

MINDING THE BRAIN

MODELS OF THE MIND, INFORMATION,
AND EMPIRICAL SCIENCE

EDITED BY
ANGUS J. MENUGE, BRIAN R. KROUSE,
AND ROBERT J. MARKS

Description

Is your mind the same thing as your brain, or are there aspects of mind beyond the brain's biology? This is the mind-body problem, and it has captivated curious minds since the dawn of human contemplation. Today many insist that the mind is completely reducible to the brain. But is that claim justified? In this stimulating anthology, twenty-five philosophers and scientists offer fresh insights into the mind-brain debate, drawing on psychology, neurology, philosophy, computer science, and neurosurgery. Their provocative conclusion? The mind is indeed more than the brain.

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ADVANCE PRAISE

The mind-body problem lives! A stimulating collection of contemporary perspectives on a perennial conundrum.

—**Gregory Chaitin**, algorithmic information theory pioneer; author,
Building the World from Information & Computation

Materialism about the mind is a deeply entrenched assumption, so much so that alternative viewpoints are shrugged aside as inconsequential. *Minding the Brain* challenges that mindset, but not by giving a single, knock-down refutation of materialism or a single, obviously superior alternative. Instead, it presents a kaleidoscopic array involving multiple objections and multiple alternatives, authored by highly competent thinkers from neuroscience, consciousness studies, computer science, information theory, and philosophy. Both materialists and anti-materialists who want to understand the mind should not miss this book.

—**William Hasker**, Emeritus Professor of Philosophy, Huntington University

Minding the Brain is an imposing assemblage of cutting-edge criticisms of materialist views of the mind while advancing compelling alternative accounts of consciousness. The chapters on information, computation, and quantum theory are groundbreaking, advancing serious unacknowledged problems for materialism that must be contended with.

—**Brandon Rickabaugh**, Assistant Professor of Philosophy, Palm Beach
Atlantic University; Franz Brentano Fellow in the Metaphysics of Mind,
The Martin Institute

Written by renowned experts in different fields of science and philosophy, *Minding the Brain* provides a thorough, multifaceted, and insightful analysis of the age-old mind-body problem. It is well known that even an apparently simple inanimate entity like a sandpile may present a complex, non-linear, and chaotic dynamic which cannot be predicted by the individual properties of its constituting elements. With a unique common thread, the essays in this

anthology elegantly expose reductionism for what it truly is, a simplistic endeavor grounded on the scientific materialism creed which, on the topic of the mind-body problem, tries to explain all the complexity of higher-order cognitive phenomena exclusively through reference to the most basic physico-chemical interactions within its underlying biological strata. Such a myopic and simplistic naturalistic approach is not only intellectually disappointing but also inherently flawed, ultimately falling short of the awe-inspiring grandeur of the life of the mind as we all know and experience it. Try explaining the totality of the delightful experience of reading this academic masterpiece through a mathematical equation!

—**Tobias A. Mattei**, MD, FACS, Assistant Professor of Neurosurgery,
St. Louis University School of Medicine

Minding the Brain is an important book on substance dualism that comes with breadth, depth, and insight. It incorporates a number of fields of study and academic disciplines; it is up-to-date and rigorous in its presentation and argument; and it is fresh, thoughtful, and thought-provoking. I am pleased to see this robust defense of substance dualism that pushes back against the dominant view of naturalism in the academy as well as alternative views that likewise attempt to avoid the explanatory power of substance dualism and its important implications.

—**Paul Copan**, Pledger Family Chair of Philosophy and Ethics, Palm Beach Atlantic University; coeditor, *The Naturalness of Belief: New Essays on Theism's Rationality*

Minding the Brain is a very up-to-date anthology on the body-mind problem. The editors have assembled a team of excellent scholars from philosophy, neuroscience, psychology, computer science, quantum physics, and mathematics. Together they provide a very strong, cross-disciplinary, and cumulative argument for the need of non-material explanations of human characteristics such as consciousness, will, feelings, and creativity. A recurrent theme of several chapters is the importance of information as a mediator between the non-material and material. The book is a must-read for anyone who wants to understand why purely physical accounts of the mind have failed, and that alternative dualistic or idealistic theories are more credible than ever. I'm sure *Minding the Brain* will simulate many interesting discussions and much further research.

—**Ola Hössjer**, Professor of Mathematical Statistics, Stockholm University

Minding the Brain is an intriguing and comprehensive anthology. This thought-provoking collection delves into the realms of philosophy of mind, neuroscience, psychology, and the intersections of information, computation, and quantum theory. The book presents a

diverse range of perspectives and arguments, providing readers with a rich exploration of the mind-body problem and the nature of consciousness.

