

Chapter 8

A Brief Story of Success: The Manifestation of Knowledge and the Hydra of Ignorance



Abstract It is tempting to declare the victory of the human mind over ignorance. By applying pure thought the workings of the universe are deciphered, from fundamental processes to complex phenomena. Uncertainty has been banished, or so it seems. With pride the insights the mind has uncovered are swiftly translated into technology, bearing witness to the powers of the human intellect. Yet, astonishingly, the grand narrative does not end here. Indeed, it only truly begins. What remains to be explained are still the same age-old questions vexing the human mind. Why is there anything at all? What can I really know? What is the true nature of reality? What exactly is consciousness? What about all the strange cosmic coincidences leading up to this moment? Confronting these questions evokes existential dilemmas, ontological paradoxes, and epistemic uncertainty. The foundations of the edifice of knowledge start to shift and cracks emerge.

Level of mathematical formality: not applicable.

The quest to comprehend the world we live in has taken humanity on a true odyssey—a journey similar to the archetypal hero who “ventures forth from the world of common day into a region of supernatural wonder” (Campbell 2008, p. 23) and returns, bestowed with new powers. Likewise, the inquisitive mind of humans set out to search for the Book of Nature, containing all knowledge of the world, and returned with a mastery able to radically engineer reality. In the poetic words of Joseph Campbell, a scholar of comparative mythology and religion, humanity’s journey can be summarized as follows (Campbell 2008, p. 334):

It is the hero-cycle of the modern age, the wonder-story of mankind’s coming to maturity. The spell of the past, the bondage of tradition, was shattered with sure and mighty strokes. The dream-web of myth fell away; the mind opened to full waking consciousness; and modern man emerged from ancient ignorance, like a butterfly from its cocoon, or like the sun at dawn from the womb of mother night.

It is not only that there is no hiding place for the gods from the searching telescope and microscope; there is no such society any more as the gods once supported. The social unit is not a carrier of religious content, but an economic-political organization. Its ideals are not those of the hieratic pantomime, making visible on earth the forms of heaven, but of the secular state, in hard and unremitting competition for material supremacy and resources.

Such a hero's journey is known as a monomyth, as it acts as a template for myths from around the world.

This odyssey of the human mind is recounted in Part I. Chapter 2 describes the realization that mathematics underlies the workings of the world and outlines the ensuing attempts to unearth this Book of Nature. Then, Chaps. 3 and 4 give detailed insights into the mathematization of nature, guided by the notion of symmetry. Under closer inspection, what was assumed to be the entire contents of the Book of Nature is discovered to be only one specific mode of human knowledge generation. The Book of Nature is revealed to be comprised of two volumes. In Chap. 5 a synthesis is given, summarizing and categorizing the possible modes of knowledge generation. The content of Volume II of the Book of Nature, decoding complexity, is revealed in Chaps. 6 and 7. Both volumes are driven by a translational process encoding aspects of the physical world into abstract representations, unified by continuous and discrete mathematics, respectively. The discovery of the two volumes of the Book of Nature uncovers intimate insights into a vast array of fundamental and complex phenomena, ranging from the quantum world to the fabric of the cosmos and the wonder of life in between. This unveiling of knowledge is driving the acceleration of technological advances and is having an unprecedented impact on how human societies organize themselves and interact with their environment (see, for instance, Sect. 7.4.1 and the Epilogue). Indeed, it can hardly be overstated how transformative the understanding of the workings of reality has become.

