Robert Hanna

Science for Humans

Mind, Life, The Formal-&-Natural Sciences, and A New Concept of Nature

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A Note on References to Kant's Works

For convenience, I cite Kant's works in parentheses. The citations include both an abbreviation of the English title and the corresponding volume and page numbers in the standard "Akademie" edition of Kant's works: *Kants gesammelte Schriften*, edited by the Königlich Preussischen (now Deutschen) Akademie der Wissenschaften (Berlin: G. Reimer [now de Gruyter], 1902–). For references to Kant's *Reflexionen*, I give the entry number in addition to the Akademie volume and page numbers. I generally follow the standard English translations of Kant's works but have occasionally modified them where appropriate. For references to the first *Critique*, I follow the common practice of giving page numbers from the A (1781) and B (1787) German editions only. Because the Akademie edition contains only the B edition of the first *Critique*, I have also consulted the following German composite edition: *Kritik der reinen Vernunft*, ed. W. Weischedel, Immanuel Kant Werkausgabe III (Frankfurt: Suhrkamp, 1968). Here is a list of the relevant abbreviations and English translations, along with the dates of their original eighteenth-century German publication followed by their Akademie volume numbers and page ranges:

C Immanuel Kant: Correspondence, 1759-99. Trans. A. Zweig. Cambridge: Cambridge University Press, 1999. [1749-1800, Ak 10, 11, 12]

CPJ *Critique of the Power of Judgment.* Trans. P. Guyer and E. Matthews. Cambridge: Cambridge University Press, 2000. [1790, Ak 5: 165–485]

CPJFI *First Introduction to the Critique of Judgment*. Trans. P. Guyer and E. Matthews. In *Critique of the Power of Judgment*. pp. 1–51. [1789, Ak 20: 20: 192–251]

CPR *Critique of Pure Reason*. Trans. P. Guyer and A. Wood. Cambridge: Cambridge University Press, 1997. [1781, 1787, Ak 3, 4: 1–252]

CPrR *Critique of Practical Reason.* Trans. M. Gregor. In *Immanuel Kant: Practical Philosophy*. Cambridge: Cambridge University Press, 1996. pp. 139–272. [1788, Ak 5: 1–163]

DDS "Concerning the Ultimate Ground of the Differentiation of Directions in Space." In *Immanuel Kant: Theoretical Philosophy*, *1755-1770*. Trans. D. Walford

and R. Meerbote. Cambridge: Cambridge University Press, 1992. pp. 361–372. [1768, Ak 2: 375–383]

GMM *Groundwork of the Metaphysics of Morals.* Trans. M. Gregor. In *Immanuel Kant: Practical Philosophy*. pp. 43–108. [1785, Ak 4: 385–463]

ID "On the Form and Principles of the Sensible and Intelligible World (Inaugural Dissertation)." In *Immanuel Kant: Theoretical Philosophy: 1755-1770*. pp. 373–416. [1770, Ak 2: 385–419]

MFNS *Metaphysical Foundations of Natural Science.* Trans. M. Friedman. Cambridge: Cambridge University Press, 2004. [1786, Ak 4: 465–565]

Prol *Prolegomena to Any Future Metaphysics*. Trans. G. Hatfield. Cambridge: Cambridge University Press, 2004. [1783, Ak 4: 253–383]

R *Reflexionen,* aka *Kants handschriftlicher Nachlass.* Selections in *Notes and Fragments*. Trans. C. Bowman, P. Guyer, and F. Rauscher. Cambridge: Cambridge University Press, 2005.

TPP "Toward Perpetual Peace." Trans. M. Gregor. In I. Kant, *Immanuel Kant: Practical Philosophy.* Cambridge: Cambridge University Press, 1996. pp. 317–351. [1795, Ak 8: 341–386]

Acknowledgments

A version of Chap. 1 was presented at LMU Munich in December 2022.

Chapters 3, 6, and 7 are based, respectively, on these three previously published articles:

"Physics For Humans: Kant, Natural Science, and The Neo-Aristotelian Natural Power Grid." *Revue romaine de philosophie* 66 (2022): 197–216. Also available online at URL = http://www.institutuldefilosofie.ro/page.php?146.

"How to Complete Quantum Mechanics, Or, What It's Like To Be A Naturally Creative Bohmian Beable." *Journal of Philosophical Investigations* 15 (Autumn 2021): 53–71. Available online at URL = https://philosophy.tabrizu.ac.ir/article_13839.html?lang=en.

