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A landscape of consciousness: Toward a taxonomy of explanations and implications

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ABSTRACT

Diverse explanations or theories of consciousness are arrayed on a roughly physicalist-to-nonphysicalist landscape of essences and mechanisms. Categories: Materialism Theories (philosophical, neurobiological, electromagnetic field, computational and informational, homeostatic and affective, embodied and enactive, relational, representational, language, phylogenetic evolution); Non-Reductive Physicalism; Quantum Theories; Integrated Information Theory; Panpsychisms; Monisms; Dualisms; Idealisms; Anomalous and Altered States Theories; Challenge Theories. There are many subcategories, especially for Materialism Theories. Each explanation is self-described by its adherents, critique is minimal and only for clarification, and there is no attempt to adjudicate among theories. The implications of consciousness explanations or theories are assessed with respect to four questions: meaning/purpose/value (if any); AI consciousness; virtual immortality; and survival beyond death. A Landscape of Consciousness, I suggest, offers perspective.

Explanations of consciousness abound and the radical diversity of theories is telling. Explanations, or theories, are said to work at astonishingly divergent orders of magnitude and putative realms of reality. My purpose here must be humble: collect and categorize, not assess and adjudicate.[1] Seek insights, not answers.

Unrealistically, I'd like to get them all, at least all contemporary theories that are sufficiently distinct with explanations that can surmount an arbitrary hurdle of rationality or conceivability.[2] Falsification or verification is not on the agenda. I'm less concerned about the ontological truth of explanations/theories[3] than in identifying them and then locating them on a "Landscape"[4] to enable categorization and assess relationships. Next, I assess implications of categories for "big questions." Thus, this Landscape is not about how consciousness is measured or evolved or even works, but about what consciousness *is* and what difference it makes.

It's the classic "mind-body problem:" How do the felt experiences in our minds relate to the neural processes in our brains? How do mental states, whether sensory, cognitive, emotional, or even noumenal (self-less) awareness, correlate with brain states? The Landscape of Consciousness explanations or theories I want to draw is as broad as possible, including those that cannot be subsumed by, and possibly not even accessed by, the scientific method. This freedom from constraint, as it were, is no excuse for wooly thinking. Standards of rationality and clarity of argument must be maintained even more tenaciously, and bases of beliefs must be specified even more clearly.

I have two main aims: (i) gather and describe the various theories

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[1] Feedback is appreciated, especially explanations or theories of consciousness not included, or not described accurately, or not classified properly; also, modifications of the classification typology. "A Landscape of Consciousness" is a work-in-progress, permanently.

[2] I make no attempt to be exhaustive historically: while Bohm, Jung, Aquinas, Aurobindo, and *Dao De Jing* are included; Plato, the Psalmist, Nagarjuna, Confucius, and the Apostle Paul are not.

[3] I use "explanation" and "theory" interchangeably, though I chose "explanations," not "theories," for the subtitle. "Theories" range from the "Theory of Relativity" with high precision, to theories in the life and social sciences with confidence levels that vary wildly, to "I have a theory" (meaning "I have an idea," about anything, say, why my favorite sports team keeps losing). Other terms are "hypothesis," an initial idea to guide research, and "model," a simplification of the real world to isolate and test insights. All these terms have precise definitions in the literature (see Daniel Stoljar, Kind and Stoljar, 2023, pp. 112–113). But on this Landscape everyone picks their own term. Most pick "theory," in part because they really believe their baby is beautiful. No matter the term, we are all after the same goal: the foundation(s) of consciousness.

[4] Deliberately, "A Landscape …." *not* "The Landscape …." I acknowledge, with pleasure, precedent to Leonard Susskind's pioneering *The Cosmic Landscape* (string theory structures and the anthropic principle).

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and array them in some kind of meaningful structure of high-level or first-order categories (and under Materialism, subcategories); and (ii) assess their implications, with respect to four big questions: meaning/purpose/value (if any); artificial intelligence (AI) consciousness; virtual immortality; and survival beyond death.

Theories overlap; some work together. Moreover, while a real-world landscape of consciousness, even simplified, would be drawn with three dimensions (at least), with multiple kinds and levels of nestings—a combinatorial explosion (and likely no closer to truth)—I satisfice with a one-dimensional toy-model. I array all the theories on a linear spectrum, simplistically and roughly, from the "most physical" on the left (at the beginning) to the "least physical" on the right (near the end).[5] (I have two final categories after this spectrum.) The physicalism assumed in Materialism Theories of consciousness is characterized by naturalistic, science-based perspectives, while non-materialism theories have various degrees of nonphysicalist perspectives outside the ambit of current science and in some cases not subject to the scientific method of experimentation and replicability.

Please do not ascribe the relative importance of a theory to the relative size of its description. The shortest can be the strongest. It sometimes takes more words to describe lesser-known theories. For each description I feel the tension between conciseness and completeness. Moreover, several are not complete theories in themselves but ways to think about consciousness that strike me as original and perhaps insightful.

I have followed consciousness studies in its various forms for my entire life. My PhD is in neurophysiology (thalamocortical evoked potentials).[6] I am creator and host of *Closer To Truth*,[7] the long-running public television series and web resource on science and philosophy, roughly one-third of which focuses on consciousness and brain/mind topics.[8] I have discussed consciousness with over 200 scientists and philosophers who work on or think about consciousness and related fields (Closer To Truth YouTube; Closer To Truth website).[9]

I use these *Closer To Truth* discussions as resources. I want to give feel and flavor, as well as propositions and arguments, for the astonishingly diverse attitudes and approaches to consciousness coming from radically diverse perspectives and worldviews. That's why I use spontaneous quotes from verbal conversations along with meticulous quotes from academic papers.

In one early *Closer To Truth* episode, "What are the Big Questions of Science," philosopher Patricia Churchland gave the bluntest answer: "Out of meat, how do you get thought? That's the grandest question." She distinguishes two major questions. One is whether psychological states—our mental life of remembering, thinking, creating—are really a subset of brain activity? The other is how do high-level psychological processes come about from basic neurophysiological actions? "How do brain cells, organized in their complex ways, give rise to my watching something move, or seeing color, or smelling a rose"(Churchland, 2000; Kuhn, 2000a, 2000b).

Philosopher David Papineau distinguishes three questions related to consciousness: *How?*, *Where?*, and *What?* "First, *how* does consciousness relate to other features of reality? Second, *where* are conscious phenomena located in reality? And, third, *what* is the nature of consciousness?" (Papineau, 2020a). Because this Landscape is structured by theories of consciousness, not by philosophical questions, each theory sets its own agenda for dealing with the three questions, mostly, of course, focusing on the *How?*

Philosopher Thomas Nagel sees more a fundamental conundrum and he frames it crisply. "We have at present no conception of how a single event or thing could have both physical or phenomenological aspects, or how if it did they could be related" (Nagel, 1986). In his influential paper, "What Is It Like to Be a Bat?," Nagel offers, "Without consciousness the mind-body problem would be much less interesting. With consciousness it seems hopeless" (Nagel, 1974).

"Hopeless," to me, is invigorating; I'm up for the "hopeless challenge." Take all that follows as my personal journey of consciousness; idiosyncratic, to be sure; not all for everyone, not set in cement.

1. Chalmers's "hard problem" of consciousness

Philosopher David Chalmers famously characterized the core conundrum of explaining consciousness—accounting for "qualia," our qualitatively rendered interior experience of motion-picture-like perception and cognitive awareness—by memorializing the pithy, potent phrase, "the hard problem." This is where most contemporary theories commence and well they should (Section: Chalmers, 1995b, 1996, 2007; 2014a; 2014b; 2016b).

It is no exaggeration to say that Chalmer's 1995 paper, "Facing up to the problem of consciousness" (Chalmers, 1995b) and his 1996 book, *The Conscious Mind: In Search of a Fundamental Theory* (Chalmers, 1996), were watershed moments in consciousness studies, challenging the conventional wisdom of the prevailing materialist-reductionist worldview and altering the dynamics of the field. His core argument against materialism, in its original form, is deceptively (and delightfully) simple:

1. In our world, there are conscious experiences.
2. There is a logically possible world physically identical to ours, in which the positive facts about consciousness in our world do not hold.
3. Therefore, facts about consciousness are further facts about our world, over and above the physical facts.
4. So, materialism is false.

This is the famous "Zombie Argument" (infamous to some): whether creatures absolutely identical to us in every external measure, but with no internal light, no inner subjective experience, are "conceivable"—the argument turning on the meaning and implications of "conceivable" and the difference between conceivable and possible. (It can be claimed that the Zombie Argument for consciousness being nonphysical, like the Ontological Argument for God actually existing, sneaks the conclusion into one of the premises.)

Chalmers asks, "Why does it feel like something inside? Why is our brain processing—vast neural circuits and computational mechanisms—accompanied by conscious experience? Why do we have this amazing, entertaining inner movie going on in our minds?" (All quotes not referenced are from Closer To Truth videos on www.closertotruth.com, including 2007, 2014a, 2014b, 2016b.)

Key indeed are qualia, our internal, phenomenological, felt experience—the sight of your newborn daughter, bundled up; the sound of Mahler's Second Symphony, fifth movement, choral finale; the smell of garlic, cooking in olive oil. Qualia—the felt qualities of inner experience—are the crux of the mind-body problem.

Chalmers describes qualia as "the raw sensations of experience." He says, "I see colors—reds, greens, blues—and they feel a certain way to me. I see a red rose; I hear a clarinet; I smell mothballs. All of these feel a

[5] My typology is arbitrary, and any association with political connotations of "left" and "right" is coincidental and comical.

[6] UCLA Department of Anatomy and Brain Research Institute, 1964–1968.

[7] *Closer To Truth* is co-created, produced and directed by Peter Getzels.

[8] *Closer To Truth* features over 100 TV episodes and over 1500 video interviews on consciousness and related topics, issues and questions in brain and mind, such as free will, personal identity, and alien intelligences. Closer To Truth website, www.closertotruth.com and Closer To Truth YouTube channel, www.youtube.com/@CloserToTruthTV.

[9] In addition, viewers globally send me their theories on consciousness: some are coherent, a few are original, all are passionate. I consider them all—most, admittedly, I skim—and I learn some, enriching the Landscape. There seems a sharp division: those striving to develop purely physicalist explanations (however complex), and those taking consciousness as in some sense fundamental (whether motivated by religion, parapsychology or philosophy).

certain way to me. You must experience them to know what they're like. You could provide a perfect, complete map of my brain [down to elementary particles]—what's going on when I see, hear, smell—but if I haven't seen, heard, smelled for myself, that brain map is not going to tell me about the quality of seeing red, hearing a clarinet, smelling mothballs. You must experience it."

Since qualia constitutes the core of the "hard problem," and since the hard problem has come to so dominate consciousness studies such that almost every theorist must confront it, seeking either to explain it or refute it—and since the hard problem is a leitmotiv of this Landscape—I asked Dave about its backstory.