The book begins with an introductory chapter by the editors, setting the stage for the subsequent discussions. Angus J. L. Menuge's chapter on declining physicalism and resurgent alternatives offers a compelling examination of philosophical viewpoints surrounding the mind. J. P. Moreland's contribution on neuroscience and the metaphysics of consciousness and the soul raises intriguing questions about the nature of consciousness and its relationship to the brain.

One of the highlights of this book is the section dedicated to the philosophy of mind, where different perspectives such as substance dualism, idealism, and physicalism are thoroughly explored. Stewart Goetz and Charles Taliaferro present a robust defense of substance dualism, while Douglas Axe offers a commonsensical defense of idealism. These chapters provide readers with a deep understanding of the philosophical underpinnings of different theories of mind.

The exploration of neuroscience and psychology in the anthology is equally engaging. Michael Egnor's chapter on neuroscience and dualism challenges the prevailing materialistic view, while Cristi L. S. Cooper's discussion on free will and the limitations of Libet experiments offers a fresh perspective on agency and determinism. Joseph Green's chapter on the limitations of cutting-edge neuroscience prompts readers to critically examine the current state of the field.

The book also studies the fascinating relationship between information, computation, and quantum theory. Bruce L. Gordon's chapter on consciousness and quantum information offers intriguing insights into the potential role of quantum processes in understanding consciousness. Additionally, Winston Ewert's discussion on the human mind's sophisticated algorithm presents a compelling argument about the nature of human creativity and its computational basis.

Overall, *Minding the Brain* is an excellent compilation of diverse perspectives on the mind-body problem. The book covers a wide range of topics and offers deep insights into the crossroads of philosophy, neuroscience, psychology, and quantum theory. Readers with an interest in the nature of consciousness, the mind-brain relationship, and the limits of empirical science will find this book to be a valuable resource. The contributors present rigorous arguments and engage in thought-provoking discussions, making this book a must-read for those seeking a deeper understanding of the complexities of the mind and human-level intelligence.

—**Lipo Wang**, Associate Professor of the School of Electrical and Electronic Engineering, Nanyang Technological University, Singapore

Minding the Brain is a fascinating look at the relationship between conscious experience and the three-pound mass of neurons resting in one's skull. Scholars from different fields address the challenge of understanding the immaterial mind using a materialist framework, and they make the case that a multidisciplinary approach is required to unravel this enigma. What follows is a tour de force of philosophy, neuroscience, and computer science that presents non-materialist solutions to the mind-brain problem. Anyone who has wondered if people are more than a pile of atoms should read this book.

—**Andrew Knox**, MD, MS, Assistant Professor of Neurology,
University of Wisconsin School of Medicine and Public Health

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1. INTRODUCTION

Angus J. L. Menuge, Brian R. Krouse, and Robert J. Marks

IS YOUR MIND THE SAME THING AS YOUR brain? Or are there aspects of mind that are external to the biology of the brain? This question, referred to as the mind-body problem or the mind-brain problem, has been debated for centuries and has captivated curious minds since the dawn of human contemplation. What is the relationship between our mental life and physical body? Intuition suggests our subjective experience of the world is tightly bound up with our physical bodies. Exactly what kind of beings are we, with both a personal mental life and a corporeal nature, somehow all wrapped up in one?

Fresh insights into the mind-brain debate are the subject of this anthology. Analysis is presented from a spectrum of expertise including psychology, neurology, philosophy, computer science, and neurosurgery. Although there are differences in details, all agree there is evidence that the mind is, indeed, more than the brain.

In our modern age, full of science and technology, physical existence often appears to be the most substantial and “real” aspect of the world. After all, the technology that permeates our lives has been made possible by humanity’s progress in understanding and manipulating the material world, including our own bodies (and brains). In light of these technological wonders, it may seem plausible to assume that physical

existence constitutes the most fundamental layer of reality, and everything else, including our mental lives, is built upon that foundation.

Yet we often take our mental lives for granted. Upon reflection, however, we recognize they possess unique characteristics that do not align well with a materialist framework. These include the inherent subjectivity of our sensory experiences (i.e., pain cannot be ownerless—it must belong to someone), our ability to employ abstract logic and mathematics to explain the workings of the natural world, our capacity to envision a future state and then actualize it in reality, and—perhaps the most distinctive feature—the sense of being a consistent entity, an “I” that persists over time, at the center of our mental activities. It is challenging to comprehend how an arrangement of impersonal matter could give rise to an agent with these distinctively mental attributes.

Delving deeper, we realize that these facets of our mental life are actually more immediate and tangible to us than the external world. Our perception of the world is entirely mediated through our senses. Moreover, the practice of science itself is reliant on our mental capability to employ abstract logic and mathematics. Similarly, the engineering of technology hinges on our mental ability to design solutions to

problems and manifest those solutions in the physical world.