"Can Physics Explain Physics? Anthropic Principles and Transcendental Idealism." In L. Caranti (ed.), *Kant and the Problem of Knowledge in the Contemporary World.* London: Routledge, 2022. pp. 136–145.

And an earlier version of section 3.2 also appeared in the now-discontinued online journal *Critique* in 2018, under the title "Kant's Neo-Aristotelian Natural Power Grid: On *Kant and the Laws of Nature*."

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Contents

Chapter 1
Introduction

Abstract In this introductory chapter, against the backdrop of the contemporary crisis in the formal-&-natural sciences, and the three basic problems that jointly constitute that crisis, I briefly describe the purpose of this book, which is to solve these three basic problems by presenting and defending what I call *the neo-organicist turn*, including *manifest realism* and the three sub-parts of *organicism*: *liberal naturalism*, *mind-life continuity*, and *explanatory inversion*, i.e., the dependency of the mechanical on the organic. Or more briefly and simply put, the purpose of this book is to present and defend *science for humans*. Science for humans is an original and paradigm-shifting conception of formal science, natural science, and the natural universe alike.

> Up to now it has been assumed that all our cognition must conform to the objects; but all attempts to find out something about them a priori through concepts that would extend our cognition have, on this presupposition, come to nothing. Hence let us once try whether we do not get farther with the problems of metaphysics by assuming that the objects must conform to our cognition, which would agree better with the requested possibility of an a priori cognition of them, which is to establish something about objects before they are given to us. This would be just like the first thoughts of Copernicus, who, when he did not make good progress in the explanation of the celestial motions if he assumed that the entire celestial host revolves around the observer, tried to see if he might not have better success if he made the observer revolve and left the stars at rest. (*CPR* Bxvi)

> To sum up, we may say that the characteristic feature of the actual development of the system of theoretical physics is an ever extending emancipation from the anthropomorphic elements, which has for its object the most complete separation possible of the system of physics and the individual personality of the physicist. One may call this the objectiveness of the system of physics. In order to exclude the possibility of any misunderstanding, I wish to emphasize particularly that we have here to do, not with an absolute separation of physics from the physicist—for a physics without the physicist is unthinkable—but with the elimination of the individuality of the particular physicist and therefore with the production of a common system of physics for all physicists….

> [E]ach great physical idea means a further advance toward the emancipation from anthropomorphic ideas. This was true in the passage from the Ptolemaic to the Copernican cosmical system, just as it is true at the present time for the apparently impending passage from the so-called classical mechanics of mass points to the general dynamics originating in the

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> principle of relativity. In accordance with this, man and the earth upon which he dwells are removed from the centre of the world. It may be predicted that in this century the idea of time will be divested of the absolute character with which men have been accustomed to endow it. …
>
> In the definition of irreversibility, as well as in that of entropy, reference is made to the possibility of carrying out in nature certain changes, and this means, fundamentally, nothing more than that the division of physical processes is made dependent upon the manipulative skill of man in the art of experimentation, which certainly does not always remain at a fixed stage, but is continually being more and more perfected. If, therefore, the distinction between reversible and irreversible processes is actually to have a lasting significance for all times, it must be essentially broadened and made independent of any reference to the capacities of mankind.
>
> [T]he essential, and therefore the final division of all processes occurring in nature, is into reversible and irreversible processes, and the characteristic difference between these two kinds of processes, as I have further separated them, is that in irreversible processes the entropy increases, while in all reversible processes it remains constant…. Since in nature the entropy can only increase, it follows that the state of a physical configuration which is completely isolated, and in which the entropy of the system possesses an absolute maximum, is necessarily a state of stable equilibrium, since for it no further change is possible.
>
> [W]ith the aid of the calculus of probability and with the introduction of the hypothesis of elementary disorder, we have seen that all irreversible processes may be considered as reversible elementary processes: in other words, that irreversibility does not depend upon an elementary property of a physical process, but rather depends upon the ensemble of numerous disordered elementary processes of the same kind, each one of which individually is completely reversible, and upon the introduction of the macroscopic method of treatment. From this standpoint one can say quite correctly that in the final analysis all processes in nature are reversible. (Planck, 1915: pp. 15–16, 34–35, and 134)