> "I first remember presenting the hard problem in a talk at the first Tucson 'Toward a Science of Consciousness' consciousness in 1994. When did I first use it? Did I use it in writing before then? I've looked in my writing and have not found it [i.e., not prior to the 1994 talk]. The hard problem was part of the talk. I remember speaking with some students beforehand, saying I'm going to talk about 'hard problems, easy problems.' I had been already talking this way in my seminar the previous year, so maybe it was already becoming part of my thinking. But I didn't think about it as an 'insight.' I just thought it a way of stating the obvious. 'Yeah, there's a really hard problem here.' So, as part of the first couple of minutes of my talk, I said something like 'everyone knows there is a hard problem' …. And people took it and said 'it's this great insight' … Well, it did become a catchy meme; it became a way of encapsulating the problem of consciousness in a way that made it difficult to ignore, and I'm grateful for that role. I had no idea at the time that it would catch on, but it's good because the problem of consciousness is really easy to ignore or to sidestep, and having this phrase, 'the hard problem,' has made it difficult to do that. There's now just a very natural response whenever that happens. You say, 'Well, that's addressing the easy problem, but it's not addressing the hard problem.' I think this helps in getting both scientists and philosophers to take consciousness seriously. But I can't take credit for the idea. Everyone knew that consciousness was a hard problem way before me—my colleagues, Tom Nagel and Ned Block; philosophers like C.D. Broad almost 100 years ago; Thomas Huxley back in the 19th century; even Leibniz and Descartes—they all knew that consciousness was a hard problem" (Chalmers, 2016b).

Over the years, while Chalmers has played a leading role in expanding and enriching the field of consciousness studies (Chalmers, 2018), his overarching views have not changed: "I don't think the hard problem of consciousness can be solved purely in terms of neuroscience." As science journalist George Musser puts it, "By 'hard,' Chalmers meant impossible. Science as we now practice it, he argued, 'is inherently unable to explain consciousness'" (Musser, 2023a,b).

This does not mean, of course, that Chalmers is making a case for "substance dualism," some nonphysical stuff (like the immortal souls of many religions). Chalmers is postulating a "naturalistic dualism," where perhaps "information" is the connective, because while information is not material, it is embedded in the physical world. He notes, "We can also find information realized in our phenomenology." This is a "naturalistic dualism," a kind of property dualism (15.1).

To Chalmers, "It is natural to hope that there will be a materialist solution to the hard problem and a reductive explanation of consciousness, just as there have been reductive explanations of many other phenomena in many other domains. But consciousness seems to resist materialist explanation in a way that other phenomena do not." He encapsulates this resistance in three related arguments against materialism: (i) The Explanatory Argument ("explaining structure and function does not suffice to explain consciousness"); (ii) The Conceivability Argument ("it is conceivable that there be a system that is physically identical to a conscious being, but that lacks at least some of that being's conscious states"); (iii) The Knowledge Argument ("someone could know all the physical facts … and still be unable to know all the facts about consciousness") (Chalmers, 2003).

"Physicalists, of course, resist these arguments," says Philosopher Frank Jackson. "Some deny the modal and epistemic claims the arguments use as premises. They may grant (as they should) the intuitive appeal of the claim that a zombie physical duplicate of me is possible, but insist that, when one looks at the matter more closely, one can see that a zombie physical duplicate of me is not in fact possible. Any physical duplicate of me must feel pain when they stub their toe, have things look green to them on occasion, and so on" (Jackson, 2023).

Philosopher Daniel Stoljar targets the conceivability argument ("CA"). Strictly speaking, he says, "CA is an argument against the truth of physicalism. However, since it presupposes the existence of consciousness, it may be regarded also as an argument for the incompatibility of physicalism and the existence of consciousness." Stoljar's epistemic view offers a two-part response. "The first part supposes that there is a type of physical fact or property that is relevant to consciousness but of which we are ignorant." He calls this the *ignorance hypothesis*. The second part "argues that, if the ignorance hypothesis is true, CA is unpersuasive" for reasons of logic (Kind and Stoljar, 2023, pp. 92, 95).

Philosopher Yujin Nagasawa calls "The Knowledge Argument" (Jackson, 1982, 1986, 1995, 1998) "among the strongest arguments (or possibly the strongest argument) for the claim that there is [in consciousness] something beyond the physical" (Nagasawa, 2012a). Based on a thought experiment by Frank Jackson, it imagines "Mary, a brilliant scientist," who lives entirely in a black-and-white room, who acquires all physical, scientific knowledge about color—wavelengths of light in all detail—"but it seems obvious that when she comes outside her room, she learns something completely new, namely, what is like to see color." Prior to seeing the color, "she doesn't have phenomenal knowledge of conscious experience." While Jackson himself no longer endorses the argument, it is still regarded as one of the most important arguments against physicalism, though of course it has its critics (Garfield, 1996). Nagasawa, who did his PhD under Jackson, responds to critics of the argument (Nagasawa, 2010), but also offers his own objections and novel proposals (Nagasawa, 2008).

Frank Jackson himself has much of the contemporary literature on consciousness revolving around three questions. "Does the nature of conscious experience pose special problems for physicalism? Is the nature of conscious experience exhausted by functional role? Is the nature of conscious experience exhausted by the intentional contents or representational nature of the relevant kinds of mental states?" (Jackson, 1997).

To philosopher Philip Goff, there are two aspects of consciousness that give rise to the hard problem, qualitivity and subjectivity: *qualitivity* meaning that experiences involve sensory qualities, whether in real-time or via memory recall; *subjectivity* meaning that there is a subject who has those experiences, that "these experiences are for someone: there is something that it's like for me to experience that deep red." Goff argues that these two aspects of consciousness give rise to two "hard problems." While either problem would be sufficient to refute materialism, he says, the hard problem of qualitivity is more pronounced—or at least easier to argue for—because the vocabulary of the physical sciences, which tell a purely quantitative story of causal structures, cannot articulate the qualities of experience; the language of physics entails an explanatory limitation (Goff, 2021).

Philosopher Colin McGinn provides a culinary perspective: "Matter is just the wrong kind of thing to give birth to consciousness … You might as well assert, without further explanation, that numbers emerge from biscuits, or ethics from rhubarb" (McGinn, 1993).

Philosopher Jerry Fodor put the problem into what he thought would be perpetual perspective. "[We don't know], even to a first glimmer, how a brain (or anything else that is physical) could manage to be a locus of conscious experience. This … is, surely, among the ultimate metaphysical mysteries; don't bet on anybody ever solving it" (Fodor, 1998).

2. Initial thoughts

Consciousness has been a founding and primary theme of *Closer To Truth*, broadcast on PBS stations since 2000 and now a global resource on the Closer To Truth website and Closer To Truth YouTube channel. What is consciousness? What is the deep essence of consciousness? What is the deep cause of consciousness? (These are not the same question.) Again, it is the core of the mind-body problem—how thoughts in our minds and sensations of our experiences interrelate with activities in our brains.

What does the word "consciousness" mean? What is its referent? "Consciousness" has multiple definitions, which has been part of the problem in its study. There are clear categories of consciousness, uncontroversially recognized. For example, distinguishing "creature consciousness" (the somatic condition of being awake and responding to stimuli) and "mental state consciousness" (the cognitive condition of experiential engagement with the environment and oneself). More importantly, distinguishing "phenomenal consciousness" ("what it is like") and "cognitive consciousness" (Humphrey, 2023a,b) or "access consciousness"[10] (Block, 2023), which are more about function than phenomenology.

Philosopher Ned Block sees "the border between perception and cognition" as a "joint in nature," primed for exploration. He says he was drawn to this subject because of the realization that the difference between what he calls "access consciousness (cognitive access to phenomenally conscious states)" and what he calls "phenomenal consciousness (what it is like to experience)" was rooted "in a difference between perception—whether conscious or unconscious—and cognitive access to perception" (Block, 2023).

With respect to "information," it is suggested that "the word 'consciousness' conflates two different types of information-processing computations in the brain: the selection of information for global broadcasting, thus making it flexibly available for computation and report," and "the self-monitoring of those computations, leading to a subjective sense of certainty or error" (Dehaene et al., 2017). But, again, the issue is phenomenal consciousness, and to the extent that each type of consciousness comes with inner experience, the same issues obtain.

Artificial intelligence pioneer Marvin Minsky calls consciousness "a suitcase term," meaning that all sorts of separate or mildly related concepts can be packed into it. "Consciousness," he says, "is a clever trick that we use to keep from thinking about how thinking works. And what we do is we take a lot of different phenomena and we give them all the same name, and then you think you've got it." Minsky enjoys dissecting consciousness: "When people use the word 'consciousness,' it's a very strange idea that there's some wonderful property of the brain that can do so many different things—at least four or five major things and dozens of others. For example, if I ask, 'were you conscious that you touched your ear?' You might say 'no, I didn't know I did that.' You might say, 'yes.' If you say yes, it's because some part of your mind, the part that talks, has access to something that remembers what's happened recently with your arm and your ear." Minsky notes "there are hundreds of kinds of awarenesses. There's remembering something as an image. There's remembering something as a string of words. There's remembering the tactile feeling of something" (Minsky, 2007a).

Minsky says there is no harm in having consciousness as a suitcase term for social purposes. When a word has multiple meanings, that ambiguity is often very valuable, he says. "But if you're trying to understand those processes and you've put them all in one box, then you say, where in the brain is consciousness located? There's a whole community of scientists who are trying to find the place in the brain where consciousness is. But if it's 'a suitcase' and it's just a word for many different processes, they're wasting their time. They should try to find out how each of those processes works and how they're related" (Minsky, 2007a).

Philosopher Massimo Pigliucci points out that "you do not need phenomenal consciousness in order to react to the environment. Plants do it, bacteria do it, all sorts of stuff do it." But when it comes to emotion, he says, "Yes, you do need consciousness – in fact, that is what an emotion is. Emotion implies some level of internal perception of what's going on, some awareness of the phenomenal experience" (Pigliucci, 2023a,b).

Suffice it to say that the hard problem refers to phenomenal consciousness. (This is not to say, of course, that cognitive or access consciousness is an "easy problem.")

To Alex Gomez-Marin, a theoretical physicist turned behavioral neurobiologist, "Ask not what neuroscience can do for consciousness but what consciousness can do for neuroscience." He laments, "When it comes to serious proposals that offer an alternative to materialism, the mainstream has its doors wide shut … I believe the underlying issue of this debate is a tectonic clash about the nature of reality … In other words, the dominant physicalist paradigm can tolerate many things (including its own internal contradictions and empirical anomalies), but not panpsychism, idealism, dual-aspect monism, or any other view … Any nonmaterialist whiff in the consciousness hunger games is punished. Challenge the core foundations, and you shall be stigmatized; propose a cutting-edge new color to the walls of the old building, you will be cheered (Gomez-Marin, 2023).