However, it is an interesting idiosyncrasy of our times that, as a society, we have become increasingly accustomed to the ongoing success of the human mind in probing reality and understanding the world we live in. Indeed, we take many modern aspects of life for granted which would have perplexed many great thinkers not too long ago. Today, even the most breathtaking technological breakthroughs, fostered by this ever growing body of knowledge, describing the universe and ourselves in greater and greater detail, can hardly capture the collective attention span for long. It is as if humanity has come to expect technological wizardry at a steadily accelerating pace. However, simply looking back at, for instance, the evolution of personal computers, information technology, and the Internet in the last decades should instill a sense of awe in everyone. Likewise, looking into the future, anticipating likely advancements in machine learning, artificial intelligence, nanotechnology, bionics, robotics, and autonomous drones, should leave one spellbound. Indeed, genetic engineering (specifically gene editing techniques), brain-computer interfaces, brain-scanning techniques, and pharmacology promise an eerie age of human enhancement just around the corner. Moreover, the socially disruptive potential of the blockchain (Sect. 7.4.3), the Internet of Things, virtual reality, and 3D printing should definitely not be underestimated. We are living at the threshold of a brave new world, materializing itself from pure knowledge. In the words of the historian Yuval Harari (Harari 2015, p. 463):

[...] the next stage of history will include not only technological and organizational transformations, but also fundamental transformations in human identity. And these could be transformations so fundamental that they will call the very term "human" into question.

So, finally, the hero returns home, bestowed with great new powers. The tremendous success of the human mind's capacity to decode reality, and the resulting capabilities for engineering the world we live in through technology, is perhaps the most significant achievement ever to have emerged on Earth or elsewhere. Knowledge has become manifested. In the words of the physicist Marcelo Gleiser (Gleiser 2014, p. 279):

The grand narrative that is the scientific enterprise must be celebrated as one of the greatest achievements of the human intellect, a true testimonial to our collective ability to jointly create knowledge. Science is a response to our urge to understand, to make sense of the world we live in and of our place in it. It addresses the same age-old questions that have haunted and inspired humanity throughout the ages, questions of origins and endings, of place and meaning. We need to know who we are; we need to know where we are and how we got here. Science speaks directly to our humanity, to our quest for light, ever more light.

Here the monomyth ends—but, alas, not the human mind's struggle.

8.1 Clouds on the Horizon

Why doesn't this spectacularly successful adventure end here? Why doesn't Volume II of the Book of Nature close with the metaphoric final worlds "happily ever after?" It is a great irony—and a magnificent plot twist—that the anticipated ending of this narrative opens up Pandora's box of existential dilemmas, ontological paradoxes, and epistemic uncertainty.

Notwithstanding all the manifested knowledge humans have access to, these age-old questions still stand unanswered:

- Why does anything exist at all? Let alone life and consciousness.
- What can I learn, know, and understand about reality?
- What is reality's true nature?
- What is the true nature of the subjective stream of consciousness which I experience as being myself?
- In retrospect, looking at the 13.772-billion-year history of the universe, a plethora of coincidences guided its chaotic path-dependent evolution to this very moment now. How would the universe look today if time were to rewind and everything re-merged from the Big Bang and self-organized for another 13.772 billion years? And then again?

In a nutshell, the greatest mysteries of existence are still as elusive as ever. Ignorance and uncertainty prevail (Gleiser 2014, p. 280):

As we probe Nature and master so many of its facets, it is good to remember that the shores of ignorance grow as the Island of Knowledge grows: the ocean of the unknown feeds on our success. It is also good to remember that science only covers part of the Island, that there are many ways of knowing that can and should feed on one another.

8.1.1 *Uncertainty*

There has been a long tradition of great thinkers expressing self-doubt and uncertainty relating to knowledge. A couple of hundred years B.C.E., in ancient China, Lao Tzu, the founder of Taoism, offered the following musing (Le Guin 1997, Verse 47, p. 62):

The farther you go, the less you know.

This sentiment has famously been captured by the proverb “the more you know, the less you understand.” A little later, Socrates, one of the founders of Western philosophy, chimed in. In essence, “Socrates’ historic mission was the discovery of ignorance” (Boorstin 1999, p. 34):

I know that I know nothing.

This saying, also known as the Socratic paradox, is derived from Plato’s account of his teacher Socrates in “The Apology”, see for instance Popper (2009, p. xix). A very similar proverb is also attributed to the Chinese philosopher Confucius: “Real knowledge is to know the extent of one’s ignorance.” Centuries later, the Roman emperor Marcus Aurelius is said to have remarked: “Everything we hear is an opinion, not a fact. Everything we see is a perspective, not the truth.”