The two fundamental aims of science are, **first**, the discovery of truths and the achievement of knowledge about the natural universe, including ourselves—i.e., rational, but also "human, all-too-human" (i.e., finite, fallible, and thoroughly normatively imperfect in every other way too) minded animals—and our social institutions, and **second**, the construction of an organized, systematized, and (at least ideally) unified body of such knowledge. All science is theoretically driven from the top down by *formal science* (especially logic and mathematics), and also theoretically driven from the bottom up by *natural science* (especially physics, chemistry, and biology). In this book, I present and defend an original and paradigm-shifting conception of formal science, natural science, and the natural universe alike, that's fully pro-science *and* pro-humankind, but also at the same time neither theological or God-centered, nor solipsistic or self-centered, nor communitarian or social-institution-centered, nor scientistic or science-valorizing, nor materialist/physicalist or reductive, nor—above all—mechanistic. Let me briefly explain how and why this is the case, before proceeding to the fifteen chapters that follow this introductory chapter.

Nicolaus Copernicus's sixteenth and seventeenth century scientific revolution said that instead of naively assuming that humanity occupies the central place in the

natural universe, as per Ptolemaic cosmology, we postulate that humanity's Earth-based home be displaced away from the cosmological center and made relative to circular or elliptical (Keplerian) motion around the sun. Immanuel Kant's eighteenth century "Copernican Revolution" in epistemology and metaphysics in the *Critique of Pure Reason* (1781/1787), explicitly building on Copernicus's Gestalt-shifting scientific revolution, said that instead of assuming that our rational, conceptual, and sensible (i.e., perceptual, imaginational, and memory-based) human cognitive capacities passively conform either to mind-independent, noumenal objects, as per classical Rationalism, or to subjective, mind-dependent, phenomenal objects, as per classical Empiricism, we postulate instead that the manifestly real world of objective veridical appearances necessarily conforms to the innately-specified structures of our rational, conceptual, and sensible human cognitive capacities. And the early twentieth century scientific revolution carried out by The Special Theory of Relativity and The General Theory of Relativity, together with Quantum Mechanics (or for short, STR-GTR/QM), following on from the nineteenth century neo-Kantian tradition, said that space, time, matter, energy, and causation necessarily conform to—are relativized to—the properties of experimental detection-devices and measuring devices, as used by scientific experimenters or observers (e.g., clocks, light-signal-sensitive equipment like cameras, measuring rods, the Michelson interferometer, microscopes, telescopes, particle-tracking and wave-tracking equipment including single-slit devices, two-slit devices, the Mach-Zehnder interferometer, and so-on, weigh-scales of various kinds, etc.), and also introduced *the mechanistic worldview*, which makes everything in the natural universe metaphysically dependent on fundamentally physical facts and properties, and on *formal*—i.e., Turing-computable, decidable (Boolos & Jeffrey, 1989)—mechanical systems and/or *natural* mechanical systems, and also—as Max Planck rightly points out—*dehumanizes* physics:

> To sum up, we may say that the characteristic feature of the actual development of the system of theoretical physics is an ever extending emancipation from the anthropomorphic elements, which has for its object the most complete separation possible of the system of physics and the individual personality of the physicist. One may call this the objectiveness of the system of physics….
>
> [E]ach great physical idea means a further advance toward the emancipation from anthropomorphic ideas. This was true in the passage from the Ptolemaic to the Copernican cosmical system, just as it is true at the present time for the apparently impending passage from the so-called classical mechanics of mass points to the general dynamics originating in the principle of relativity. In accordance with this, man and the earth upon which he dwells are removed from the centre of the world. It may be predicted that in this century the idea of time will be divested of the absolute character with which men have been accustomed to endow it. (Planck, 1915: pp. 15–16)

At the same time, however, and in fact inconsistently, Planck also holds that

> [i]n order to exclude the possibility of any misunderstanding, I wish to emphasize particularly that we have here to do, not with an absolute separation of physics from the physicist—for a physics without the physicist is unthinkable,—but with the elimination of the individuality of the particular physicist and therefore with the production of a common system of physics for all physicists. (Planck, 1915: p. 14)

For even if the physicist were *an alien*, and not specifically *human*, they'd also have to be a rational, concept-using, conscious, self-conscious, sense-perceiving, imagining, and remembering *minded animal* alien, and so STR-GTR's/QM's dehumanization of physics *wouldn't* escape at least the necessary conformity of physics to the physicist.