On the other hand, philosopher Simon Blackburn cautions against overinflating consciousness as a concept. "I wouldn't try to approach it by definition," he said. "That's going to be just a can of worms. Leibniz said that if we could blow the brain up to the size of a mill and walk around in it, we still wouldn't find consciousness" (Blackburn, 2012).

To Blackburn, the hard problem is not what Chalmers says it is. "I think the really hard problem is trying to convince ourselves that this [consciousness problem] is, as it were, an artifact of a bad way of thinking. The philosopher who did the most to try to persuade us of that was Ludwig Wittgenstein; the central exhibit in his armory was a thing called the private language argument [i.e., a language understandable by only one person is incoherent]. Wittgenstein said if you think in terms of consciousness in that classical way, we meet the problem of other minds. Why should I think that you're conscious? I know that I am, but what about you? And if consciousness in some sense floats free, it might sort of just come and go all over the place. As I say, the hard problem is getting rid of the hard problem" (Blackburn, 2012).

Physicist-visionary Paul Davies disagrees. "Many scientists think that life and consciousness are just irrelevant byproducts in a universe; they're just other sorts of things. I don't like that idea. I think we're deeply significant. I've always been impressed by the fact that human beings are not only able to observe the universe, but they've also come to understand it through science and mathematics. And the fact that we can glimpse the rules on which the universe runs—we can, as it were, decode the cosmic code—seems to me to point to something of extraordinary and fundamental significance" (Davies, 2006a).

To computer scientist-philosopher Jaron Lanier, "Fundamentally, we know very little about consciousness and the process of doing science is best served by humility. So, until we can explain this subjective experience, I think we should accept it as being there" (Lanier, 2007a).

I should note that the mind-body problem is hardly the only problem in consciousness studies: there are myriad mind-related problems. Topping the list of others, perhaps, is the problem of mental causation: How can mental states affect physical states? How can thoughts make actions?

Physicist Uzi Awret argues that explaining how consciousness acts on the matter of the brain to "proclaim its existence" is just as hard as explaining how matter can give rise to consciousness. In fact, the two questions constrain each other. (For example, must panpsychists

[10] The noncognitive nature of perception precludes cognitive theories of consciousness. In particular, Block says there is an argument from one of the cases of nonconceptual perception to the conclusion that there is phenomenal consciousness without access consciousness.

consider phenomenal powers and dualists kinds of interactionism?) Awret makes the insightful point that one reason the two questions should be conjoined is that they can be complementary in the sense that explaining one makes it harder to explain the other (Awret, 2024).

Mental causation is an issue for every theory of consciousness: a serious one for Dualism, less of so for monistic theories—Materialism, Monisms, Idealisms, perhaps Panpsychism-—in that everything would be made of the same stuff. Yet, still, mental causation needs explanation. But that is not my task here.

While precise definitions of consciousness are challenging, almost everyone agrees that the real challenge is phenomenal consciousness. Phenomenal consciousness is the only consciousness in this Landscape.

3. Philosophical tensions

Two types of philosophical tensions pervade all efforts to understand consciousness: (i) epistemological versus ontological perspectives, and (ii) the nexus between correlation and causation. The former distinguishes what we can know from what really exists; they can be the same, of course, but that determination may not be a superficial one and in fact may not be possible, in practice or even in principle. The latter has an asymmetrical relationship in that causation must involve correlation whereas correlation does not necessarily involve causation; the dyadic entities that correlate might each be caused by an unknown hidden factor that just so happens to cause each of them independently.

In addition, there are questions about the phylogenetic evolution of consciousness (9.10). Is it a gradual gradient, from simple single-cells seeking homeostasis via stimulus-response to environmental pressures, relatively smoothly up the phylogenetic tree to human-level consciousness (as is conventional wisdom)? Or is consciousness more like a step-function with spurts and stops? Is there a cut-off, as it were? Others, of course, maintain that consciousness is irreducible, even fundamental and primordial.

I give "Philosophical Tensions" its own section, however short, to stress the explanatory burden of which every theory of consciousness must keep cognizant: the epistemology-ontology distinction and the correlation-causation conundrum.

4. Surveys & typologies

Philosopher Tim Bayne suggests three ways to think about what consciousness is: (i) experience, awareness and their synonyms (Nagel's "what-its-like-to-be"); (ii) paradigms and examples, using specifics to induce the general; and (iii) initial theories to circumscribe the borders of the concept, such that a more complete definition falls out of the theory. Examples of (iii) are conducting surveys and organizing typologies (see below) and constructing taxonomies (which is the intent of this paper) (Bayne, 2007).

To appreciate theories of consciousness, there are superb surveys and typologies, scientific and philosophical, that organize the diverse offerings.

David Chalmers offers that "the most important views on the metaphysics of consciousness can be divided almost exhaustively into six classes," which he labels "type A" through "type F." The first three (A through C) involve broadly reductive views, seeing consciousness as a physical process that involves no expansion of a physical ontology [Materialism Theories, 9]. The other three (D through F) involve broadly nonreductive views, on which consciousness involves something irreducible in nature, and requires expansion or reconception of a physical ontology [D = Dualism, 15; E = Epiphenomenalism, 9.1.2; F = Monism, 14] (Chalmers, 2003).

PhilPapers (David Bourget and David Chalmers, general editors) feature hundreds of papers on Theories of Consciousness, organized into six categories: Representationalism; Higher-Order Theories of Consciousness; Functionalist Theories of Consciousness; Biological Theories of Consciousness; Panpsychism; Miscellaneous Theories of Consciousness (including Eliminativism, Illusionism, Monisms, Dualism, Idealism) (Bourget and Chalmers, *PhilPapers*). In presenting a case for panpsychism, Chalmers arrays and assesses materialism, dualism and monism as well as panpsychism (Chalmers, 2016a).

Neuroscientist Anil Seth and Tim Bayne gather and summarize a wide range of candidate theories of consciousness seeking to explain the biological and physical basis of consciousness (22 theories that are essentially neurobiological) (Seth and Bayne, 2022). They review four prominent theories—higher-order theories; global workspace theories; reentry and predictive processing theories; and integrated information theory—and they assert that "the iterative development, testing and comparison of theories of consciousness will lead to a deeper understanding of this most central of mysteries." However, Seth and Bayne intensify the mystery by observing, "Notably, instead of ToCs [theories of consciousness] progressively being 'ruled out' as empirical data accumulates, they seem to be proliferating." This seems telling.

An engagingly novel kind of survey of the mind-body problem is an insightful (and delightfully idiosyncratic) book by science writer John Horgan (2018). Rejecting "hard-core materialists" who insist "it is a pseudo-problem, which vanishes once you jettison archaic concepts like 'the self' and 'free will'," Horgan states that "the mind-body problem is quite real, simple and urgent. You face it whenever you wonder who you really are." Recognizing that we can't escape our subjectivity when we try to solve the riddle of ourselves, he explores his thesis by delving into the professional and personal lives of nine mind-body experts. (He admits it is odd to offer "my subjective takes on my subjects' subjective takes on subjectivity.") (Horgan, 2019).

While greater understanding of the biological (and material) basis of consciousness will no doubt be achieved, the deeper question is whether such biological understanding will be sufficient to explain, even in principle, the essence of consciousness, *ever*. While most adherents at both ends of the Landscape of Consciousness—materialists and idealists—are confident of the ultimate vindication of their positions, others, including me, take this deeper question as remaining an open question.

My high-bar attempt here is to generate a landscape that is universally exhaustive, in that whatever the ultimate explanation of consciousness, it is somewhere, somehow, embedded in this Landscape of theories (perhaps in multiple places)—even if we have no way, now or in the foreseeable future, to discern it from its cohort Landscapees.

5. Opposing worldviews

At the highest level of abstraction, there are two ways to frame competing theories of consciousness. One way pits monism, where only one kind of stuff is fundamental (though manifest in ostensibly different forms), against dualism, where both physical and mental realms are equally fundamental, without either being reducible to the other.[11]

There are two kinds of monism, each sitting at opposite ends of the Landscape of Consciousness: at one end, materialism or physicalism,[12] where the only real things are products of, or subject to, the laws of physics, and can be accessed reliably and reproducibly only by the natural sciences; and at the other end, idealism, where only the mental is

[11] Logically, there is no necessity for dualism to be the limit; there can be innumerable kinds of irreducible "World-Stuffs"; for this Landscape, monism vs. dualism is sufficiently daunting.

[12] "Materialism" and "physicalism" are roughly equivalent ontological terms, often used interchangeably, although physicalism can cover wider territory, including properties that the laws of physics describe, e.g., space, time, energy, matter. Moreover, physicalism can connote more epistemological matters, in terms of how we can know things. Materialism can be distinguished as the more restrictive term, meaning all that is real is matter and its equivalents. It connotes more ontological concerns, in terms of what really exists. In this Landscape, we go more with "materialism," which also maintains historical continuity.

A Landscape of Consciousness - Basic Outline

Note: References in the text add "8" to the first digit of each theory.

1. MATERIALISM THEORIES
- **1.1 Philosophical Theories**
- **1.2 Neurobiological Theories**
- **1.3 Electromagnetic Field Theories**
- **1.4 Computational and Informational Theories**
- **1.5 Homeostatic and Affective Theories**
- **1.6 Embodied and Enactive Theories**
- **1.7 Relational Theories**
- **1.8 Representational Theories**
- **1.9 Language Relationships**
- **1.10 Phylogenetic Evolution**

2. NON-REDUCTIVE PHYSICALISM

3. QUANTUM THEORIES

4. INTEGRATED INFORMATION THEORY

5. PANPSYCHISMS

6. MONISMS

7. DUALISMS

8. IDEALISMS

9. ANOMALOUS AND ALTERED STATES THEORIES

10. CHALLENGE THEORIES

Fig. 1. A landscape of consciousness - basic outline.

fundamental, and all else, including all physical existence, is derivative, a manifestation of the mental. (Nondualism, from philosophical and religious traditions originating on the Indian subcontinent, avers that consciousness and only consciousness, which is cosmic, is fundamental and primitive. 16.1.)

The second way to frame opposing explanations of consciousness is simply the classic physical vs. nonphysical distinction, though certain explanations, such as panpsychism, may blur the boundary.

6. Is consciousness primitive/fundamental?

A first foundational question is whether consciousness is primitive or fundamental, meaning that it cannot be totally explained by, or "reduced" to, a deeper level of reality. ("Totally" is the operative word, because consciousness can be explained by, or reduced to, neuroscience, biology, chemistry and physics, certainly in large part, at least.)

If consciousness is primitive or fundamental, we can try to explore what this means, what alternative concepts of ultimate reality may follow—though, if this were the case, there is probably not much progress to be made.

On the other hand, if consciousness is not primitive or fundamental, there is much further work to be done and progress to be made. To begin, there are (at least) three next questions:

First, is consciousness "real," or, on the other hand, is it sufficiently an "illusion," a brain trick, as it were, which would render consternation over the conundrum moot, if not meaningless?

Second, if consciousness is real (and not primitive), then since in some sense it would be emergent, would this emergence of consciousness be "weak," meaning that in principle it could be explained by, or reduced to, more fundamental science (even if in practice, it could not be, for a long time, if ever)?

