

DOI: <https://doi.org/10.56315/PSCF3-25Hannam>

THE GLOBE: How the Earth Became Round by James Hannam. Reaktion Books, 2023. 376 pages. Hardcover; \$27.00. ISBN: 9781789147582.

One might summarize this book with the classic questions: “What did they know? When did they know it?” That’s far too brief a summary, but those are the questions this book addresses, along with how knowledge of the globe spread. James Hannam has given us a well-documented history of belief in a spherical earth from ancient times to the present century.

The author is a British historian of science with a physics degree from Oxford and a PhD in history and philosophy of science from Cambridge. His best-known previous book is *God’s Philosophers: How the Medieval World Laid the Foundations of Modern Science* (in the UK), and retitled in the US as *The Genesis of Science: How the Christian Middle Ages Launched the Scientific Revolution*. While his religious beliefs were not completely clear to this reviewer from reading the present book, some online postings indicate he is a Catholic.

Globe is divided into 23 chapters, plus an introduction and an afterword, in about 300 pages. These are followed by about 30 pages of references documenting his sources and 16 pages of bibliography, as well as a thorough index. As one might expect, the chapters are arranged roughly chronologically from ancient Babylon and Egypt up through the Greeks, Romans, Medieval Europe, and on to today. There are separate chapters dealing with India and China throughout many centuries, as well as Persians, Judaism, Christianity, and Islam. The information is often densely packed and it is possible to get lost in details. Historians will find all the details and references they could wish for, while more casual readers may want to look at the bigger picture and pursue details only in sections they find of particular interest.

Today we all know the earth is spherical, but as we look around us on a daily basis the earth appears flat. In ancient times, the idea of a flat earth seemed entirely reasonable. So how did the idea of a spherical earth arise? There are a number of simple observations indicative of this, but many people were not in a position to recognize them. When ships head out to sea one can see the evidence as ships’ hulls disappear from view before the tops of their masts. The shadow of the earth on the moon during a lunar eclipse is always curved, but one must understand that the eclipse is a shadow, not an astrological omen. Anyone who travels large distances can see the changes in the night sky as northern stars fall below the horizon when one heads south and southern stars appear higher, but the distance traveled must be hundreds of miles, not tens of miles. All these pieces of evidence came together for the ancient Greeks, but not for anyone else.

I will summarize some of the development, hoping this will spur PSCF readers to dig into the book itself.

Both ancient Babylon and ancient Egypt built up considerable astronomical knowledge, the former for astrological purposes and the latter to calibrate a solar calendar to predict Nile floods. The shape of the earth was not really a concern for either. There were Greeks, however, who thought about the shape of the earth. One must here be cautious, since claims that Greeks believed in a spherical earth very early may be translation confusions (the Greek word for “round,” as in English and Latin, can mean either a disk or a sphere), and other claims are erroneous attributions by later writers. Nevertheless, by the fifth century BC, the Greeks had developed a model of the flat earth as a circular disc surrounded by a spherical universe. In this model, the sun was below the disk at night, but its light still illuminated the moon and the shadow of the disk could cause a lunar eclipse. Furthermore, the moon itself could block one’s view of the sun, causing a solar eclipse. Thus, eclipses were recognized as physical phenomena rather than omens; this observation was major progress in scientific understanding.

By the fourth century BC, there were apparently ideas of a spherical earth discussed among a number of Greeks, and some of Plato’s writings indicate he believed this. Hannam draws a distinction between believing, as Plato did, and knowing, as Aristotle did. Knowing involved a good deal of evidence and an underlying theory (even though much of Aristotle’s theory was actually wrong). Hannam therefore credits Aristotle as the first to know the earth was spherical. This knowledge then spread in the lands conquered by the Greeks, and by their successors, the Romans, a few centuries later.

PSCF readers may be most interested in the chapters dealing with Jewish and Christian beliefs. Hannam indicates that he considers both the Old and New Testaments to have been written from a flat earth perspective. He rarely deals directly with biblical texts but does raise an interesting point regarding passages dealing with the temptations of Christ. Matthew wrote that Satan took Christ to a high mountain to view the kingdoms of the world (possible only on a flat earth), whereas Luke (presumably having had a good Greek education) says Satan took Christ to a high place. The wording in the original Greek text is definitely different, with the latter allowing the possibility of a vantage point above a spherical earth while not confusing readers who believed in a flat earth. We probably will have to wait until we reach heaven to learn what happened and whether this wording difference is significant.