Moreover, the STR-GTR/QM revolution, for all its theoretical and social-institutional success, and indeed hegemony, nevertheless remains fully impaled on the horns of a nineteenth century neo-Kantian and Vienna Circle Logical Empiricist/Positivist philosophical dilemma: EITHER formal and natural science capture a godlike or superhuman noumenal insight into humanly-inaccessible hidden reality, OR formal and natural science express only a skeptically-inflected, relativistic, subjective idealist (whether solipsistic or communitarian) construction of a phenomenal world of falsidical appearances. And never the twain shall meet. This is also what Steven L. Goldman aptly calls the *science wars* (Goldman, 2022). Let's call that *problem A*.

Furthermore, ultimately, STR-GTR/QM cannot explain manifestly real *organismic life*, *conscious mind*, *negentropy*, *irreversible processes*, and *unidirectional or asymmetric time*, except by appealing to *random fluctuations* in a Boltzmannian universal probabilistic or statistical indeterministic micro-world of atomic particles, energy quanta, and waves, and their micro-states. In particular, because "all irreversible processes may be considered as reversible elementary processes," then "in the final analysis all processes in nature are reversible" (Planck, 1915: p. 134). In short, irreversible processes are ultimately *explained away*. And the same ultimate explaining-away goes, mutatis mutandis, for life, mind, negentropy, and unidirectional or asymmetric time. But precisely *what* are "random fluctuations" and how are relevantly different from what Isaac Newton called "occult qualities"? In my opinion, they're *not* relevantly different. So the explanation-by-explaining away is grounded on a *metaphysical mystery*. Let's call all that *problem B*.

Nor, finally, can STR-GTR/QM actually unify STR-GTR and QM themselves into a single consistent and complete theory. For example, it's entirely unclear how *gravitational force*, as modeled by curved four-dimensional spacetime around large material objects—such as planets—in GTR, as the weakest of the four fundamental forces, (i) applies to the paradigmatic quantum-mechanical items—particles, waves, and energy quanta—that can be either massless (i.e., gluons and photons) or whose masses, densities, and weights can be virtually infinitely small, and (ii) applies at the center of a black hole, where spacetime curvature can be virtually infinitely great. Let's call that *problem C*.

Now, in the third decade of the twenty-first century, roughly a century after the hegemonic but nowadays troubled and even crisis-ridden (Smolin, 2013; Hossenfelder, 2018) STR-GTR/QM revolution, enter *the neo-organicist turn*, which has two parts.

First, *manifest realism*, which says that the natural universe is, at least in principle, *directly accessible* to rational human pure or a priori intuition and human sense perception alike, precisely because the natural universe consists of a complete, unified, structuralist system of *objective veridical appearances*, such that

anything X appears to be F (or G, or whatever) to us if and only if (i) X *really and truly is* F (or G, or whatever), and (ii) the fact of X's being F (or G, or whatever) is, at least in principle, *intersubjectively directly accessible* to all actual or possible rational human minded animals, and *not* idiosyncratically restricted to any single rational human individual or to any particular rational human community/social institution or special set of such communities/social institutions.

And **second**, *organicism*, which says (i) that mental properties are at least as fundamental as physical properties in the natural universe, that they don't exclude each other in the same substances, and indeed that they're *necessarily complementary* in minded animals (liberal naturalism), (ii) that conscious mind and organismic life are metaphysically continuous with one another (mind-life continuity), and (iii) that instead of assuming that the world is fundamentally mechanical, so that manifestly real conscious mind, organismic life, negentropy, irreversible processes, and unidirectional or asymmetric time all explanatorily and metaphysically mysteriously *pop out of* fundamentally physical, non-living, computable, entropic, and reversible mechanical systems, only in order ultimately to *pop back into them* in the state of maximum entropy, we instead postulate the natural universe is *fundamentally organic* and therefore all formal and natural mechanical systems are metaphysically dependent on and derivable from uncomputable, negentropic, irreversible, processual, purposive, self-organizing, and time-unidirectional or time-asymmetric organic systems (explanatory inversion).