Third, if weak emergence has insufficient resources, would this emergence of consciousness be "strong," meaning that it would be forever impossible to totally explain consciousness, even in principle, by reducing it to more fundamental levels of scientific explanation (9.1.4).

Finally, is there an intermediate position, where consciousness was not fundamental ab initio, but when it evolved or emerged, consciousness came to become somehow inevitable, more than an accidental byproduct of physical processes? Some see in the grand evolution of the cosmos a process where elements in the cosmos—or more radically, the cosmos itself—work to make the cosmos increasingly self-aware (13.8).

Some founders of quantum theory famously held consciousness as fundamental. Max Planck: "I regard consciousness as fundamental. I regard matter as derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard as existing, postulates consciousness" (*The Observer*, 1931a). Erwin Schrödinger: "Although I think that life may be the result of an accident, I do not think that of consciousness. Consciousness cannot be accounted for in physical terms. For consciousness is absolutely fundamental. It cannot be accounted for in terms of anything else" (*The Observer*,

A Landscape of Consciousness - Complete Outline

Note: References in the text add "8" to the first digit of each theory.

1. MATERIALISM THEORIES

1.1 Philosophical Theories
- **1.1.1 Eliminative Materialism / Illusionism**
- **1.1.2 Epiphenomenalism**
- **1.1.3 Functionalism**
- **1.1.4 Emergence**
- **1.1.5 Mind-Brain Identity Theory**
- **1.1.6 Searle's Biological Naturalism**
- **1.1.7 Block's Biological Reductionism**
- **1.1.8 Flanagan's Constructive Naturalism**
- **1.1.9 Papineau's Mind-Brain Identity**
- **1.1.10 Goldstein's Mind-Body Problem**
- **1.1.11 Hardcastle's Argument Against Materialism Skeptics**
- **1.1.12 Stoljar's Epistemic View and Non-Standard Physicalism**

1.2. Neurobiological Theories
- **1.2.1 Edelman's Neural Darwinism and Reentrant Neural Circuitry**
- **1.2.2 Crick and Koch's Neural Correlates of Consciousness**
- **1.2.3 Baars's and Dehaene's Global Workspace Theory**
- **1.2.4 Dennett's Multiple Drafts Model**
- **1.2.5 Minsky's Society of Mind**
- **1.2.6 Graziano's Attention Schema Theory**
- **1.2.7 Prinz's Neurofunctionalism: Attention Engenders Experience**
- **1.2.8 Sapolsky's Hard Incompatibilism**
- **1.2.9 Mitchell's Free Agents**
- **1.2.10 Bach's Cortical Conductor Theory**
- **1.2.11 Brain Circuits and Cycles Theories**
- **1.2.12 Northoff's Temporo-Spatial Sentience**
- **1.2.13 Bunge's Emergent Materialism**
- **1.2.14 Hirstein's Mindmelding**

1.3 Electromagnetic Field Theories
- **1.3.1 Jones's Electromagnetic Fields**
- **1.3.2 Pockett's Conscious and Non-Conscious Patterns**
- **1.3.3 McFadden's Conscious Electromagnetic Information Theory**
- **1.3.4 Ephaptic Coupling**
- **1.3.5 Ambron's Local Field Potentials and Electromagnetic Waves**
- **1.3.6 Llinas's Mindness State of Oscillations**
- **1.3.7 Zhang's Long-Distance Light-Speed Telecommunications**

1.4 Computational and Informational Theories
- **1.4.1 Computational Theories**
- **1.4.2 Grossberg's Adaptive Resonance Theory**
- **1.4.3 Complex Adaptive Systems Models**
- **1.4.4 Critical Brain Hypothesis**

Fig. 2. A landscape of consciousness - complete outline.

1931b). Also, "The total number of minds in the universe is one. In fact, consciousness is a singularity phasing within all beings." Arthur Eddington: "when we speak of the existence of the material universe we are presupposing consciousness." (*The Observer*, 1931c). Louis de Broglie: "I regard consciousness and matter as different aspects of one and the same thing" (*The Observer*, 1931d). John von Neumann (less explicitly): "Consciousness, whatever it is, appears to be the only thing in physics that can ultimately cause this collapse or observation." John Stewart Bell: "As regards mind, I am fully convinced that it has a central place in the ultimate nature of reality" (Mollan, 2007).

Of course, consciousness as fundamental would eliminate only Materialism Theories. Compatible would be Panpsychisms, Monisms, Dualisms and Idealisms; also, some Quantum Theories and perhaps Integrated Information Theory. (But Materialism has substantial resources, 9.)

7. Identity theory

I take special interest in identity theory (Smart, 2007), not because I subscribe to the early mind-brain identity theory as originally formulated, but because its way of thinking is far more pervasive and far more elucidating than often realized (though perhaps in a way not as sanguine as some may have hoped).

In PhilPapers' Theories of Consciousness, Mind-Brain Identity Theory is classified under Biological Theories of Consciousness. Classic mind-brain identity theory is indeed the commitment that mental states/events/processes are identical to brain states/events/processes (Aranyosi, *PhilPapers*).

I would want to generalize this. I would want to say that *any* theory of consciousness, to be complete and sufficient, must make an identity claim. Bottom line, every theory of consciousness that offers itself as a total explanation, necessary if not always sufficient—other than those where consciousness is fundamental—must be a kind of identity theory.

1.4.5 Pribram's Holonomic Brain Theory
1.4.6 Doyle's Experience Recorder and Reproducer
1.4.7 Informational Realism and Emergent Information Theory
1.4.8 Mathematical Theories

1.5 Homeostatic and Affective Theories
1.5.1 Predictive Theories (Top-Down)
1.5.2 Seth's "Beast Machine" Theory
1.5.3 Damasio's Homeostatic Feelings and Emergence of Consciousness
1.5.4 Friston's Free-Energy Principle and Active Inference
1.5.5 Solm's Affect as the Hidden Spring of Consciousness
1.5.6 Carhart-Harris's Entropic Brain Hypothesis
1.5.7 Buzsáki's Neural Syntax and Self-Caused Rhythms
1.5.8 Deacon's Self-Organized Constraint and Emergence of Self
1.5.9 Pereira's Sentience
1.5.10 Mansell's Perceptual Control Theory
1.5.11 Projective Consciousness Model
1.5.12 Pepperell's Organization of Energy

1.6 Embodied and Enactive Theories
1.6.1 Embodied Cognition
1.6.2 Enactivism
1.6.3 Varela's Neurophenomenology
1.6.4 Thompson's Mind in Life
1.6.5 Frank/Gleiser/Thompson's "*The Blind Spot*"
1.6.6 Bitbol's Radical Neurophenomenology
1.6.7 Direct Perception Theory
1.6.8 Gibson's Ecological Psychology

1.7 Relational Theories
1.7.1 A. Clark's Extended Mind
1.7.2 Noë's "Out of Our Heads" Theory
1.7.3 Loorits's Structural Realism
1.7.4 Lahav's Relativistic Theory
1.7.5 Tsuchiya's Relational Approach to Consciousness
1.7.6 Jaworski's Hylomorphism
1.7.7 Process Theory

1.8 Representational Theories
1.8.1 First-Order Representationalism
1.8.2 Lamme's Recurrent Processing Theory
1.8.3 Higher-Order Theories
1.8.4 Lau's Perceptual Reality Monitoring Theory
1.8.5 LeDoux's Higher-Order Theory of Emotional Consciousness
1.8.6 Humphrey's Mental Representations and Brain Attractors
1.8.7 Metzinger's No-Self Representational Theory of Subjectivity
1.8.8 Jackson's Representationalism and the Knowledge Argument
1.8.9 Lycan's Homuncular Functionalism
1.8.10 Transparency Theory
1.8.11 Tye's Contingentism
1.8.12 Thagard's Neural Representation, Binding, Coherence, Competition
1.8.13 T. Clark's Content Hypothesis
1.8.14 Deacon's Symbolic Communication (Human Consciousness)

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Fig. 2. (*continued*).

I mean identity theory in the strong sense, in the same sense that the Morning Star and the Evening Star must both be Venus, such that if you eliminate the Morning Star you cannot have the Evening Star. (David Papineau makes a virtue of this necessity in his mind-brain identity argument for physicalism. It doesn't matter which specific materialist or physicalist theory—all of them, in essence, are mind-brain identity theories [Papineau, 2020b]—9.1.9.)

Here's the point. There is some kind of "consciousness identity" actually happening—it is always happening and it never changes. Something happening or existing in every sentient creature just *is* consciousness.

8. A landscape

As the title suggests, the purpose of this paper is to work toward developing a landscape of consciousness, a taxonomy of explanations and implications. The focus is ontological: what is the essence of our inner awareness of felt experience, our perceiving, our enjoying, what we call qualia.

To get an overall sense of the entire Landscape, I have three Figures:

Fig. 1: A high-level list of the 10 major categories, and under Materialism Theories, the 10 subcategories.
Fig. 2: A complete list of all the theories of consciousness, organized under the major categories and subcategories.

1.9 Language Relationships
1.9.1 Chomsky's Language and Consciousness
1.9.2 Searle's Language and Consciousness
1.9.3 Koch's Consciousness does not Depend on Language
1.9.4 Smith's Language as Classifier of Consciousness
1.9.5 Jaynes's Breakdown of the Bicameral Mind
1.9.6 Parrington's Language and Tool-Driven Consciousness
1.10. Phylogenetic Evolution
1.10.1 Dennett's Evolution of Minds
1.10.2 LeDoux's Deep Roots of Consciousness
1.10.3 Ginsburg and Jablonka's Associative Learning During Evolution
1.10.4 Cleeremans and Tallon-Baudry's Functional Value
1.10.5 Andrews's Consciousness Without Complex Brains
1.10.6 Reber's Cellular Basis of Consciousness
1.10.7 Feinberg and Mallatt's Ancient Origins of Consciousness
1.10.8 Levin's Technological Approach to Mind Everywhere
1.10.9 No Hard Problem in William James's Psychology
2. NON-REDUCTIVE PHYSICALISM
2.1 Ellis's Strong Emergence and Top-Down Causation
2.2 Murphy's Non-Reductive Physicalism
2.3 van Inwagen's Christian Materialism and Resurrection of the Dead
2.4 Nagasawa's Nontheoretical Physicalism
2.5 Sanfey's Abstract Realism
2.6 Northoff's Non-Reductive Neurophilosophy
3. QUANTUM THEORIES
3.1 Penrose-Hameroff's Orchestrated Objective Reduction
3.2 Stapp's Collapsing the Wave Function via Asking "Questions"
3.3 Bohm's Implicate-Explicate Order
3.4 Pylkkänen's Quantum Potential Energy and Active Information
3.5 Wolfram's Consciousness in the Ruliad
3.6 Beck-Eccles's Quantum Processes in the Synapse
3.7 Kauffman's Mind Mediating Possibles to Actuals
3.8 Torday's Cellular and Cosmic Consciousness
3.9 Smolin's Causal Theory of Views
3.10 Carr's Quantum Theory, Psi, Mental Space
3.11 Faggin's Quantum Information-based Panpsychism
3.12 Fisher's Quantum Cognition
3.13 Globus's Quantum Thermofield Brain Dynamics
3.14 Poznanski's Dynamic Organicity Theory
3.15 Quantum Consciousness Extensions
3.16 Rovelli's Relationship Physics
4. INTEGRATED INFORMATION THEORY.
4.1 Critiques of Integrated Information Theory
4.2 Koch Compares Integrated Information Theory with Panpsychism

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Fig. 2. (*continued*).