This self-critical analysis of one’s own ignorance can be heard to echo into modern times, as expressed by some of the keen thinkers. For instance, the essayist, historian, and philosopher Voltaire, who wrote in a letter to Frederick II of Prussia, dated April 6, 1767:

Doubt is not a pleasant condition, but certainty is absurd.

Or the eminent mathematician and philosopher and Bertrand Russell (Russell 2009, p. 676):

One of the painful things about our times is that those who feel certainty are stupid, and those with any imagination and understanding are filled with doubt and indecision.

The influential philosopher of science Karl Popper observed (Popper 2000, p. 50):

I believe that it is worthwhile trying to discover more about the world, even if this only teaches us how little we know. It might do us good to remember from time to time that, while differing widely in the various little bits we know, in our infinite ignorance we are all equal.

In essence (Popper 2000, p. 50):

The main source of our ignorance lies in the fact that our knowledge can only be finite, while our ignorance must necessarily be infinite.

Daniel Kahneman, the Nobel laureate who helped develop behavioral economics, had the following to offer (Kahneman 2011, p. 201):

Paradoxically, it is easier to construct a coherent story when you know little, when there are fewer pieces to fit into the puzzle. Our comforting conviction that the world makes sense rests on a secure foundation: our almost unlimited ability to ignore our ignorance.

This tension between the poles of understanding and ignorance also enters children's books (Milne 1928):

"Rabbit's clever," said Pooh thoughtfully.
 "Yes," said Piglet, "Rabbit's clever."
 "And he has Brain."
 "Yes," said Piglet, "Rabbit has Brain."
 There was a long silence.
 "I suppose," said Pooh, "that's why he never understands anything."

Indeed, one of the greatest poets let the main character famously allude to the limitations of human knowledge (*The Tragedy of Hamlet, Prince of Denmark*, Act 1, Scene V in Shakespeare 1623):

There are more things in heaven and Earth, Horatio, than are dreamt of in your philosophy.

While our knowledge of the world has clearly increased dramatically, the realization of the limits of understanding has been more gradual, ambiguous and vague. The growth of uncertainty can be ignored for some time before it poses a serious challenge. In his epic book, called *The Passion of the Western Mind*, the cultural historian Richard Tarnas analyzes the ideas of the last two and a half millennia that have shaped our modern worldview. His verdict on this simultaneous increase in knowledge and uncertainty (Tarnas 1991, p. 325):

For perhaps the most momentous paradox concerning the character of the modern era was the curious manner in which its progress during the centuries following the Scientific Revolution and the Enlightenment brought Western man unprecedented freedom, power, expansion, breadth of knowledge, depth of insight and concrete success, and yet simultaneously served—first subtly and later critically—to undermine the human being's existential situation on virtually every front: metaphysical and cosmological, epistemological, psychological, and finally even biological.

The most developed theory of ignorance in modern philosophy is that of Immanuel Kant. In a nutshell, his classic *Critique of Pure Reason* (Kant 1781) asserts that (Rescher 2009a, p. 22):

[...] while we can know the things we encounter in our experiential interactions with the world's realities, those realities as such (the realm of "things in themselves") are inherently unknowable to us.

Reality is split into the distinct realms of *phenomena* and *noumena*—in other words, things as they appear to us and things as they are in themselves. Expressed in greater detail and in the eloquent words of Tarnas (1991):

[...] in Kant's view, the nature of the human mind is such that it does not passively receive sense data. Rather, it actively digests and structures them, and man therefore knows objective reality precisely to the extent that that reality conforms to the fundamental structures of the mind. The world addressed by science corresponds to principles in the mind because the only world available to the mind is already organized in accordance with the mind's own processes. All human cognition of the world is channeled through the human mind's categories. The necessity and certainty of scientific knowledge derive from the mind, and are embedded in the mind's perception and understanding of the world. They do not derive from nature

independent of the mind, which in fact can never be known itself. What man knows is a world permeated by his knowledge, and causality and the necessary laws of science are built into the framework of his cognition. Observations alone do not give man certain laws; those laws reflect the laws of man's mental organization. In the act of human cognition, the mind does not conform to things; things conform to the mind [p. 343].