According to organicism, then, what is the explanatory and metaphysical or ontological function of mechanical systems? It's nothing more and nothing less than to provide a relatively fixed, rigid, and static *skeleton* for channelling, distributing, focusing, framing, and more generally supporting the essentially richer informational or representational and causal powers of organic systems, just as the relatively fixed, rigid, and static skeleton inside a living animal channels, distributes, focuses, frames, and more generally supports the essentially richer informational or representational and causal powers of the organism itself. And when formal or natural organic systems fully unfold, naturally die, or otherwise creatively realize themselves and achieve closure, then the skeletons of their embedded mechanical systems continue to exist, either in a state of computable, decidable, recursive, and yet creatively inert formal perfection or else in a state in a state of calcified or frozen thermodynamic energy dispersal and equilibrium, i.e., *heat-death*. Therefore, trying to explain or construct organic systems from mechanical systems is *like confusing living animals with their skeletons*. To be sure, paleontologists can learn a great deal about living animals from the genetic information stored in skeletons.[1] But as someone who, as a university student, had a regular summer job working in a zoo, I can personally confirm that there's a world of difference between being in the same cage with a living lion, and being in the same cage with its skeleton, even though they share the same DNA.

[1] I'm grateful to one of the anonymous readers at Springer Nature for reminding me of this fact, and suggesting that I finesse my skeleton metaphor accordingly.

Manifest realism solves problem A, because it defines formal and natural scientific objectivity in such a way as to avoid noumenal realism and subjective idealism alike.

And organicism solves problem B, because it provides a natural and fully non-reductive explanation of manifestly real conscious mind, organismic life, negentropy, irreversible processes, and unidirectional or asymmetric time alike, while *also* effectively explaining the existence and specific character of formal and natural mechanical systems.

Furthermore, when taken together, as jointly constituting *neo-organicism* (NO), manifest realism and organicism collectively solve problem C, as follows.

On the negative side, NO fully avoids what I call *The Representation →Represented Fallacy*, committed by STR-GTR and QM alike, which consists in mistakenly inferring directly from the representational and quantitative properties of experimental devices, to objective properties of what's represented and measured by those devices. Correspondingly, NO rejects Einstein's postulation of *the speed of light*, i.e., 186,000 miles per second, as an absolute causal speed limit in the natural universe, in favor of the thesis that there's pervasive non-local causality in the natural universe via complementarity and entanglement. Moreover, on the one hand, NO rejects Einstein's spinozistic classical *macro-determinism*. But on the other hand, NO equally rejects the non-classical Boltzmannian universal probabilistic or statistical *indeterminism* of atomic particles, energy quanta, and waves, and their *micro-states*. Relatedly, as Einstein famously remarked, God doesn't play dice with the universe; but that's only because *God, and God's noumenal, dehumanizing standpoint, doesn't play ANY sort of substantive role in neo-organicist physics,* which resolutely focuses on the standpoint of *rational "human, all-too human" minded animals*.

On the positive side, NO postulates the fundamental and manifestly real existence of *non-deterministic* and also *non-indeterministic* uncomputable, negentropic, irreversible, processual, purposive, self-organizing, and time-unidirectional or time-asymmetric organic systems. Furthermore, NO adopts what I call *the no-layered scalar dynamic world-picture* of the manifestly real natural universe, which says (i) that the cosmos has three basic scales: *mega-* (i.e., very large-sized) scale, *meso-* (i.e., middle-sized) scale, and *micro-* (i.e., very small-sized) scale, all of which are calibrated solely by reference to the egocentrically-centered, spatiotemporally orientable, embedded standpoint of rational "human, all-too-human" minded animals, and (ii) that complementarity, entanglement, and non-locality pervade manifest natural reality at *all* basic scales. In turn, and finally, NO also postulates the fundamental and manifestly real existence of what I call *the rubber sheet cosmos*: an infinite, expanding, unbounded, torus-shaped natural universe in which all organic systems and their dependent, derivative mechanical systems are fully embedded, at all basic scales.

The purpose of this book, then, is to present and defend the neo-organicist turn, including manifest realism and the three sub-parts of organicism: liberal naturalism, mind-life continuity, and explanatory inversion. Or more briefly and simply put, the purpose of this book is to present and defend *science for humans*.