Fig. 3: A graphic image of the entire Landscape, with all categories, subcategories and theories (abbreviated) (created by Alex Gomez-Marin).
Note: Categories 1–10 in the Figures correspond to sections 9-18 in the text. To convert from categories/theories in the Figures to sections/theories in the text, add eight (+8). Conversely, to convert from sections/theories in the text to categories/theories in the Figures, subtract eight (−8).

I distinguish what consciousness is ontologically from how consciousness happens operationally. The Landscape I present is populated primarily by claims of what consciousness actually is, not how it functions and not how it evolved over deep time (although both how it functions and how it evolved may well reflect what it is). This is not a landscape of how consciousness emerged or its purpose or its content—sensations, perceptions, cognitions, emotions, language—none of these—although all of these are recruited by various explanations on offer.

Mechanisms of consciousness are relevant here only to the extent that they elucidate a core theory of consciousness. For example, the "neurogeographic" debate between the "front of the head" folks—the Global Workspace (9.2.3) and Higher-Order (9.8.3) theorists—and the "back of the head" folks—the Integrated Information (4) and Recurrent Processing (9.8.2) theorists—is essential for a complete neurobiological explanation of consciousness (Block, 2023, pp. 417–418), but it is of only mild interest for an ontological survey of the Landscape. If the Global Workplace suddenly shifted to the back of the head, and Integrated Information to the front, would the "trading-places" inversion make much ontological difference?

Traditionally and simplistically, the clash is between materialism/physicalism and dualism or idealism; such oversimplification may be part of the problem—other categories and subcategories have standing.

5. PANPSYCHISMS

5.1 Micropsychism
5.2 Panprotopsychism
5.3 Cosmopsychism
5.4 Qualia Force
5.5 Qualia Space
5.6 Chalmers's Panpsychism
5.7 Strawson's Panpsychism
5.8 Goff's Panpsychism
5.9 A. Harris's Panpsychism as Fundamental Field
5.10 Sheldrake's Self-Organizing Systems at all Levels of Complexity
5.11 Wallace's Panpsychism Inside Physics
5.12 Whitehead's Process Theory

6. MONISMS

6.1 Russellian Monism
6.2 Davidson's Anomalous Monism
6.3 Velmans's Reflexive Monism
6.4 Strawson's Realistic Monism and Real Materialism
6.5 Polkinghorne's Dual-Aspect Monism
6.6 Teilhard de Cardin's Evolving Consciousness
6.7 Atmanspacher's Dual-Aspect Monism
6.8 Ramachandran's New Physics and Neuroscience
6.9 Tegmark's State of Matter
6.10 QRI's State-Space, Qualia Formalism, Valence Realism
6.11 Bentley Hart's Monism: Consciousness, Being, God
6.12 Leslie's Consciousness Inside an Infinite Mind

7. DUALISMS

7.1 Property Dualism
7.2 Historical and Traditional Dualisms
7.3 Swinburne's Substance Dualism
7.4 Composite Dualism
7.5 Stump's Thomistic Dualism
7.6 Feser's Neo-Thomistic, Neo-Aristotelian, Common-Sense Dualism
7.7 Moreland's Christian Soul
7.8 Interactive Dualism
7.9 Emergent Dualism
7.10 Kind's Dualism 2.0
7.11 Soul in the Hebrew Bible and Jewish Philosophy
7.12 Soul in the New Testament and Christian Philosophy
7.13 Soul in Islamic Philosophy
7.14 God as the Supplier of Souls
7.15 Personal and Cosmic Consciousness in Indian Philosophy
7.16 Soul in Indigenous Religions
7.17 Realms of the Soul
7.18 Theosophy's Eclectic Soul and Consciousness
7.19 Steiner's Esoteric Soul and Consciousness
7.20 Nonphysical Component in the Human Mind

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Fig. 2. (*continued*).

The alternative theories of consciousness that follow come about via my hundreds of conversations and decades of readings and night-musings. I array 10 categories of explanations or theories of consciousness; all but one present multiple specific theories; only Materialism has subcategories. (There are many ways to envision a landscape, of course, and, as a result, many ways to array theories. I claim no privileged view.)

Here are the 10 primary categories of explanations or theories: Materialism Theories (with many subcategories); Non-Reductive Physicalism; Quantum Theories; Integrated Information Theory; Panpsychisms; Monisms; Dualisms; Idealisms; Anomalous and Altered States Theories; Challenge Theories.

It is no surprise that Materialism Theories have by far the largest number of specific theories. It is the only category with a three-level organization: there are 10 subcategories under Materialism, each housing seven to 14 specific theories. This makes sense in that there are more ways to explain consciousness with neurobiological and other physical models than with non-neurobiological and non-physical models, and also in that the challenge for materialism is to account for how the physical brain entails mental states (and there are increasingly innovative and diverse claims to do so).

There is obvious overlap among categories and among theories within categories, and it is often challenging to pick distinguishing traits to classify theories in such a one-dimensional, artificial and imposed typology. For example, one can well argue that Non-Reductive Physicalism, Quantum Theories, and perhaps even Integrated Information Theory and Panpsychisms, are all, in essence, Materialism Theories, in that they do not require anything beyond the physical world (whether in current or extended form). I break out these categories because, in recent times, each has developed a certain independence, prominence and credibility (at least in the sense of the credulity of adherents), and because they differ sufficiently from classic Materialism Theories,

8. IDEALISMS

8.1 Indian Cosmic Consciousness
8.2 Buddhism's Empty, Illusory Phenomenal Consciousness
8.3 *Dao De Jing's* Constant Dao
8.4 Kastrup's Analytic Idealism
8.5 Hoffman's Conscious Realism: The Case Against Reality
8.6 McGilchrist's Relational, Creative-Process Idealism
8.7 Chopra's Only the Whole is Conscious
8.8 How Consciousness Becomes the Physical Universe
8.9 Goswami's Self-Aware Universe
8.10 Spira's Non-Duality
8.11 Nader's All There Is
8.12 Ward's Personal Idealism: Souls as Embodied Agents Created by God
8.13 Albahari's Perennial Idealism
8.14 Meijer's Universal Knowledge Field
8.15 Idealism's Imaginative Expressions

9. ANOMALOUS AND ALTERED STATES THEORIES

9.1 Bergson's Multiplicity, Duration, Perception, Memory
9.2 Jung's Collective Unconscious and Synchronicity
9.3 Radin's Challenge to Materialism
9.4 Tart's Emergent Interactionism
9.5 Josephson's Psi-Informed Models
9.6 Wilber's Integral Theory
9.7 Combs's Chaotic Attractor and Autopoietic Systems
9.8 Schooler's Resonance Theory and Subjective Time
9.9 Sheldrake's Morphic Fields
9.10 Grinberg's Syntergic/Neuronal Field Theory
9.11 Graboi's Three-Aspect Model
9.12 Near Death Experiences, Survival, Past Lives
9.13 DOPS's Consciousness Research and Theory
9.14 Bitbol's Phenomenological Ontology
9.15 Campbell's Theory of Everything
9.16 Hiller's Eternal Discarnate Consciousness
9.17 Harp's Universal or God Consciousness
9.18 Swimme's Cosmogenesis
9.19 Langan's Cognitive-Theoretic Model of the Universe
9.20 Meditation and the Brain
9.21 Psychedelic Theories of Consciousness

10. CHALLENGE THEORIES

10.1 Nagel's Mind and Cosmos
10.2 McGinn's Ultimate Mystery (Mysterianism)
10.3 S. Harris's Mystery of Consciousness
10.4 Eagleman's Possibilianism
10.5 Tallis's Anti-Neuromania Skepticism
10.6 Nagasawa's Mind-Body in an Infinitely Decomposable Universe
10.7 Musser's "Is It Really So Hard?"
10.8 Davies's Consciousness in the Cosmos

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Fig. 2. (*continued*).

exemplified by neurobiological mechanisms.

In addition, the ideas of epiphenomenalism, functionalism and emergence, and the mechanisms of prediction and language models, while themselves not specific explanations of consciousness, represent core concepts in philosophy of mind that can affect some explanations and influence some implications.

Some would impose an "entrance requirement" on the Landscape, such that theories admitted need be "scientific" in the sense that the scientific method should be applicable, whether in a formal Popperian falsification sense or with a weaker verification methodology. I do not subscribe to this limitation, although we must always distinguish between science and philosophy, along with other potential forms of knowledge. (My quasi-"Overton Window" of consciousness—the range of explanatory theories I feel comfortable presenting, if not propounding—may be wider than those of others, whether physicalists or nonphysicalists[13] [Birth, 2023]. One reason for my wider window is the unsolicited theories of consciousness I receive on *Closer To Truth*, some of which I find intriguing if not convincing.)

[13] "In politics, the 'Overton window' is the range of positions that politicians can safely raise in public discourse. Propose something outside the window and you can expect resistance—not just to the proposal itself, but to the idea that, after saying what you just said, you even merit a place in the debate. Science too has Overton windows. Sometimes positions can be so far outside the mainstream that they invite the charge that *we should not even be discussing this*" (Birth, 2023).