Considering that our mental lives possess attributes that are not evidently rooted in physicality, and in fact hold a more immediate place in our lives than the physical world, could it be that our initial assumption—that the physical world is the most fundamental or the most “real” aspect of existence—is incorrect?

Nevertheless, our bodies certainly seem to belong to the physical world. This raises the question: how can we be both mental agents and possess a physical body that occupies time and space? How can two such vastly distinct aspects coexist within a single entity?

Overview

THIS ANTHOLOGY brings together twenty-three scholars and twenty-five chapters (three of the chapters online only) to explore the mind-body (or mind-brain) problem from diverse perspectives. The target audience of this anthology is academic but multi-disciplinary. Both philosophy and various scientific fields have a lot to contribute to this topic. Unfortunately, technical jargon often creates a barrier to understanding for those outside a specific field. For instance, many neuroscientists may struggle to comprehend a contemporary philosophy of mind journal, and the reverse is also true. In order to reach a broad academic audience, the authors featured in this anthology strive to present cutting-edge philosophical and scientific ideas in an accessible manner. Ideally, by minimizing jargon and providing clear definitions for key terms, the chapters can be understood by non-specialists in the respective fields, enabling valuable interdisciplinary dialogue on this fascinating topic.

The organization of this volume loosely groups chapters written by philosophers in the first two units and those penned by scientists in the last two. Generally speaking,

the editors have observed that philosophers tend to tread lightly when discussing scientific matters, while scientists often show the same caution regarding philosophical matters. This is perhaps not surprising, given the extensive scholarship involved in each field and the necessity for academics to specialize in order to develop depth and rigor. However, the editors firmly believe that robust engagement with the topic at hand requires a fusion of astute philosophical thinking and meticulous empirical analysis. In line with this belief, the editors have strongly encouraged the contributing philosophers to consider how their work might be constrained by recent scientific findings, or motivate certain scientific practices or hypotheses. Similarly, they have urged the scientists to reflect on the philosophical presuppositions and implications of their research.

The diversity of viewpoints in the philosophy of mind is vast, necessitating a focused approach in a volume like this—especially when considering the interplay of scientific findings with philosophical perspectives. This volume specifically develops a certain subset of non-materialist philosophical frameworks for reasons that are succinctly summarized below and elaborated in detail in Unit 1. In short, our philosophical exploration (in Unit 2) prioritizes several forms of dualism and idealism.

Units 3 and 4 invite authors to discuss scientific findings from various disciplines relevant to the mind-body debate. Unit 3 includes chapters on neuroscience, psychology, social psychology, and near-death experiences. Unit 4 groups chapters on information theory, quantum theory, computer science, and mathematics.

The intent of this volume is not to advocate for a particular approach to the mind-body problem across all of these academic disciplines. Indeed, the featured authors do not all concur on all points, and neither the editors nor the

publisher endorse every aspect of every chapter. Rather, the objective is to aggregate and showcase a broad spectrum of non-materialist perspectives and insights on the mind-body issue, drawing from a range of disciplines, both philosophical and scientific. The editors hope that these diverse contributions will inspire future interdisciplinary scholarship in a similar spirit.

Unit 1: Background

EXPLORATIONS OF the mind-body problem are inevitably situated within a metaphysical framework, and these typically posit the fundamental substances or types of “stuff” that exist in reality. As one might imagine, analyzing the mind-body problem within a specific metaphysical framework requires careful philosophical examination, often involving technical concepts and arguments. This type of work is best suited for academic philosophers, who are equipped with the necessary expertise and training to engage with these intricate issues. Accordingly, the first two units of this anthology feature chapters written by these philosophers.

As mentioned above, this anthology specifically emphasizes a diverse array of non-materialist approaches to the mind-body problem. In Unit 1, three chapters are dedicated to justifying the volume’s focus on these non-materialist frameworks.

In Chapter 2, entitled “Declining Physicalism and Resurgent Alternatives,” Angus Menuge traces the historical trajectory of physicalism in the philosophy of mind. Over the last century, the prevailing approaches to the mind-body problem have been grounded in materialist metaphysics, which asserts that matter (or more accurately matter-energy) is the sole fundamental type of substance in existence. Menuge recounts the numerous theories which have endeavored to explain the emergence of mental phenomena from impersonal matter,

with each successive theory aiming to rectify the limitations or pitfalls of its predecessors.