In the first paragraph of this chapter, I said that "in this book, I present and defend an original and paradigm-shifting conception of formal science, natural science, and the natural universe alike." I meant—*in a contemporary context*, roughly a century after the world-changing but now problem-ridden, crisis-beset STR-GTR/QM revolution. To be sure, there are many important influences on science for humans that flow from earlier works by brilliant philosophers and formal or natural scientists, especially including: Kant's *Critique of Pure Reason* and *Critique of the Power of Judgment* (Kant, *CPR*, *CPJFI*); some of F.W.J. Schelling's writings (see, e.g., Gare, 2011); some of Georg Cantor's mathematical writings (Cantor, 1891, 2019); Henri Bergson's *Matter and Memory* (Bergson, 1911a) and *Creative Evolution* (Bergson, 1911b/1944); A.N. Whitehead's *The Concept of Nature* (Whitehead, 1920/1971), *Science and the Modern World* (Whitehead, 1927/1967), and *Process and Reality* (1929/1978); some of Kurt Gödel's logico-mathematical writings (Gödel, 1931/1967, 1947); Erwin Schrödinger's *What is Life?* (Schrödinger, 1944/1967); Edmund Husserl's *Crisis of European Sciences* (Husserl, 1954/1970); Maurice Merleau-Ponty's *Phenomenology of Perception* (Merleau-Ponty, 1945/1962); Ilya Prigogine's *End of Certainty* (Prigogine, 1997); Thomas Nagel's *Mind and Cosmos* (Nagel, 2012); and Lee Smolin's *Time Reborn* (Smolin, 2013). These are the giants on whose shoulders I'm standing, trying to see further than they did (Newton, 1675).

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Chapter 2
Mind Is a Form of Animal Life: The Essential Embodiment Theory Now

Abstract In this chapter, I do four things. First, I briefly and compactly re-present and re-motivate what Michelle Maiese and I, in (Hanna R, Maiese M, Embodied minds in action. Oxford University Press, Oxford, 2009), call *the essential embodiment theory* of the mind-body relation and mental causation (Sect. 2.2). Second, I equally briefly and compactly present and motivate three later significant elaborations and extensions of the essential embodiment theory: (i) an original and paradigm-shifting theory of free agency that I call *natural libertarianism,* (ii) a correspondingly original and paradigm-shifting conception of nature and the formal and natural sciences that I call *the neo-organicist worldview*, and, as directly entailed by the neo-organicist worldview, (iii) the metaphysical doctrine of *liberal naturalism* (Sect. 2.3). Third, I even more briefly and compactly critically compare-&-contrast the essential embodiment theory with an increasingly popular contemporary theory of the mind-body relation that's commonly known as *Analytic panpsychism* (Sect. 2.4). And fourth and finally, I conclude the chapter with something I call *a semi-autobiographical quasi-Whiteheadian postscript* (Sect. 2.5).

> It is never our objective [and fundamentally physical and mechanical] body that we move, but our phenomenal [and fundamentally living and organic] body, and there is no mystery in that, since our body, as the potentiality of this or that part of the world, surges towards objects to be grasped and perceives them. (Merleau-Ponty, 1945/1962: p. 106; square-bracketed material added)

> [S]omeone who wishes to maintain that the brain state and the pain are identical must argue that the pain A could not have existed without a quite specific kind of configuration of molecules. If A = B, then the identity of A with B is necessary, and any essential property of one must be an essential property of the other…. In sum, the correspondence between a brain state and a mental state seems to have an obvious element of contingency…. Here I have been emphasizing the possibility, or apparent possibility, of a physical state without the corresponding mental state. The reverse possibility, the mental state (pain) without the physical state (C-fiber stimulation) also presents problems for the [mind-brain] identity theorists which cannot be resolved by appeal to the analogy of heat and molecular motion. (Kripke, 1972/1980: 147–148, 154)

The Necker Cube Argument.

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1. Our conscious visual perceptions of the two enantiomorphic, or mirror-image-reversed, representations of the Necker Cube—call them *the subjective experience of Necker aspect A* and *the subjective experience of Necker aspect B* respectively—occur spontaneously.
2. Now suppose that in the actual world brain state α partially embodies the subjective experience of Necker aspect *A*. It is … conceivable and therefore logically possible …, assuming that all physical properties in the natural world, including functional and behavioral properties, are held fixed, that brain state α might have partially embodied the subjective experience of Necker aspect *B*.
3. So mental properties do not logically strongly globally supervene on fundamental physical properties.
4. Therefore both explanatory reduction and ontological reduction are false, and PIM [i.e., the physical irreducibility of the mental] is true. (Hanna & Maiese, 2009: p. 281, square-bracketed material added)

2.1 Introduction

Fifteen years ago, Michelle Maiese and I published a 400-page book in the philosophy of mind with Oxford University Press, called *Embodied Minds in Action* (Hanna & Maiese, 2009). In that book, we worked out what we thought was—and still continue to think is—an original and paradigm-shifting theory of the mind-body relation and mental causation.