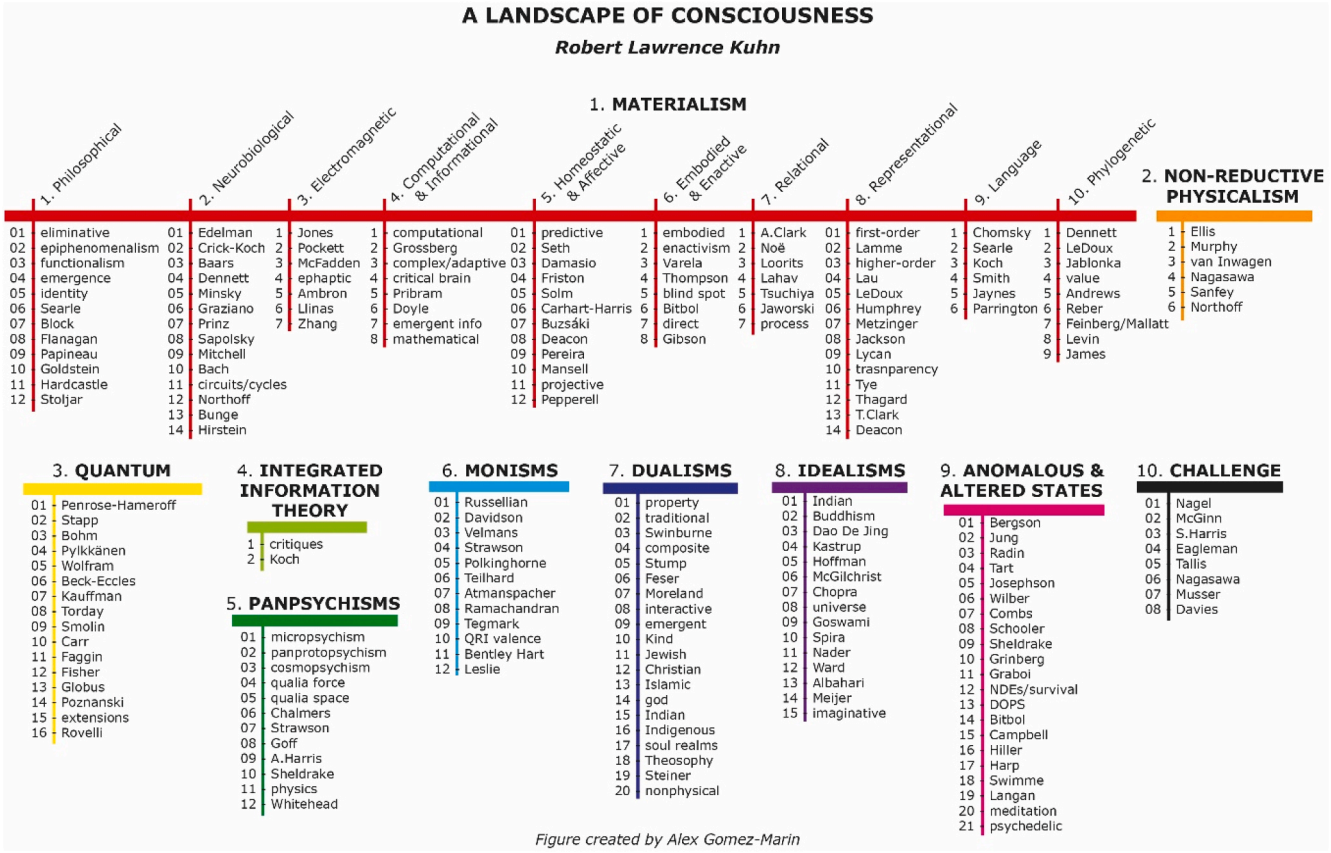

Fig. 3. A landscape of consciousness.

The Landscape itself, as a one-dimensional typology, is limited and imperfect decisions must be made: which theories to include and which not; where to classify; what is the optimal order; whether to append a possessive name to the theory's title; and the like. I've tried to include all the well-known theories and an idiosyncratic selection of lesser-known theories that have some aspects of originality, rationality, coherence, and, well, charm. In addition, a few theories reflect the beliefs of common people, or the interests of *Closer To Truth* viewers, though largely dismissed by the scientific and philosophical communities. Some theories some think bizarre, "fabulous" in the original meaning of the word: "mythical, celebrated in fable." All reflect the imaginations of the human mind driven by a quest to know reality. Please do not take the unavoidable appearance of visual equality among theories as indicating their truth-value equivalence (or, for that matter, my personal opinion of them).

Neuroscientist Joseph LeDoux (9.8.5; 9.10.2), noting "the broad nature" of the Landscape (on reviewing an early draft), suggests that "The Sniff Test" might be relevant. (He uses The Sniff Test to assess the strong AI view substituting "consciousness" for "intelligence" [LeDoux, 2023a, p. 301.]) I'm all for imposing an olfactory hurdle for theories of consciousness (recognizing that olfactory bulbs do differ).

Readers may well have corrections and additions, which I welcome. The Landscape is a work-in-process and I look forward to feedback so it can be extended and improved.

Once again, the rough flow of the theories arraying the Landscape of Consciousness—as per my idiosyncratic approach—is on a rough, arbitrarily linear, physicalism-nonphysicalism spectrum from, to begin with, most physical, and to end with, most nonphysical (or least physical) (Figs. 1–3).

9. Materialism theories

Materialism is the claim that consciousness is entirely physical, solely the product of biological brains, and all mental states can be fully "reduced" to, or wholly explained by, physical states—which, at their deepest levels, are the fields and particles of fundamental physics. In short, materialism, in its many forms and flavors, gives a completely physicalist account of phenomenal consciousness.

Overwhelmingly for scientists, materialism is the prevailing theory of consciousness. To them, the utter physicality of consciousness is an assumed premise, supported strongly by incontrovertible empirical evidence from neuroscience (e.g., brain impairment, brain stimulation). This is "Biological Naturalism," as exemplified by philosopher John Searle (Searle, 2007a, 2007b). It is a view, to a first approximation, that promises, if not yet offers, a complete solution to Chalmers's hard problem.[14]

To neuroscientist Susan Greenfield, the nonmaterialist view that consciousness might be irreducible is "'a get-out-of-jail-for-free card', that is to say, whatever I did, whatever I showed you, whatever experiments I did, whatever theories I had in brain terms, you could always say 'consciousness has the extra thing,' and this extra thing is the thing that really counts and is something that we brain scientists can't touch." She adds, "If reduction is a 'dirty word,' we can say explicable,

[14] In producing and hosting *Closer To Truth* over the years, I have interviewed David Chalmers and John Searle multiple times. One of my favorite *Closer To Truth* TV episodes is a retrospective of three interviews I did with Dave and John over a period of 15 years: 1999, when Dave and John were together on the same panel during the first season of Closer To Truth (roundtable format); 2007 (some months apart); and 2014, both at the 20th anniversary of the "Toward a Science of Consciousness" Conference in Tucson, Arizona (Chalmers and Searle, 2014).

interpretable, or understandable," but explaining consciousness must be always and solely in brain and body terms (Greenfield, 2012).

Compared to some of the consciousness-as-primary theories that follow, Materialism Theories can be counted as deflationary (which doesn't make them wrong, of course, or even unexciting). To physicist Sean Carroll, consciousness is "a way of talking about the physical world, just like many other ways of talking. It's one of these emergent phenomena that we find is a useful way of packaging reality, so we say that someone is conscious of something that corresponds to certain physical actions in the real world." Carroll is unambiguous: "I don't think that there is anything special about mental properties. I don't think there's any special mental realm of existence. I think it's all the physical world and all the manifold ways we have of describing it" (Carroll, 2016).

Nobel laureate biologist Gerald Edelman agrees. He does not consider the real existence of qualia to be an insurmountable impediment to a thoroughly materialistic theory of consciousness. "To expect that a theoretical explanation of consciousness can itself provide an observer with the experience of 'the redness of red' is to ignore just those phenotypic properties and life history that enable an individual animal to know what it is like to be such an animal. A scientific theory cannot presume to replicate the experience that it describes or explains; a theory to account for a hurricane is not a hurricane. A third-person description by a theorist of the qualia associated with wine tasting can, for example, take detailed account of the reported personal experiences of that theorist and his human subjects. It cannot, however, directly convey or induce qualia by description; to experience the discriminations of an individual, it is necessary to be that individual" (Edelman, 2003). While Edelman's honest assessment may give Materialism Theories their best shot, many remain unpersuaded. After all, still, we wonder: what are qualia? Literally, what are they!

Even among philosophers, a majority are physicalists (but just barely). In their 2020 survey of professional philosophers, Bourget and Chalmers report 51.9% support Physicalism; 32.1%, Non-physicalism; and 15.9%, Other (Bourget and Chalmers, 2023; Bourget and Chalmers, 2014).

Chalmers provides "roughly three ways that a materialist might resist the epistemic arguments" by mitigating the *epistemic gap* between the physical and phenomenal domains, where "each denies a certain sort of close epistemic relation between the domains: a relation involving what we can know, or conceive, or explain." According to Chalmers, "A type-A materialist denies that there is the relevant sort of epistemic gap. A type-B materialist accepts that there is an unclosable epistemic gap, but denies that there is an ontological gap. And a type-C materialist accepts that there is a deep epistemic gap, but holds that it will eventually be closed" (Chalmers, 2003).

A subtle way to think about Materialism Theories recruits the concept of "supervenience" in that "the mental supervenes on the physical" such that there cannot be a change in the mental without there being a change in the physical. One such subtlety is the modal force of the connection or dependency, parsing among logical necessity, metaphysical necessity, factual or empirical necessity, as well as among explanation, entailment, grounding, reduction, emergence, ontological dependence, and the like. For this Landscape of explanations of consciousness, we leave "supervenience" to others (McLaughlin and Bennett, 2021).

Similarly, the relationship between introspection and consciousness is an intimate one, linking the epistemology of self-knowledge with the metaphysics of mind. For several theories of consciousness, introspection is essential (e.g., neurophenomenology, 9.6.4 and 9.6.5), though for most, it is a non-issue (Smithies and Stoljar, 2012).

Two major theories of consciousness are Integrated Information Theory and Global Workspace Theory. Both are important, of course, and perhaps by situating them on the Landscape, they can be evaluated from different perspectives. In what may reflect my personal bias, I situate Global Workspace Theory under Materialism's Neurobiological Theories, while giving Integrated Information Theory its own first-order category. (This reflects my sense of the nature of their mechanisms, not my opinion of the truth of their claims.)

I group Materialism Theories into ten subcategories: Philosophical Theories, Neurobiological Theories, Electromagnetic Field Theories, Computational and Informational Theories, Homeostatic and Affective Theories, Embodied and Enactive Theories, Relational Theories, Representational Theories, Language Relationships, and Phylogenetic Evolution.

While many of the following theories under Materialism Theories proffer to explain what happens in consciousness, or what causes consciousness, in that they describe alternative critical processes in generating consciousness, the question always remains, are they even acknowledging, much less addressing, the question of what consciousness actually *is*?

In picking out multiple materialist theories and principles, many overlap or nest, obviously, but by presenting them separately, I try to tease out emphasis and nuance. The list cannot be exhaustive.

9.1. *Philosophical Theories*

Philosophical theories combine relevant fundamental principles for theories of consciousness with framing of the mind-body problem and philosophical defenses of Materialism.

9.1.1. *Eliminative materialism/illusionism*

Eliminative Materialism is the maximalist physicalist position that our common-sense view of the mind is misleading and that consciousness is in a kind of illusion generated by the brain—a contingent, evolutionary, inner adaptation that enhanced fitness and reproductive success. This deflationary view of consciousness is associated with philosophers Patricia Churchland (1986), Paul Churchland (1981), Daniel Dennett (1992), Keith Frankish (2022), and others, though their views are often distorted and caricatured.