[...]

Space and time are thus not drawn from experience but are presupposed in experience. They are never observed as such, but they constitute that context within which all events observed. They cannot be known to exist in nature independently of the mind, but the world cannot be known by the mind without them [p. 343].

[...]

For the only world that man knows is the empirical world of phenomena, of "appearances," and that world exists only to the extent that man participates in its construction [p. 345].

[...]

Kant's penetrating critique had effectively pulled the rug out from under the human mind's pretensions to certain knowledge of things in themselves, eliminating in principle any human cognition of the ground of the world [p. 351].

[...]

The course of modern philosophy unfolded under the impact of Kant's epochal distinctions [p. 351].

See also Sects. [11.2.1](#) and [14.3.5](#).

To this day, scientists and philosophers are grappling with certainty, unknowability, and ignorance. Indeed (Rescher [2009a](#), p. 4):

One of the most obvious sources of ignorance is the sheer volume of available functional information. [...] The vastness of any given person's ignorance is unfathomable.

Exacerbating the problem, our modern interconnected digital world is an ideal host for parasitic misinformation (Seife [2014](#)). Moreover, what is considered as facts is in constant flux (Arbesman [2012](#)). Then again, others have argued that ignorance—not knowledge—is the true engine of science (Firestein [2012](#)). Contemporary philosophers have started to formulate a theory of unknowability, illuminating the practical and theoretical limits to the human mind's capacity to know the world (Rescher [2009b](#)). Also scientists have chimed in. For instance, Noson Yanofsky, a scholar of quantum computing (Yanofsky [2013](#), p. x):

While exploring these various limitations in diverse areas [language, philosophy, mathematics, logic, computing, and science], we will see that many of the limitations have a similar pattern. These patterns will be investigated in order to better understand the structure of reason and its limits.

Ignorance raises the thorny issue of skepticism (Stroud [1984](#); Frances [2005](#)). The conviction that there exists no secure knowledge of the world has been debated for ages. The Western tradition of systematic skepticism goes back to the Greek philosopher Pyrrho of Elis. It is a double-edged sword as it can be used to attack not only unfounded beliefs and superstitions but science itself. As such, skepticism can be utilized as a tool to liberate the mind or as a destructive weapon. Some philosophers

have argued that unyielding skepticism is absurd (Rescher 1980). Indeed (Rescher 2009a, p. x):

The really problematic issue is one the skeptic simply avoids with his all-out denial of knowledge—namely, that of setting out the burden between what is knowable and what is not, exploring its placement and examining its rationale.

Biologist and researcher in the field of parapsychology, Rupert Sheldrake, observes (quoted in Brockman 2008):

In practice, the goal of skepticism is not the discovery of truth, but the exposure of other people's errors. It plays a useful role in science, religion, scholarship, and common sense. But we need to remember that it is a weapon serving belief or self-interest; we need to be skeptical of skeptics. The more militant the skeptic, the stronger the belief.

In essence, an open mind guided by a healthy level of skepticism is the ideal of an inquisitive and enlightened mind.

8.1.2 *Why Anything?*

Three centuries ago Gottfried Wilhelm Leibniz, a mathematician, physicist, and philosopher, posed one of the greatest questions of all times (Dascal 2008, p. 452):

Why is there something rather than nothing? For nothingness is simpler and easier than anything.

The question is rephrased by the cosmologist Stephen Hawking (Hawking 2008, p. 142):

Why does the universe go to all the bother of existing?