Sadly, however, like David Hume's *Treatise of Human Nature*, our book "fell *dead-born from the press*, without reaching such distinction, as even to excite a murmur among the zealots" (Hume, 1776/2022: p. 6). In other words, it was completely ignored by the leading mainstream Analytic philosophers of mind—including David Chalmers, Andy Clark, Daniel Dennett, Jaegwon Kim, and John Searle—not to mention also being completely ignored by all *other* philosophers, whether Analytic philosophers or so-called "Continental" philosophers. One minor exception was a short review by a young and relatively unknown Analytic philosopher of mind, who merely described its basic contents and then said that the book was "highly ambitious," which is an Analytic philosopher's dog-whistle or coded speech for "not to be taken seriously; safely ignored." A second minor exception was another young, but also more professionally ambitious and nowadays better-known, mainstream Analytic philosopher of mind, who wrote in his personal blog at the time that *he was "amazed" that this book was actually published by OUP, since he literally didn't understand a single word of it, especially all that long-discredited Kantian stuff.* Really? Not a single word? Not even the title? And what's so bad about Kantian philosophy anyway? But over and above the all-too-familiar anti-Kantian dogmatism and prejudice that's characteristic of what I've called "the Kant wars" (Hanna, 2020a), and in order to be rationally extra-charitable to the blogger, one could, I suppose, from a mainstream Analytic philosophy of mind point of view, be officially "amazed" at OUP's audacity, or temporary idiocy, in

actually publishing a book that creatively and critically updates, re-works, and re-deploys Kant's "highly ambitious" cognitive semantics and transcendental idealist modal metaphysics in the *Critique of Pure Reason* (Hanna, 2001, 2006a), for the specific purpose of rethinking the foundations of the philosophy of mind. What a scandal.

In a more upbeat spirit, however, also circa 2009, by way of a third and last minor exception, some advanced graduate students at a university somewhere in the American South, who were doing a self-directed study group on *Embodied Minds in Action*, wrote that a super-short but accurate synopsis of the book would be:

Merleau-Ponty Meets The Kripke Monster

and I've always liked that witty microsynopsis of our book. Indeed, there's definitely something bang-on-target correct about it, *methodologically* speaking, in that it's absolutely true that *Embodied Minds in Action* combines (i) a set of thoroughly non-reductive existential-phenomenological descriptions and also (ii) a substantive appeal to evidence supplied by contemporary empirical psychology, both as per Maurice Merleau-Ponty in his 1945 masterpiece, *The Phenomenology of Perception*, together with (iii) the formally rigorous logico-semantic methods of contemporary Analytic modal metaphysics, as per Saul Kripke in his 1972 masterpiece, *Naming and Necessity*. So we methodologically triangulate phenomenology, empirical psychology, and modal metaphysics. And then (iv) they're all philosophically distilled, refined, and transmogrified in the alembic of a broadly Kantian approach to cognitive semantics and transcendental modal metaphysics that's directly inspired by Kant's 1781 masterpiece, the first *Critique*. So we *methodologically triangulate* and then *kantify*.

An excellent example of this triangulation-&-kantification method is our *Necker Cube Argument* for the physical irreducibility of the mental, as per the third epigraph for this chapter and the image displayed directly below it (see Fig. 2.1 above), which utilizes (i) the phenomenology of multistable perception, (ii) the empirical psychology of multistable perception, (iii) a priori conceptual modal reasoning, and (iv) Kant's famous "incongruent counterparts" argument for the essential

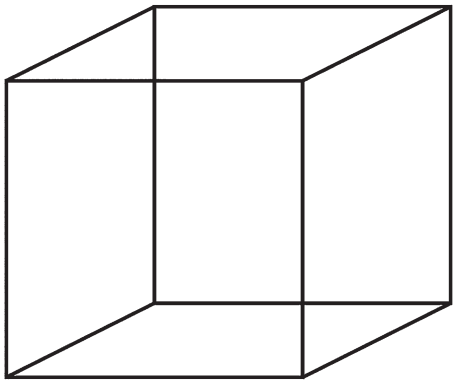

Fig. 2.1 The Necker Cube. (Wikimedia Commons, 2007)