of macro-social change. The first part of the book presents the social ontology of the morphogenetic approach, and discusses its capacity to interpret macrosocial transitions. The second part then draws a prospective outline of the social formation known as the ‘morphogenic society,’ showing how unbound morphogenesis in a globalized world shapes such crucial phenomena as social norms, war and violence, openness and closure as adaptive responses from social organizations. Lastly, the third part examines the anthropological consequences of these societal trends, focusing on self and character as well as on human fulfillment and the ‘good life’.

The Oxford Handbook of Philosophy of Political Science Oxford University Press

This book explores new findings on the long-neglected topic of theory construction and discovery, and challenges the orthodox, current division of scientific development into discrete stages: the stage of generation of new hypotheses; the stage of collection of relevant data; the stage of justification of possible theories; and the final stage of selection from among equally confirmed theories. The chapters, written by leading researchers, offer an interdisciplinary perspective on various aspects of the processes by which theories rationally should, and descriptively are, built. They address issues such as the role of problem-solving and heuristic reasoning in theory-building; how inferences and models shape the pursuit of scientific knowledge; the relation between problem-solving and scientific discovery; the relative values of the syntactic, semantic, and pragmatic view of theories in understanding theory construction; and the relation between ampliative inferences, heuristic reasoning, and models as a means for building new theories and knowledge. Through detailed arguments and examinations, the volume collectively challenges the orthodox view’s main tenets by characterizing the ways in which the different “stages” are logically, temporally, and psychologically intertwined. As a group, the chapters provide several attempts to answer long-standing questions about the possibility of a unified conceptual framework for building theories and formulating hypotheses.

Scientific Concepts and Investigative Practice University of Chicago Press

This Handbook combines coverage of traditional areas in the

philosophy of science, such as causation, explanation, and theory structure, with chapters on new areas such as philosophy of astronomy, data, complexity theory, and emergence. The articles are accessible to scientifically educated non-philosophers as well as to philosophers.

Interpretation Springer Publishing Company

This edited collection showcases some of the best recent research in the philosophy of science. It comprises of thematically arranged papers presented at the 5th conference of the European Philosophy of Science Association (EPSA15), covering a broad variety of topics within general philosophy of science, and philosophical issues pertaining to specific sciences. The collection will appeal to researchers with an interest in the philosophical underpinnings of their own discipline, and to philosophers who wish to study the latest work on the themes discussed.

The Routledge Companion to Philosophy of Science John Wiley & Sons

What kinds of knowledge do international relations theories seek? How do they search for it and claim to have found it? Lebow uses his answers to these questions to say something important about the theory project in IR, and in the social sciences more generally.

The Oxford Handbook of Philosophy of Science John Wiley & Sons

In *Explaining Cancer*, Anya Plutynski addresses a variety of philosophical questions that arise in the context of cancer science and medicine. She begins with the following concerns: · How do scientists classify cancer? Do these classifications reflect nature's "joints"? · How do cancer scientists identify and classify early stage cancers? · What does it mean to say that cancer is a "genetic" disease? What role do genes play in "mechanisms for" cancer? · What are the most important environmental causes of cancer, and how do epidemiologists investigate these causes? · How exactly has our evolutionary history made us vulnerable to cancer? *Explaining Cancer* uses these questions as an entrée into a family of philosophical debates. It uses case studies of scientific practice to reframe philosophical debates about natural classification in science and medicine, the problem of drawing the line between disease and health, mechanistic reasoning in science, pragmatics and evidence, the roles of models and modeling in science, and the nature of scientific explanation.

Effective Governance Designs of Food Safety Regulation in the EU Walter de Gruyter

Naturalism is currently the most vibrantly developing approach to philosophy, with naturalised methodologies being applied across all the philosophical disciplines. One of the areas naturalism has been focussing upon is the mind, traditionally viewed as a topic hard to reconcile with the naturalistic worldview. A number of questions have been pursued in this context. What is the place of the mind in the world? How should we study the mind as a natural phenomenon? What is the significance of cognitive science research for philosophical debates? In this book, philosophical questions about the mind are asked in the context of recent developments in cognitive science, evolutionary theory, psychology, and the project of naturalisation. Much of the focus is upon what we have learned by studying natural mental mechanisms as well as designing artificial ones. In the case of natural mental mechanisms, this includes consideration of such issues as the significance of deficits in these mechanisms for psychiatry. The significance of the evolutionary context for mental mechanisms as well as questions regarding rationality and wisdom is also explored. Mechanistic and functional models of the mind are used to throw new light on discussions regarding issues of explanation, reduction and the realisation of mental

phenomena. Finally, naturalistic approaches are used to look anew at such traditional philosophical issues as the correspondence of mind to world and presuppositions of scientific research.

The Routledge Handbook of Mechanisms and Mechanical Philosophy Cambridge University Press

This book argues that many mental states, including such conscious states as perceptual experiences and bodily sensations, are identical with brain states.