Despite the persistent dominance of materialist metaphysics in academia, some scholars contend that attempts to account for mental phenomena in purely physical terms over the past century have largely been unsuccessful. Moreover, the recurring pattern of shortcomings in these approaches suggests a potential fundamental problem with materialist metaphysics itself. This circumstance has sparked renewed interest in investigating non-materialist solutions to the mind-body problem, such as dualism or idealism, many of which trace their roots to ancient philosophies. These frameworks have been adapted and refined to address modern critiques, resulting in a vibrant exploration of non-materialist viewpoints on the mind-body problem.

In Chapter 3, “Neuroscience and the Metaphysics of Consciousness and the Soul,” James (more often “J. P.”) Moreland sheds additional light on the historical developments observed by Menuge by arguing that materialist metaphysics cannot be an adequate foundation for the mind in principle, whereas some form of substance dualism is not only up to the task but can interact productively with the empirical sciences by generating testable research programs—even though Moreland argues that neuroscience will always underdetermine the metaphysics.

In Chapter 4, “Methodological Naturalism and the Mind,” Robert Larmer addresses a prevalent concern about the constraints of scientific inquiry. Larmer scrutinizes the common notion that science must strictly adhere to methodological naturalism, an approach committed to explaining all events solely through physical causes. He contends that this presupposition is unwarranted and can hinder the fair evaluation of effective theories. By restricting

science to physical explanations, methodological naturalism may obstruct the investigation of non-physical causes (such as mental or rational factors) that could be operative in the world. Consequently, this approach could risk constraining science's ability to fully comprehend the authentic nature of various phenomena.

Unit 2: Philosophy of Mind: Dualism, Idealism, and Physicalism

THE FIRST four chapters in Unit 2 offer an introduction to several important non-materialist philosophical models that address the mind-body problem. These chapters are designed to familiarize readers with various schools of thought, assuming minimal prior knowledge. For further exploration, each author has written comprehensive book-length treatments of their respective subjects, which are referenced in the endnotes of each chapter.

In Chapter 5, “Substance Dualism,” Stewart Goetz and Charles Taliaferro present a concise survey of the history of thought on the human soul as a distinct substance, spanning Plato, Augustine, and Descartes. The authors then contrast substance dualism with property dualism, of which Aristotle was arguably one of the earliest proponents, which denies a substantial soul in favor of a dualism of mental and physical properties within a fundamentally material human being.

While the problem of causal interaction between body and soul can motivate some philosophers to prefer the latter, the authors argue that property dualism does not in fact escape the challenge of considering how our mental and physical aspects (whether properties or substances) are causally related. Finally, the authors consider the Libet experiments (which are also the subject of Chapter 14), and how these empirical results relate to the consideration of substance and property dualism.

In Chapter 6, “Mere Hylomorphism and Neuroscience,” James Madden unpacks the essential concepts in the holistic system that is hylomorphism. Like substance dualism, the Aristotelian doctrine of hylomorphism also has its roots in antiquity. Madden explains that hylomorphism is not primarily formulated to address the mind-brain problem but is rather a distinct philosophy of nature which can be fruitfully applied to the mind-brain problem. On hylomorphism, humans (as well as plants and animals) have “souls”—but this term is not used to refer to a spiritual substance, as in substance dualism. Rather, using terminology that can be easily misunderstood by modern ears, hylomorphism views substantial entities as a composite of “soul” and “matter.”

By “soul” is meant the “form”—a term that refers, rather abstractly, to that which, when combined with matter, makes a substantial entity (e.g., a living organism) the thing that it is, rather than something else. The soul is the “principle of actuality” that, when combined with “matter” makes the substantial entity what it is. “Matter,” here, is not meant to refer to material “stuff,” but instead is the “principle of potentiality”—that which has the potential to be a particular substantial entity, when combined with the right form.

While all living things have a soul in this sense, the souls of plants, animals, and humans have different capabilities. Madden explains how, on the view of hylomorphism, the distinctly human capability to think about and grasp universal truths implies that the human soul is “uniquely separable from matter”—putting hylomorphism in a category that is clearly distinct from materialism. Madden then proceeds to explore how a non-materialist, non-dualist conception of the mind and the brain is situated within this framework. Madden concludes that hylomorphism and neuroscience can work together in partnership towards the

holistic objective of “the full actualization of *human-being*.”

Douglas Axe introduces us to the concept of idealism in Chapter 7, “Of Thinkers, Thoughts, and Things: A Commonsensical Defense of Idealism.” Axe approaches idealism, which is typically associated with the philosopher George Berkeley, both from a commonsense perspective and with modern scientific content that directly challenges physicalism. Axe structures his presentation around the ideas of “Thinkers, Thoughts, and Things,” examining the nature of each through introspection and compelling, yet highly accessible argumentation. Ultimately, Axe concludes that Berkeleyan idealism provides a metaphysical framework that not only addresses the mind-body problem and aligns with the Christian Scriptures, but also solves deep challenges posed by modern physics that neither physicalism nor dualism can resolve.