This deep and haunting ontological question has inspired many answers coming from philosophy, theology, spirituality, and, ultimately, physics. While some scholars have argued that the question “Why anything?” is illegitimate and improper, others have alleged that “nothingness” is inherently impossible. As an example, Russell simply evaded the question (quoted in Leslie and Kuhn 2013, p. 14):

I should say that the universe is just there, and that is all.

In a similar vein, the philosopher Ludwig Wittgenstein (quoted in Leslie and Kuhn 2013, p. 14):

It is nonsense to say that I wonder at the existence of the world, because I cannot imagine it not existing.

Today, some scientists are more empathetic. In the words of the MIT-physicist Sunny Y. Auyang, found in her book *How is Quantum Field Theory Possible?* (Auyang 1995, p. 194):

The interpretation of quantum field theory presented in the preceding chapters implicitly contains a notion of the mind. The mind is understood not as an intelligent object but as the intelligibility of objects. The eternal mystery of the world is its comprehensibility, and the most profound astonishment lies in the fact that anything is experienced at all.

Assuming the question is legitimate and answerable, there are four main angles of attack (Leslie and Kuhn 2013):

- Existence is a brute fact.
- A transcendent agency created the world. For instance, as suggested by Hindu and Islamic writings, that the universe is “a structure or pattern of activity inside an infinite divine being” (Leslie and Kuhn 2013, p. 1).
- A principle of creativity accounts for existence. Plato suggested that the abstract need for there to be good accounts for why there is a cosmos (Leslie 2001).
- Laws of nature necessitate existence. In this case, once the human mind discovers the ultimate theory of everything, all questions will be answered.

Other attempts at explaining existence address the nature of the reality everything exists in Leslie and Kuhn (2013):

Again, people have argued that we, together with all the other things in what we call “our universe,” could be patterns of activity inside one of the gigantic computers that a technologically advanced civilization might be expected to use for “simulating” universes.

Some thinkers have claimed that existence necessitates at least one mind or some form of distributed consciousness—an entity capable of experiencing something. Physicists have the daunting task of explaining why our universe appears to be fine-tuned for conscious life (Sect. 15.2). In other words, only the perfect fine-tuning of physical constants allows a complexly structured universe to emerge from the Big Bang. The Anthropic Principle—a cosmological principle stating that theories of the universe must be constrained by the necessity to allow human consciousness—and the multiverse (see Sect. 10.3.2.2) have been conjured up as explanations.

The simple question “Why anything?” has inspired many very different explanations (Holt 2012; Leslie and Kuhn 2013). In the end we are left with the words of Nobel laureate Steven Weinberg (quoted in Leslie and Kuhn 2013, p. 15):

Whatever our final theory of physics, we will be left facing an irreducible mystery. For perhaps there could have been nothing at all. Not even empty space, but just absolute nothing [...] If you believe God is the creator, well, why is God that way? The religious person is left with a mystery which is no less than the mystery with which science leaves us.

Indeed (Horgan 2012):

[...] when scientists insist that they have solved, or will soon solve, all mysteries, including the biggest mystery of all [Why anything?], they do a disservice to science; they become the mirror images of the religious fundamentalists they despise.

In physics, the vacuum, i.e., absolutely empty space, is the concept which captures nothingness. It turned out to be a very strange entity, within both quantum field theory (Sect. 10.1.1) and cosmology (Sect. 10.1.2). For further reading on the strange notion of nothingness, see, for instance Genz (1999), Barrow (2000), Close (2009), Weatherall (2016).