Regarding the Mind, Naturally Cambridge Scholars Publishing Originally published in 2006, the second edition of *The Design of Experiments in Neuroscience* continues to be an excellent and eminently readable guideline for students beginning their scientific careers. Although all of the examples are specific to neuroscience, this slender volume offers valuable illumination on core practices, principles, and experimental approaches pertinent for all new researchers. Chapter topics cover recognizing pseudoscience, ethics, how to critically read journal articles, how to pick an experimental question, basic research design, controlling variables, and tips for becoming an independent investigator. Each of the eight chapters provides descriptive figures and extra information boxes, questions to check reader comprehension, additional thought questions, further reading suggestions, and Web resources. The six appendixes are as valuable as the main text, including information on working with data, writing research papers, a sample paper, questions and exercises for review, a glossary, and answers to chapter questions. Neuroscientist Harrington (Smith College) has created a wonderful resource that should be a must read for every neuroscientist in training, if not all novice scientists. *Summing Up: Highly recommended. Upper-division undergraduates and graduate students. Upper-division Undergraduates; Graduate Students. Reviewed by C. L. Iwema.*

Theories of Learning and Studies of Instructional Practice Oxford University Press

Toward a Philosophical Approach to Psychiatry presents a collection of philosophical and historical papers authored by the psychiatrist Kenneth S. Kendler. Written primarily for psychiatrists, psychologists, and other scholars in the mental health professions, as a body of work, the papers offer an accessible distillation of many of the best current ideas from the philosophy of mind and the philosophy of science as applied to problems in psychiatric research and practice. The continuous thread running through these papers is a looking behind the common assumptions that nourish unrealistic expectations about what can be discovered about the nature of psychiatric disorders in the short-term--without abandoning a commitment to scientific progress in the long run. After a foreword by Robert Freedman, the book commences with Peter Zachar's intellectual biography of Kendler followed by Kendler's own introductions, providing an autobiographical and conceptual background for each paper. In addition to Kendler's own writings, this collection includes many important collaborative efforts, including papers with John Campbell, Carl Craver, Kenneth Schaffner, Erik Engstrom, Rodrigo Munoz, George Murphy, and Peter Zachar.

Discovering Complexity Springer

The book answers long-standing questions on scientific modeling and inference across multiple perspectives and disciplines, including logic, mathematics, physics and medicine. The different chapters cover a variety of issues, such as the role models play in scientific practice; the way science shapes our concept of models; ways of modeling the pursuit of scientific knowledge; the relationship between our concept of models and our concept of science. The book also discusses models and scientific explanations; models in the semantic view of theories; the

applicability of mathematical models to the real world and their effectiveness; the links between models and inferences; and models as a means for acquiring new knowledge. It analyzes different examples of models in physics, biology, mathematics and engineering. Written for researchers and graduate students, it provides a cross-disciplinary reference guide to the notion and the use of models and inferences in science.

The Quest for Knowledge in International Relations Oxford University Press

The Oxford Handbook of Philosophy of Political Science contains twenty-seven freshly written chapters to give the reader a panoramic introduction to philosophical issues in the practice of political science. Simultaneously, it advances the field of Philosophy of Political Science by creating a fruitful meeting place where both philosophers and practicing political scientists contribute and discuss. These philosophical discussions are close to and informed by actual developments in political science, making philosophy of science continuous with the sciences, another aspiration that motivates this volume. The chapters fall under four headings: (1) evaluating theoretical frameworks in political science; (2) methodological challenges and reconciliations; (3) the purposes and uses of political science; and, (4) the interactions between political science and society. Specific topics discussed include the biology of political attitudes, intra-agent mechanisms, rational choice explanations, theories of collective action, explaining institutional change, conceptualizing and measuring democracy, process tracing, qualitative comparative analysis, interpretivism and positivism, mixed methods, within-cause causal inference, evidential pluralism, lab and field experiments, external validity, contextualization, prediction, expertise, clientelism, feminism, values, and progress in political science.

Explaining Cancer MIT Press

There is a need for integrated thinking about causality, probability and mechanisms in scientific methodology. Causality and probability are long-established central concepts in the sciences, with a corresponding philosophical literature examining their problems. On the other hand, the philosophical literature examining mechanisms is not long-established, and there is no clear idea of how mechanisms relate to causality and probability. But we need some idea if we are to understand causal inference in the sciences: a panoply of disciplines, ranging from epidemiology to biology, from econometrics to physics, routinely

make use of probability, statistics, theory and mechanisms to infer causal relationships. These disciplines have developed very different methods, where causality and probability often seem to have different understandings, and where the mechanisms involved often look very different. This variegated situation raises the question of whether the different sciences are really using different concepts, or whether progress in understanding the tools of causal inference in some sciences can lead to progress in other sciences. The book tackles these questions as well as others concerning the use of causality in the sciences.

Building Theories Routledge

How is medical knowledge made? New methods for research and clinical care have reshaped the practices of medical knowledge production over the last forty years. Consensus conferences, evidence-based medicine, translational medicine, and narrative medicine are among the most prominent new methods. *Making Medical Knowledge* explores their origins and aims, their epistemic strengths, and their epistemic weaknesses. Miriam Solomon argues that the familiar dichotomy between the art and the science of medicine is not adequate for understanding this plurality of methods. The book begins by tracing the development of medical consensus conferences, from their beginning at the United States' National Institutes of Health in 1977, to their widespread adoption in national and international contexts. It discusses consensus conferences as social epistemic institutions designed to embody democracy and achieve objectivity. Evidence-based medicine, which developed next, ranks expert consensus at the bottom of the evidence hierarchy, thus challenging the authority of consensus conferences. Evidence-based medicine has transformed both medical research and clinical medicine in many positive ways, but it has also been accused of creating an intellectual hegemony that has marginalized crucial stages of scientific research, particularly scientific discovery. Translational medicine is understood as a response to the shortfalls of both consensus conferences and evidence-based medicine. Narrative medicine is the most prominent recent development in the medical humanities. Its central claim is that attention to narrative is essential for patient care. Solomon argues that the differences between narrative medicine and the other methods have been exaggerated, and offers a pluralistic account of how the all the methods interact and sometimes conflict. The result is both practical and theoretical suggestions for how to improve medical knowledge and understand medical controversies.