In Chapter 8, “Mind over Matter: Idealism Ascendant,” Bruce Gordon also defends what he terms neo-Berkeleyan ontological idealism. Gordon’s analysis of the subject takes a detailed and philosophically sophisticated approach. After introducing his proposed framework, Gordon summarizes and critiques the dominant physicalist and dualist alternatives. He examines eliminativist, reductivist, and non-reductivist varieties of physicalism, finding problems with each.

He then considers property dualism, substance dualism, and hylomorphism, and although he finds flaws in each of these positions, substance dualism fares the best in his view. In the end, Gordon, like Axe, concludes that neo-Berkeleyan idealism is preferable because it avoids the philosophical challenges that other frameworks face and has superior explanatory power in accounting for some of the more puzzling aspects of modern physics.

The final four chapters in Unit 2 are chosen to enhance the reader’s immersion in the

field of philosophy of mind. Delving into distinct topics, these chapters uncover additional challenges for a physicalist account of the mind and simultaneously bolster the case for one or more of the non-materialist options.

In Chapter 9, “The Simple Theory of Personal Identity and the Life Scientific,” Jonathan Loose explains how the very act of engaging in the scientific process has implications for the mind-brain problem. To conduct scientific observation and reasoning, a person must not only have a unified consciousness at any given moment in time but also endure over time with a persistent personal identity. Loose examines why the fact of our unified field of consciousness, which is immediately manifest to all of us upon introspection, is difficult to accommodate on the view of physicalism, and instead points to substance dualism. Further, he demonstrates that the kind of observation and the type of reasoning that scientists routinely employ relies upon the unified conscious field that humans experience.

Addressing the subject of personal identity over time, Loose compares the robustness of the simple view, which aligns with substance dualism, to the challenges faced by the complex view. The complex view, grounded in materialism, relies on psychological and physical continuity, and ultimately falls short in accounting for personal identity. As he showed regarding the unified conscious field, Loose shows that the observational and rational processes employed by a scientist rely on the persistence of personal identity over time. Loose concludes that, given an esteem for science, one should prefer substance dualism over materialism.

Mihretu Guta explores the concept of mirror neurons in Chapter 10, “Mirror Neurons, Consciousness, and the Bearer Question.” Guta clarifies that mirror neurons, a category of brain cells, are considered by some neuroscientists to play a crucial role in reflecting another person’s

mental state. These neurons activate when an individual observes someone else engaging in goal-oriented actions. Guta notes that while mirror neuron theory has received considerable positive attention, it also has its critics. However, Guta observes that this scientific criticism has missed a prior and more basic metaphysical issue: whether the functional properties attributed to mirror neurons require acknowledgment of an irreducible consciousness and its bearer (i.e., the self or person). Guta conducts a detailed analysis of this metaphysical issue, and in so doing exhibits how important it is to apply careful metaphysical reasoning in order to draw valid neuroscientific conclusions.

Guta pursues a more purely philosophical kind of project in Chapter 11, “In What Sense is Consciousness a Property?” Guta considers how the metaphysics of properties, which has been an important and controversial issue in philosophy since antiquity, might be applied to the topic of mental properties. In particular, Guta asks how consciousness might be considered a property. After surveying the major schools of thought on properties, Guta notes that consciousness, with its irreducibly subjective nature, is difficult to locate within any of the traditional theories. Motivated by this challenge, Guta proposes and discusses what he calls the bearer-dependent model of consciousness. Guta concludes that given his bearer-dependent model, the most promising framework to make sense of consciousness as a property is one that takes a realist conception of properties, and makes an ontological distinction between physical and non-physical substance.

In Chapter 12, titled “Subject Unity and Subject Consciousness,” Joshua Farris delves into the nature of the unity observed in our conscious experience and its implications for the mind-body problem. Farris initially criticizes various physicalist and non-reductive

physicalist theories of the mind, demonstrating their inadequacy in explaining the special kind of unity present in our phenomenal consciousness. He then examines several specific substance dualist models, or “obscure dualisms,” recently proposed by contemporary philosophers, and reveals their inability to account for the self’s transparency. Ultimately, Farris argues that a neo-Cartesian form of substance dualism best explains the phenomenal unity of consciousness.

Unit 3: Neuroscience and Psychology

WHILE PHILOSOPHY is foundational when addressing the mind-body problem, many fields of modern science are also implicated in this discussion. Neuroscience has made it abundantly clear that there is a close connection between our brain’s physical functioning and our mental capabilities. Psychology, which focuses on mental well-being, is also closely linked to the mind-body problem. Unit 3 features contributions from neuroscience and psychology scholars who consider the relationship between the scientific findings of their field and the nature of the mind and brain. Additionally, a noted theologian and philosopher compiles and examines the evidential case for near-death experiences in the unit’s final chapter.