8.1.3 *A Short Narrative of Cosmic Coincidences*

In this very moment, you are consciously reading this sentence in your mind. An astonishing series of events had to occur in the evolution of the universe for this moment to transpire. In a nutshell:

1. From an initial singularity...
2. a fine-tuned universe (Davies 2008) was spawned, furnished with laws of nature (Penrose 2004)...
3. filled with energy, expanding in three spacial dimensions, and evolving in time (Weinberg 1993)...
4. where quantum fluctuations seeded the large scale structure of the universe via gravity (Peacock 1999)...
5. and triggered self-organized structure formation driving the cosmos to ever greater complexity (Eigen 2013)...
6. where fusion ignited the first stars and furnished the first heavy elements, like carbon and oxygen, which got scattered into the cosmos when the stars exploded as supernovae (Carroll and Ostlie 2006)...
7. eons later, the Earth was formed and accumulated water (Robert 2001), which could remain liquid as Earth orbits the Sun at exactly the right distance (the circumstellar habitable zone or Goldilocks zone)...
8. allowing the assembly of organic matter, which could store information and replicate (Dawkins 1976) due to the specific bonding propertied of carbon (Wade Jr. 2012)...
9. sparking the evolution of life on Earth which fundamentally depends on the special anomalies of liquid water (Barrow et al. 2010) and which gradually reached ever higher and higher levels of complexity (Brooker et al. 2013)...
10. this evolutionary process depended on the emergence of the first organisms able to harness the energy emanating from the Sun by unlocking the secret of photosynthesis (Des Marais 2000), an event marking the beginning of the terraforming of an oxygen-filled atmosphere by cyanobacteria (Knoll 2015)...
11. resulting in the self-organized engineering of complex life forms from Eukaryotic cells (Hedges et al. 2004)...
12. later, the emergence of the Cambrian explosion, an evolutionary burst filled the seas with an unprecedented diversity of organisms (Morris 2000)...
13. which, by evolving into a species of insects, started to display a collection of social behaviors, establishing cooperative interactions as a successful template for evolution (Damasio 2018)...
14. the evolutionary process was constantly challenged by the occurrence of various mass extinction events, some leading to the eradication of nearly all of the biodiversity on Earth (Purvis and Hector 2000)...
15. for instance, the Cretaceous extinction event resulting in the perishing of non-avian dinosaurs, thrusting mammals from obscurity to prominence and setting the path for their planetary domination (Rose 2006)...

16. as a lump of organic matter, organized as a neural network comprised of billions of nodes and trillions of links, became self-aware by virtue of electrochemical processes (Siegel and Sapru 2015)...
17. from which a conscious experience sprang and a human observer emerged (Metzinger 2009)...
18. ultimately leading to the demise of all competing human species except one, a single remaining lineage of would-be conquerors of the solar system, by virtue of Homo sapiens' Cognitive Revolution—the capacity for abstract thought in the brain (Harari 2015), igniting culture and language (Laland 2017)...
19. now, a creature had emerged that looked at itself and out into the world with great wonder (Boorstin 1985; Russell 2004; Leslie and Kuhn 2013)...
20. and thus discovered the two volumes of the Book of Nature (Hawking 1988; Tarnas 1991; Wolfram 2002; Gribbin 2003; Bryson 2004; Penrose 2004; Davies 2007; Christian 2011; Eigen 2013; Hoyningen-Huene 2013; Weinberg 2015; Barabási 2016; Damasio 2018)...
21. which allows for the reconstruction of this story and provides the knowledge for the technology able to precisely measure the world and thus verify these series of events.

In retrospect we can look at this cosmic story and simply shrug. It is a brute fact that it unfolded. However, a little contemplation should instill a profound sense of dumbfoundedness and confusion in the light of this unfathomable unlikeliness and cosmic improbability. As observed by the eminent cosmologist Martin Rees and the science writer John Gribbin (Gribbin and Rees 2015, p. 287):

[T]here is one key ingredient in science, which is highlighted most effectively by the development of anthropic cosmology—a sense of wonder.

What would have happened if any of these fundamental events had not unfolded? Would the mammals still have exited their niche without the Cretaceous mass extinction? Would there then still be traces of terrestrial life on other planets, albeit non-human? What if Isaac Newton, Max Planck, Albert Einstein, Emmy Noether, or Alan Turing had died as infants? What if Adolf Hitler or Gautama Buddha had never been born? The infinite list of alternate realities is mind-numbing.