Paul Churchland defines "eliminative materialism" forcefully as "the thesis that our common-sense conception of psychological phenomena constitutes a radically false theory, a theory so fundamentally defective that both the principles and the ontology of that theory will eventually be displaced, rather than smoothly reduced, by completed neuroscience." Our third-person understanding and even our first-person introspection, Churchland says, "may then be reconstituted within the conceptual framework of completed neuroscience, a theory we may expect to be more powerful by far than the common-sense psychology it displaces" He applauds "the principled displacement of folk psychology … [as] one of the most intriguing theoretical displacements we can currently imagine" (Churchland, 1981).

Patricia Churchland's path-setting 1986 book, *Neurophilosophy*, places the mind-body problem within the wider context of the philosophy of science and argues for a complete reductionist account of consciousness founded on neurobiology (Churchland, 1986). Indeed, "neurophilosophy" is the proffered name of a new discipline that is to be guided by Churchland's "unified theory of the mind-brain," for which her "guiding aim" is to develop "a very general framework" (Stent, 1987). She founds her approach on two principles: the progress of neuroscience in addressing mental states, and the recognition by many philosophers that philosophy is no longer "an a priori discipline in which philosophers can discover the a priori principles that neuroscientific theories had better honor on peril of being found wrong."

That there remain philosophers who persist in arguing that the mind goes beyond the brain—they reject reductionism "as unlikely—and not merely unlikely, but as flatly preposterous"—Churchland attributes to persistent traditions of folk myths. To discover our true nature, she implores, "we must see ourselves as organisms in Nature, to be understood by scientific methods and means" (Churchland, 1986). She rejects the anti-reductionist weapon of "emergence" as being "of little explanatory value" (Stent, 1987).

Dennett argues that qualia—the qualitive features of phenomenal consciousness—which he notes (with a smile) compel philosophers to develop outlandish theories, are illusory and incoherent (9.4). To neuroscientist Michael Graziano, it's not that consciousness doesn't exist or that we are fooled into thinking we have it when we don't. Instead, eliminative materialism likens consciousness to the illusion created for the user of a human-computer interface such that the metaphysical properties we attribute to ourselves are wrong[15] (Graziano, 2014, 2019a, 2019c).

In spite of the word "illusion" (see below). its proponents do not actually deny the reality of the things that compose what Wilfrid Sellars famously called "the manifest image"—thoughts, intentions, appearances, experiences—which he distinguished from "the scientific image" (Sellars, 1962). The things we see and hear and interact with are, according to Dennett, "not *mere* fictions but different versions of what actually exists: real patterns" (Dennett, 2017). The underlying reality, however—what exists in itself and not just apparently for us or for other creatures—is truly represented only by the scientific image, which must be expressed ultimately in the language of physics, chemistry, molecular biology, and neurophysiology.

Picking up on analogies in Dennett's work, as he puts it, Keith Frankish proposed the term "illusionism," which has been adopted for the view that consciousness does not involve awareness of special "phenomenal" properties and that belief in such properties is due to an introspective illusion. Frankish concludes: "Considered as a set of functional processes—a hugely complex informational and reactive engagement with the world—it is perfectly real. Considered as an internal realm of phenomenal properties or what-it-is-likenesses, it is illusory" (Frankish, 2022).

Although what we see and hear, for all the world, seems precisely what really exists, ringing in our ears and stars in our eyes undermine our realist folk psychology. (Personally, I have my own unambiguous proof. With my normal left eye, I see a light bulb as a single point of light; with my right eye, afflicted with advanced keratoconus, I see about 100 points of skewed, smeared light.)

Another approach claiming that there is no phenomenal consciousness draws on arguments from Buddhist philosophy of mind to show that the sense that there is this kind of consciousness is an instance of cognitive illusion. As articulated by Jay Garfield, "there is nothing 'that it is like' to be me. To believe in phenomenal consciousness or 'what-it's-like-ness' or 'for-me-ness' is to succumb to a pernicious form of the Myth of the Given." He argues that "there are no good arguments for the existence of such a kind of consciousness" (Garfield, 2016).

The fact that some deny the existence of experience, says philosopher Galen Strawson, should make us "feel very sober, and a little afraid, at the power of human credulity." This particular denial, he says with flourish, "is the strangest thing that has ever happened in the whole history of human thought, not just the whole history of philosophy" (Strawson, 2009).

While dismissing eliminative materialism and illusionism might at first seem obviously right, a prima facie case, I'd not so quickly jump to that conclusion: it could self-limit the awareness of subtleties and the nature of boundaries in the hunt for consciousness.

9.1.2. Epiphenomenalism

In epiphenomenalism, consciousness is entirely physical, solely the product of biological brains, but mental states cannot be entirely reduced to physical states (brains or otherwise), and mental states have no causal powers. Constrained by the "causal closure of the physical," the mind, whatever else it might be, is entirely inert: our awareness of consciousness is real, but our sense of mental causation is not. Consciousness is still a kind of illusion or trick in that there is no "top-down causation"; our sense that our thoughts can cause things is mistaken. In this manner, epiphenomenalism is a weaker form of non-reductive physicalism (10). All conscious mental events, including conscious perceptions, involve unconscious processing. The classic analogy for consciousness as an epiphenomenon is "foam on an ocean wave:" always there, apparently active, but never really doing anything.

More formally, epiphenomenalism holds that phenomenal properties are ontologically distinct from physical properties, and that the phenomenal has no effect on the physical. Physical states cause phenomenal states, but not vice versa. The arrow of psychophysical causation points in only one direction, from physical to phenomenal (Chalmers, 2003). This makes epiphenomenalism a weak form of Dualism (15), but by affirming the complete causal closure of the physical, it well deserves its spot in Materialism Theories.

Apparent support for consciousness epiphenomenalism comes from the famous Libet experiment, which demonstrated that brain activity associated with a voluntary movement ("readiness potential") precedes conscious experience of the intention to make that movement by several hundred milliseconds (Frith and Haggard, 2018). The implication is that the brain, rather than conscious "free will", initiates voluntary acts. Studied extensively, the Libet readiness potential data are reproducible and robust under diverse experiment designs. However, its theoretical and methodological foundations have been challenged (Gholipour, 2019), particularly with respect to stochastic noise in brain, the spontaneous fluctuations in neuronal activity (Schurger et al., 2012).

Epiphenomenalism highlights the need to recognize that the search for a metaphysical theory of consciousness must integrate a theory of mental causation, which in turn must deal with the epistemic problem of self-knowledge. In epiphenomenalism, the integration is obvious because the lack of mental causation is its primary feature. In other theories of consciousness, mental causation will be less obvious but perhaps no less important.

Daniel Stoljar notes that if phenomenal consciousness would be "merely an epiphenomenon with no causal force," perhaps "this will end up being the best option for dualism 2.0 (15.10), despite its being counterintuitive—after all, it certainly seems to us that our phenomenally conscious states causally matter. But any view on the problem of consciousness is likely going to have to embrace some counterintuitive result at some point" (Kind and Stoljar, 2023, p. 55).

Parallelism, a similar but less popular theory than epiphenomenalism, holds that physical events entirely cause physical events and mental events entirely cause mental events, but there is no causal connection between physical and mental worlds in either direction. But if no connection, what would maintain such perfect correspondences? It is no challenge to discern why parallelism is less popular.

9.1.3. Functionalism

Functionalism in philosophy of mind is the theory that functions are dispositive—activities, roles, results, outputs—mediums are not. What's critical is how mental states work, not in what substrates mental states are found (Levin, 2023). Mental states are not dependent on their internal constitutions, what they are, but rather only on their outputs or roles, what they do. As long as the functions (activities) are conducive to creating consciousness, it does not matter whether the substrates are neural tissue or computer chips or any form of matter that can instantiate information.

Ned Block defines functionalism as the theory that "mental states are constituted by their causal relations to one another and to sensory inputs and behavioral outputs." Functionalism can be appreciated, he says, by attending to "artifact concepts like carburetor and biological concepts like kidney. What it is for something to be a *carburetor* is for it to mix fuel and air in an internal combustion engine—carburetor is a functional concept. In the case of the kidney, the *scientific* concept is

[15] Ironically, Donald Hoffman appeals to the same analogy of a human-computer user interface to argue for the view diametrically opposite to that of Dennett and Graziano. Hoffman argues for Idealism, that not only is consciousness real, it is the only thing that is real fundamentally (Idealism, 16; Hoffman, 16.5).

functional—defined in terms of a role in filtering the blood and maintaining certain chemical balances" (Block, 1980; Block, 2007b).

Block gives the functionalist answer to the perennial question, "What are mental states?", stating simply that "mental states are functional states." The significance of this simple identity is precisely this simple identity. Thus, he says, "theses of metaphysical functionalism are sometimes described as functional state identity theses" (Block, 1980; Block, 2007b).

Block explores the relationship between functionalism and reductive physicalism. "The first step in a reductive physicalist enterprise," he says, "is to functionally characterize the property to be reduced and the second step is to find the physical property that fills the functional role. Reductive physicalism is true for the mind if both steps can always be carried out." Block makes the at-first counterintuitive claim that reductive physicalism and functionalism are "incompatible rivals," explaining that when understood as metaphysical theses, "appearances to the contrary stem from failure to sufficiently appreciate the upshot of the difference between metaphysics and ontology"—in that functionalism is agnostic on the existence of nonphysical substances (Block, 2008).

David Chalmers uses a silicon-chip-replacement thought experiment to support a functional approach to consciousness.[16] "When experience arises from a physical system," he says, "it does so in virtue of the system's *functional organization*." The thought experiment replaces brain neurons with microchips that can duplicate 100% of the neuron's functions, and to do so slowly, even one by one. (That such technology is fiendishly complex is irrelevant.) The question is, what happens to one's conscious experience, one's qualia? Would it gradually wink or fade out? Chalmers says no: the conscious experience, the qualia, would not change—there would be no difference at all. This result would support Chalmers's "principle of organ*izational invariance,* holding that experience is invariant across systems with the same fine-grained functional organization" (Chalmers, 1995a). Not everyone agrees, of course (Block, 2023; Van Heuveln et al., 1998).

Computational functionalism goes further and commits to the thesis that performing computations of a particular, natural and likely discoverable kind is both necessary and sufficient for consciousness in general and ultimately for human-level consciousness (and perhaps for speculative higher forms of consciousness). Whether consciousness is indeed computational elicits probative and profound debate (e.g., Penrose, 1999; 1996).

Functionalism with respect to consciousness is more an overarching principle, a way of thinking, than a proffered model, a claimed explanation on its own. Functionalism can apply in many Materialist Theories and it is often assumed as an a priori premise. Functionalism is the theoretical foundation of "virtual immortality," the theory that the fullness of our mental selves can be uploaded with first-person perfection to non-biological media, so that when our mortal bodies die our mental selves will live on (Kuhn, 2016a). (See Virtual Immortality.)

9.1.4. Emergence

Emergence is the claim that qualitatively new, even radically novel properties in biological systems and psychological states arise from physical properties governed entirely by the laws of physics. The re-emergence of emergence in the sciences, where whole entities are, or seem to be, more than the sum of all their parts, has been controversial, its assessment ranging from trivial and distracting to radical and revolutionary (Clayton and Davies, 2008). Emergence in the study of consciousness is especially foundational, more as a basic principle undergirding and enhancing various theories than as a specific theory in its own right.