In Chapter 13, “Neuroscience and Dualism,” Michael Egnor begins by examining the materialist philosophical preferences prevalent in twentieth-century neuroscience, and provides an overview of idealist and dualist views of the mind. Egnor then proposes an approach for empirically testing these metaphysical frameworks. Within this context, Egnor evaluates several prominent neuroscience experiments, such as Roger Sperry’s research on split-brain patients, Wilder Penfield’s cortical stimulation experiments, and Benjamin Libet’s

study of brain activity before decision-making. Ultimately, Egnor concludes that materialism struggles to explain crucial empirical findings, while both idealism and dualism are more consistent with the scientific evidence. In particular, Egnor favors Thomistic dualism (i.e., hylomorphism) as the most suitable metaphysical framework for neuroscience.

In Chapter 14, titled “Free Will, Free Won’t, and What the Libet Experiments Don’t Tell Us,” Cristi Cooper delves into the Benjamin Libet experiments (briefly discussed earlier in the volume by Goetz and Taliaferro, and in the previous chapter by Egnor). Published in 1983, the Libet experiments continue to captivate those interested in neuroscience and free will. These experiments studied a spike of neural activity, known as the readiness potential, that occurred just before human subjects decided to press a button. Many people, particularly in popular science coverage, interpreted the results as evidence against free will, arguing that the readiness potential indicates our brains “decide” before we consciously do. However, it is less well known that Libet himself interpreted his results differently, and that many scientists have further investigated the readiness potential since 1983.

After summarizing several key studies published on this topic in the intervening years, Cooper contends that the popular interpretation of the readiness potential as a clear refutation of free will is actually weakened by subsequent research. Cooper concludes with a cautionary message for scientists (and their popular interpreters) not to overextend the implications of the research. Finally, Cooper encourages future researchers to investigate the neuroscience of free will, as it remains an open question.

Joseph Green offers a broad perspective on neuroscience and the mind-body problem in Chapter 15, “On the Limitations of

Cutting-Edge Neuroscience.” He observes that rapid advancements in neuroscience, amplified by popular media coverage, have fostered heightened expectations about our current understanding of the brain and our capacity to manipulate it using engineering techniques. Green evaluates the state of the field, celebrating areas of remarkable technological progress while also highlighting current limitations within neuroscience, particularly regarding our limited understanding of neural circuit dynamics. He then explores how the philosophy of mind could guide neuroscientists, and in turn, how neuroscience might help inform philosophers. In conclusion, Green advocates for a more philosophically cautious approach for neuroscientists, promoting humility and an overall agnosticism since current neuroscience itself warrants no specific metaphysical stance.

In Chapter 16, “Revising Our Pictures of Emotions,” Natalia Dashan and David Gelernter explore the nature of human emotions through the lens of affective psychology. They investigate the significance of feelings and emotions in human cognition, aspects that have often been overlooked by artificial intelligence researchers and computationalists since Alan Turing’s time. By analyzing several fictional case studies, Dashan and Gelernter demonstrate the central role our conception of emotions plays, affecting our emotional experiences and responses and thereby influencing our sense of reality and fundamental behavioral patterns. They examine various mental metaphors that people live by, some more accurate than others. Ultimately, Dashan and Gelernter leave readers with an appreciation for how these frames for understanding emotions serve as lenses through which we perceive and experience reality.

In Chapter 17, “A Case for the Relational Person,” Eric Jones examines two opposing perspectives on the concept of personhood in

social psychology, the atomistic/egoistic view and the relational view. The former views the person as determined, atomistic, and explicable in terms of the propagation of genetic material. The relational view highlights the fundamental dependency of individuals on their relationship with others, in the course of human development and in the context of what makes for a fulfilling life.

Upon reviewing relevant social psychology research, Jones concludes that the atomistic view does not adequately explain the data, while the relational view is broadly supported by the evidence. Due to the shortcomings of the atomistic model, Jones explores the role of metaphysics, suggesting that a materialistic metaphysical framework may limit social psychologists to the less effective atomistic/egoistic model. In contrast, a non-materialist metaphysical framework can provide the necessary ontological resources to support the more successful relational model. Jones ultimately posits that the findings of social psychology might warrant a preference for a non-materialist metaphysics of personhood.

In Chapter 18, titled “Evidential Near-Death Experiences,” Gary Habermas explores the evidential support for and potential implications of such experiences. He begins by distinguishing between near-death experiences (NDEs) that provide captivating narratives but lack verifiable elements, and those that involve “corroborated veridical recollections.” Habermas assembles and categorizes a substantial number of NDEs that feature corroborated observations made by individuals during their NDEs, which would have been impossible to perceive from their physical location using their ordinary senses. He then criticizes various explanations for this data from both naturalist and non-naturalist perspectives, such as those involving extra-sensory perception.