Some thinkers have confronted this cosmic chance by ascribing the universe a teleological nature (Sect. 15.2.1). For instance, theological arguments invoking an intelligent designer setting everything in place for the story to unfold as scripted. Or the notion of creationism, where a God (or gods) create afresh a contrived universe that looks ancient as it is littered with false empirical evidence. More intriguingly, the idea that reality is a simulation (see Sect. 13.4.2) could solve the problem of cosmic chance as the source code would necessarily dictate the evolution of the program. Or perhaps there exists a still undetected fundamental force in the universe which drives it to ever higher levels of information processing and hence ever more complexity. For instance, the theoretical biologist and complex systems researcher Stuart Kauffman feels “that accident alone cannot have created life; our cosmos must harbor some fundamental order-generating tendency” (Horgan 1997, p. 135).

In such a universe life, consciousness, and computation would inevitably emerge. Or maybe the physical universe is the manifestation of a template universe outside of existence. For instance, a Platonic realm of abstract ideas which project into the physical world and dictate its structure and behavior (see Fig. 2.2 in Chap. 2). This idea invokes the notion of entelechy. This is the principle which realizes or makes actual what is otherwise merely potential. Is our universe a manifestation of an other-world potentiality?

8.2 The Core Enigmas of Existence

The last two sections were rather speculative. While they ask profound questions and inspire out-of-the-box thinking, it is questionable if there exist any fruitful answers. In contrast, the whole of Part II outlines three problem clusters that are also existential enigmas, but which have the potential to shed new light on the human condition framed in a cosmic perspective. The three core enigmas of existence are phrased as questions:

1. What can I know? (Chap. 9)
2. What is reality? (Chap. 10)
3. What is consciousness? (Chap. 11)

These questions are associated with the corresponding problem clusters illustrated in Fig. 8.1 and discussed in the following. The root of these enigmas can be found in this simple observation (Gleiser 2014, p. 192):

For starters, everything that we can say about reality goes through our brain.

The flow of subjective experiences each conscious and hence observing entity witnesses, this continuous awareness of our own inner worlds of consciousness we are so familiar with, stands in stark contrast the external world outside of the mind. Yet our fleeting and incorporeal consciousness is embedded in the tangible, physical, and material.

What Can I Know and Understand?

The associated problem cluster comprises the following topics:

Epistemology, philosophy of science, laws of nature, the crisis of modern science, formal thought systems, and the limits thereof.

See Chap. 9.

The Physical World: What is Reality?

Here we are faced with questions relating to:

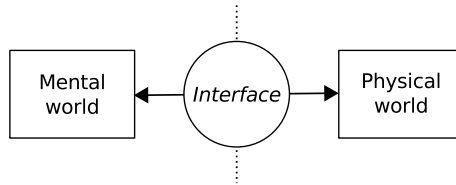


Fig. 8.1 Illustration of the problem clusters discussed in Part II, showing the mental world (“What is consciousness?”), the physical world (“What is reality?”) and the interface between the two (“What can I know?”). Recall Fig. 2.2, illustrating the three worlds (the abstract Platonic realm, external physical reality, and the human mind), next to Fig. 2.1, showing the role of the human mind in the interplay between the physical and the abstract realms

Ontology, objectivity, nature of time, nature of matter, quantum gravity, the vacuum, cosmology, and the interpretation of quantum mechanics.

See Chap. 10.

The Mental World: What am I?

Finally, the last problem complex addresses the following issues:

The philosophy of the mind and self, neuroscience, cognitive science, perception, subjectivity, personal identity, mind-body problem, and free will.

See Chap. 11.

Conclusion

After scaling what appeared to be the summit of knowledge, the human mind is suffering the downfall. From multiple angles the comforting certainty of knowledge is attacked. This chapter only attempts to set the stage for the remaining chapters in Part II to fill in the details. For instance, the next chapter introduces elements from the philosophy of science.

While the outlook may appear gloomy, these core enigmas of existence have the potential to transcend the prevailing categories of knowledge and uncover novel aspects of existence. Such a new horizon awaits in Part III.

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