This reviewer, like many others, was long ago taught the myth that Columbus had to convince Spanish authorities that his sailors were afraid of sailing off the edge of

Book Reviews

the earth, and that the earth was spherical. The reality was that Europeans at that time were well aware the earth was spherical, and the major issue for Columbus and Spanish authorities was how long the trip would be and whether the ships could carry enough food and water for their crews. The myth relating to Columbus traces mostly to a highly fictionalized biography of him by Washington Irving, amplified by others who wanted to make Christians (especially Catholics) look bad by pushing the false idea of warfare between science and Christianity. Unfortunately, the myth has been very slow to die out.

Who is this book for? I could imagine a history of science course for upper-level undergraduate or graduate students based on it, or selected parts being assigned in such a course. The audience for the book, however, should be much larger. Readers with an interest in history of science or philosophy of science would probably find it interesting and would learn from it. Those who primarily want the bigger picture may want to skim over some details. Anyone who wonders how the spherical earth idea reached and was received by non-western cultures is encouraged to read the book.

Reviewed by Kyle Cudworth, former director, Yerkes Observatory, Williams Bay, WI, and professor emeritus of astronomy and astrophysics, The University of Chicago.

PHILOSOPHY OF SCIENCE

DOI: <https://doi.org/10.56315/PSCF3-25Metzinger>

THE ELEPHANT AND THE BLIND: The Experience of Pure Consciousness—Philosophy, Science, and 500+ Experiential Reports by Thomas Metzinger. MIT Press, 2024. 648 pages. Paperback; \$80.00. ISBN: 9780262547109.

What is consciousness and how can science fruitfully study it? In this book, Thomas Metzinger proposes that the experience of pure awareness occurs without “subjectivity” and will help science uncover the “core causal factors” underlying consciousness. Science can then build on this minimal model for a more comprehensive theory. However, consciousness studies face a major problem: “Three decades after the Association for the Scientific Study of Consciousness was founded in 1994, we still do not even know (or cannot agree on) what precisely it is that needs to be explained” (p. xiv). Toward a solution, Metzinger contends that pure awareness is the simplest kind of experience, namely, the experience of awareness *as such*. With this hypothesis, science might verify whether pure awareness is the phenomenal-neurological boundary between the conscious and the unconscious. Believing that meditation helps people access pure awareness, Metzinger surveyed over 1,400 meditators who have experienced this phenomenon, labelling this the minimal phenomenal experience project (MPEP) and,

in this book, reports more than 500 of the 841 narratives from the project. The result: he identifies phenomenal markers that help neuroscience map the causal correlates common to all conscious experiences.

Grouping meditative reports by chapter, Metzinger describes experiences of awareness that come from diverse meditative practices. Though he includes statistical analysis (from the MPEP), he concentrates on filtering reports by qualitative criteria. In each chapter, he selects reports from the narrative part of the survey and then groups them into phenomenal categories. Metzinger investigates over thirty experiences, some of which overlap with ordinary wakeful life (e.g., peace). Others (e.g., luminosity) are less familiar. Several are even difficult to describe without paradoxical metaphor (e.g., timeless change). Intended for a general audience, the chapters are readable and, typically, brief. Since jargon is unavoidable, a glossary clarifies new and abstract concepts. Other virtues of the book: Metzinger proposes a methodology for neuroscience to isolate and reproduce pure awareness, and he also suggests philosophical lessons about how pure awareness informs the theory of evidence. Overall, his reflections might inspire psychology, neuroscience, and philosophy with new phenomenal concepts.

As his main contribution, Metzinger introduces minimal phenomenal experience (MPE) as a trustworthy way of investigating consciousness. Such experiences are the simplest kind – causally and experientially – that we in fact have. In their narrative responses, meditators report either no discernible mental contents (i.e., an experience without a noticeable object) or contents “along with the deeper nature of consciousness” (p. xiii). According to Metzinger, pure awareness is a candidate MPE. He speculates that pure awareness might be the experience of the capacity to know – but without any known object. In his scientific aim to isolate MPE, Metzinger makes two methodological assumptions: (1) Introspective knowledge defines the target for the scientific investigation of consciousness; and (2) if a state is experientially simple, its neurological basis must be correspondingly simple. Without these assumptions, his study cannot help science uncover the neuro-correlates of conscious experience.

Metzinger weaves three major themes throughout his book. First, pure awareness occurs as a global way of being conscious, without discernible contents, and, at times, as a state with ordinary experiences as contents. In full-absorption episodes, for example, meditators report being conscious but without thought and perception, without a localized body-experience, and without felt agency and self-awareness. Meditative experiences in which one is fully absorbed are ineffable but later reportable. If they are states of pure awareness, the only reportable feature is the quality of awareness. As a state