In conclusion, Habermas argues that the considerable number of high-quality evidential NDE cases gathered offers a persuasive case for interpreting these reports as genuine, veridical experiences of the individuals involved. As such, these NDEs appear to have metaphysical implications, indicating that people’s souls or minds might be separable from their physical bodies, while amazingly retaining some ability to perceive “sensory” information (e.g., take in visual perceptions as if they were using their eyes, which they are not) and even move about in space.

Unit 4: Information, Computation, and Quantum Theory

SINCE CLAUDE SHANNON pioneered the field of information theory and Alan Turing developed a comprehensive theory of computation, numerous scholars have utilized these theories to decipher the nature of the mind and brain. Among physicalists, this approach led to views such as functionalism and the computational perspective of the mind. However, as Angus Menuge shows in his previously mentioned Chapter 2, these views fall short of providing a convincing description of the mind.

Nevertheless, these disciplines do offer potent tools to enhance our understanding of the human mind, especially when combined with a metaphysical framework that isn’t restricted to reducing the mind to merely organic computation, as physicalism must. Unit 4 compiles several chapters that leverage insights from information theory, computer science, quantum theory, and mathematics to interrogate the mind-body problem.

In Chapter 19, “Information and the Mind-Body Problem,” Angus Menuge investigates the idea that information, given its dual existence in both abstract and concrete forms, could serve as an effective means of clarifying the dualist

interaction between mind and body. Menuge acknowledges that while physicalism struggles to account for core aspects of the mind, such as subjective consciousness and intentionality, dualism also encounters a significant hurdle in explaining mind-body interaction.

He uses these criticisms as a springboard for his project to provide a non-physicalist explanation of mind-body interaction. Drawing upon the inherent properties of information, Menuge introduces the Command Model of Action (CMA), a model designed to explain how non-physical mental intentions can cause physical effects, and the Signal Model of Sensation (SMS), a model that describes how nerve signals can lead to subjective experiences. Menuge concludes by exploring how the CMA and SMS models could interact with various non-materialist philosophies of mind, and how these models might inform scientific research.

Bruce Gordon delves deep into the intersection of quantum theory and idealism in Chapter 20, “Consciousness and Quantum Information.” He starts by unpacking the fascinating findings of quantum physics, showing how these discoveries have painted a picture of a natural world that is surprisingly devoid of material substances. Gordon contends that this understanding propels us towards theistic quantum idealism. This perspective suggests that our perception of an external physical reality is, in essence, our subjective experience of God’s thoughts. Moreover, he presents evidence from quantum cosmology supporting the broad view that reality is a single, timeless mental act through which God conceived and brought forth the universe. He outlines a framework for a quantum-informational neuroscience and discusses its role in studying neural systems and their connection to conscious experiences.

To answer the question of how conscious minds interact with the world, Gordon turns

to the metaphysical basis of theistic conscious realism. In closing, he explores a variety of additional topics, including near-death experiences, theistic beliefs about life after death, and a broad approach to scientific practice in light of this conception of reality.

Chapter 21, by Eric Holloway and Robert J. Marks II, is titled “Human Creativity Based on Naturalism Does Not Compute.” In this chapter, the authors pose the intriguing question of whether the physical, human brain is capable of creating the large volumes of creative prose that humans regularly produce. Holloway and Marks analyze this problem by conducting an informational analysis of a simpler problem, namely the probability that *any* meaningful phrase can be generated by chance. Explaining essential concepts such as active information and the conservation of information along the way, the authors reach the remarkable finding that the entire universe’s informational capacity is far exceeded by the demands of a single book. Thus, Holloway and Marks conclude that human literary creativity cannot be explained by merely naturalistic computational brain activity.

Chapter 22, by Winston Ewert, is entitled “The Human Mind’s Sophisticated Algorithm and Its Implications.” In this chapter, Ewert explores the extent to which the human mind can be compared to a computer. Setting aside the question of phenomenal consciousness for the moment, Ewert concentrates on the cognitive problem-solving abilities of the human mind. To facilitate his analysis, Ewert introduces the concept of the halting problem, a unique computational task that involves determining whether a given program or procedure will cease or loop indefinitely.

Ewert demonstrates that the halting problem is logically equivalent to a variety of essential human tasks, including mathematical reasoning, pattern detection, prediction making, and item

searching, implying that findings about the halting problem could have wide-ranging implications. Importantly, it has been proven that no program can possibly exist that solves the halting problem for every possible problem. Ewert likens human cognition to the ability to solve the halting problem for a limited range of programs.

After addressing some criticisms of his stance, Ewert extends his analysis, concluding that humans will never create an artificial intelligence (AI) that can match human intelligence, nor will an AI system ever self-generate another AI system superior to itself. Ultimately, Ewert suggests that his conclusions point to an origin of the human mind in a form of intelligence that is non-computational, transcending the constraints of the halting problem.

In Chapter 23, “Mathematical Objects are Non-Physical, So We Are Too,” Selmer Bringsjord and Naveen Sundar Govindarajulu consider our ability to understand and interact with logico-mathematical objects. The authors provide several examples of these objects, including the Quicksort algorithm—a well-known algorithm in computer science which sorts a list of ordered objects (e.g., numbers)—and *modus tollens*, an inference schema in propositional logic, i.e., “If P, then Q. Not Q. Therefore, Not P.” As the first step in their two-part argument, Bringsjord and Govindarajulu argue that these objects—distinct from their concrete embodiments, for example, in a programming language—are indeed non-physical. In the second step, the authors argue that our *understanding* of these objects indicates that we are more than merely material, biological computing machines; we must possess at least some immaterial aspect.

In Chapter 24, titled “Can Integrated Information Theory or the Theory of Cognitive Consciousness Explain Consciousness?,” Naveen Sundar Govindarajulu and Selmer

Bringsjord examine two proposed theories aimed at scientifically explaining consciousness: Integrated Information Theory (IIT), conceptualized by neuroscientist and psychiatrist Giulio Tononi and extensively promoted today by neurophysiologist and computational neuroscientist Christof Koch, and the Theory of Cognitive Consciousness (TCC), which is currently developed by Govindarajulu and Bringsjord. IIT aims to provide a scientific explanation of phenomenal consciousness—our subjective experience of the world—whereas TCC focuses on cognitive consciousness, which has to do with the contents and structure of our cognition.

The authors first elucidate what is typically meant by a “scientific explanation,” applying this understanding to the task of scientifically explaining consciousness. Armed with this framework, Govindarajulu and Bringsjord embark on their analysis of the two theories. They conclude that IIT is arguably based on some debatable axioms and postulates, and that the success of this theory remains to be definitively determined. Lastly, the authors assess their own theory, TCC, arguing that it is an extraordinarily productive model for guiding future engineering work aimed at constructing high levels of cognitive consciousness in artificial systems.

In Chapter 25, “How Information Realism Dissolves the Mind-Body Problem,” William Dembski concludes the anthology by integrating ideas from information theory together with metaphysical concepts, thereby introducing the notion of informational realism. Dembski describes informational realism as the belief “that the defining characteristic of reality is the ability to exchange information.” Informational realism adopts a minimalist ontology; it neither prescribes nor excludes specific metaphysical substances such as matter or spirit. Instead, it posits that the fundamental entities of reality

are information sources that generate information, which is then received by other sources; these sources gain their reality through this reciprocal exchange of information.

Dembski contrasts major historical perspectives with informational realism, including Aristotelian hylomorphism, Plato's theory of forms, and Berkeleyan idealism. Dembski underscores that informational realism's primary virtue lies in not setting rigid metaphysical claims a priori, instead leaving room for philosophical and scientific exploration. He criticizes materialism specifically for its a priori insistence on certain types of information sources, which could potentially limit our understanding of reality's true nature. By avoiding a priori presumptions, Dembski suggests, we are free to examine the nature of the informational exchanges and thereby draw inferences about the metaphysical nature of the information sources.

Conclusion

FROM THE foregoing summary of this volume, we can see that there is ample evidence across a spectrum of specialties that the mind is more than the brain.

In his book *A Brief History of Time*, physicist Stephen Hawking claims nothing in physics is ever proven. We simply accumulate evidence. Drop a pencil and watch it fall. This is additional evidence for something called "gravity." Similarly, this anthology has not proven that aspects of the mind are disjoint from the corporeal brain, but has presented strong evidence of such separation. This central theme has herein been articulated through the lens of diverse philosophical, medical, mathematical, psychological, and scientific perspectives. Over the past century, materialism has predominantly

guided our approach to these topics, yet has repeatedly failed to adequately account for the core attributes of the mental. Evidence for a non-materialist account is accumulating.

As articulated above, several compelling non-materialistic models are available as alternatives to physicalism. As exhibited by the chapters in this anthology, these alternatives exhibit remarkable potential in elucidating the nature of the mind and brain. The shared conviction of this anthology's editors and contributing authors is that these frameworks warrant further exploration in a multidisciplinary manner, fostering promising lines of inquiry for a new generation of philosophical and scientific discovery.

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