Emergence, according to Paul Davies, means that "at each level of complexity, new and often surprising qualities emerge that cannot, at least in any straightforward manner, be attributed to known properties of the constituents. ln some cases, the emergent quality simply makes no sense when applied to the parts. Thus water may be described as wet, but it would be meaningless to ask whether a molecule of H^2O is wet" (Davies, 2008). Moreover, it could seem astonishing that the properties of two common gases, hydrogen and oxygen, can combine to form a liquid that is wet and a solid that expands when cooled. Yet, physics and physical chemistry can explain all of this, in terms of atomic structures and bonding angles.

Emergence can be appreciated in contrast with its mortal conceptual rival: reductionism. Reductionism is mainstream science, the bedrock assumption of the scientific method: All, in principle, can be explained by physics, even if all, in practice, cannot be.

Davies defines "ontological reductionism" as the state of affairs where all reality "is, in the final analysis, nothing but the sum of the parts, and that the formulation of concepts, theories, and experimental procedures in terms of higher-level concepts is merely a convenience." (He distinguishes "methodological reductionism," where reductionism is a "fruitful methodology," from "epistemological reductionism" where all we can know is that reductionism works by explaining one scientific level in terms of lower or more fundamental levels, without making any claim on ultimate reality.) (Davies, 2008).

But "for emergence to be accepted as more than a methodological convenience—that is, for emergence to make a difference in our understanding of how the world works," Davies argues that "something has to give within existing theory." Davies himself has been a leader in "a growing band of scientists who are pushing at the straitjacket of orthodox causation to 'make room' for strong emergence (see below), and although physics remains deeply reductionistic, there is a sense that the subject is poised for a dramatic paradigm shift in this regard" (Davies, 2008).

To make sense of emergence, we distinguish between its "weak" and "strong" forms. In its weak form, while it may not be apparent how the properties of one level can be entirely explained by the properties of a lower, more fundamental level, in principle, they can be explained, and ultimately, science will advance to explain them.

In its strong form, properties at one level can never be explained in terms of properties of lower levels, not even in principle, no matter how ultimate the science. As Davies explains, "Strong emergence is a far more contentious position, in which it is asserted that the micro-level principles are quite simply inadequate to account for the system's behaviour as a whole. Strong emergence cannot succeed in systems that are causally closed at the microscopic level, because there is no room for additional principles to operate that are not already implicit in the lower-level rules." He posits only three "loopholes": the universe is an open system, non-deterministic quantum mechanics, and computational imprecision at fundamental levels—all three have obvious problems, which is why they are "considered unorthodox departures from standard physical theory" (Davies, 2008).

David Chalmers says that "a high-level phenomenon is *strongly emergent* with respect to a low-level domain when the high-level phenomenon arises from the low-level domain, but truths concerning that phenomenon are not *deducible* even in principle from truths in the low-level domain." He distinguishes a high-level phenomenon that is "*weakly* emergent with respect to a low-level domain when the high-level phenomenon arises from the low-level domain, but truths concerning that phenomenon are unexpected given the principles governing the low-level domain" (Chalmers, 2008).

Strong emergence, Chalmers contends, has "radical consequences," such that "If there are phenomena that are strongly emergent with respect to the domain of physics, then our conception of nature needs to be expanded to accommodate them. That is, if there are phenomena whose existence is not deducible from the facts about the exact distribution of particles and fields throughout space and time (along with

[16] Ned Block says that the example used in the fading qualia argument may derive from John Haugeland (1980), but that "the best version is that of Chalmers (1995)" (Block, 2023, p. 451).

other laws of physics), then this suggests that new fundamental laws of nature are needed to explain these phenomena" (Chalmers, 2008).

By contrasting strong and weak emergence, Chalmers sets the stage to enact the grand epic of consciousness. "In a way, the philosophical morals of strong emergence and weak emergence are diametrically opposed. Strong emergence, if it exists, can be used to reject the physicalist picture of the world as fundamentally incomplete. By contrast, weak emergence can be used to support the physicalist picture of the world, by showing how all sorts of phenomena that might seem novel and irreducible at first sight can nevertheless be grounded in underlying simple laws" (Chalmers, 2008).

Chalmers is not shy: "I think there is exactly one clear case of a strongly emergent phenomenon, and that is the phenomenon of consciousness." He suggests that "the lawful connection between physical processes and consciousness is not itself derivable from the laws of physics but is instead a further basic law or laws of its own. The laws that express the connection between physical processes and consciousness are what we might call fundamental psychophysical laws" (Chalmers, 2008).

The challenge of strong emergence, especially in consciousness, is a deep probe of not only how the mind works but also how the world works. Its influence is felt all along the Landscape of Consciousness.

9.1.5. *Mind-brain identity theory*

As noted, mind-brain identity theory holds that states and processes of the mind are identical to states and processes of the brain (Smart, 2007) and as such can be considered the exemplar of materialism. Early on, in the mid-20th century, mind-brain identity theory had been a leader as an explanation of consciousness, but today, in its original form, it is no longer a major contender. Though the original identity theory has evolved in a kind of arms race with critics, it is generally considered undermined by various objections, the most common being multiple realizability (Aranyosi, *PhilPapers*).

9.1.6. *Searle's biological naturalism*

"Biological Naturalism" is the name philosopher John Searle gave to a neurobiological solution to the mind-body problem. His approach is to ignore the mind-body problem's philosophical history and focus on "what you know for a fact." He starts with a mundane, working definition of consciousness: "Conscious states are those states of awareness, sentience or feeling that begin in the morning when we wake from a dreamless sleep and continue throughout the day until we fall asleep or otherwise become 'unconscious'" (Searle, 2007b; Searle, 2014a).

Searle identifies four essential features of consciousness: "1. Conscious states, so defined, are qualitative, in the sense that there is a qualitative feel to being in any particular conscious state …. 2. Such conscious states are also ontologically subjective in the sense that they only exist as experienced by a human or animal subject …. 3. Furthermore, a striking fact, at any moment in your conscious life, all of your conscious states are experienced by you as part of a single unified conscious field …. 4. Most, but not all, conscious states are intentional, in the philosopher's sense that they are about, or refer to, objects and states of affairs."[17]

Next is crucial: "The reality and irreducibility of consciousness: Conscious states, so defined, are real parts of the real world and cannot be eliminated or reduced to something else." This means that one cannot do an ontological reduction of consciousness to more fundamental neurobiological processes, because, as stated, consciousness has a subjective or a first-person ontology, while the neurobiological causal basis of consciousness has an objective or third person ontology (Searle, 2007b).

[17] Searle refines his definition: "Consciousness so defined does not imply self-consciousness …. you do not need a general second-order consciousness to have a first-order consciousness." (Searle, 2007b).

The causal reducibility of consciousness leads to Searle's major move: "The neuronal basis of consciousness: All conscious states are caused by lower-level brain processes." Not knowing all the details of exactly how consciousness is caused by brain processes casts "no doubt that it is in fact." Searle asserts with confidence, "The thesis that all of our conscious states, from feeling thirsty to experiencing mystical ecstasies, are caused by brain processes is now established by an overwhelming amount of evidence (Searle, 2007b). (Others, of course, disagree.)

Finally, Searle's two-point conclusion: (i) The neuronal realization of consciousness: All conscious states are realized in the brain as higher level or system features, and (ii) The causal efficacy of consciousness: Conscious states, as real parts of the real world, function causally (Searle, 2007b).

Searle celebrates the fact that his approach to consciousness does not mention any of the usual-suspect theories, such as dualism, materialism, epiphenomenalism, or any of the rest of them. He argues that "if you take seriously the so-called 'scientific worldview' and forget about the history of philosophy," the views he puts forth are "what you would come up with."

Searle explains the name with which he "baptized this view," Biological Naturalism. "'Biological' because it emphasizes that the right level to account for the very existence of consciousness is the biological level … [given] we know that the processes that produce it are neuronal processes in the brain. 'Naturalism' because consciousness is part of the natural world along with other biological phenomena such as photosynthesis, digestion or mitosis, and the explanatory apparatus we need to explain it we need anyway to explain other parts of nature."

Searle responds to critics of Biological Naturalism, striking at a key objection. "Sometimes philosophers talk about naturalizing consciousness and intentionality, but by 'naturalizing' they usually mean denying the first person or subjective *ontology* of consciousness. On my view, consciousness does not need naturalizing: It already is part of nature and it is part of nature as the subjective, qualitative biological part" (Searle, 2007a, 2007b).

9.1.7. *Block's biological reductionism*

Philosopher Ned Block represents a majority of philosophers (and a large majority of scientists) who hold that "phenomenal consciousness is reducible to its physical basis." (Block, 2023, p. 445; Block, 2007a). The best candidates for this reduction, he says, involve neurobiology. "For example, in the creatures that seem to have consciousness (e.g., primates, octopi), neurons operate via electrical signals triggering the release of neurotransmitters, and the neurotransmitters in turn engender further electrical signals. Neurons operate in a chemical soup, with direct effects from one neuron to another mediated by chemicals. The release of chemicals is not confined to the synapse but can also happen in dendrites" (Block, 2023, p. 446).

These propagating neurophysiological sparks and diffusing neurochemical transmitters compose a magnificently complex and integrated system that carries and conveys meaning. Block appeals to "this electrochemical nature of known cases of consciousness as an example of a candidate for neurobiological reduction of consciousness."

To Block, "the border between seeing and thinking" provides insight into consciousness and helps adjudicate best theories (Block, 2023). He highlights this "joint in nature" between perception and cognition and advocates its study for demystifying the mind. He argues against theories of consciousness that focus on prefrontal cortex, arguing that perceptual consciousness does not require cognitive processing.

9.1.8. *Flanagan's constructive naturalism*

To philosopher Owen Flanagan, "consciousness is neither miraculous nor terminally mysterious," and he argues that "it is possible to understand human consciousness in a way that gives its subjective, phenomenal aspects their full due, while at the same time taking into account the neural bases of subjectivity." The result, he says, "is a powerful synthetic

theory of consciousness, a 'constructive naturalism,' according to which subjective consciousness is real, plays an important causal role, and resides [without residue] in the brain" (Flanagan, 1993).

The "constructive naturalistic theory" that Flanagan sketches is "neurophilosophical" in that "it tries to mesh a naturalistic metaphysic of mind with our still sketchy but maturing understanding of how the brain works." It pictures consciousness "as a name for a heterogeneous set of events and processes that share the property of being experienced. Consciousness is taken to name a set of processes, not a thing or a mental faculty." The theory is neo-Darwinian, he says, "in that it is committed to the view that the capacity to experience things evolved via the processes responsible for the development of our nervous system." The theory, he stresses, "denies that consciousness is as consciousness seems at the surface." Rather, consciousness has a complex structure, and getting at it requires "coordination of phenomenological, psychological, and neural analyses" (Flanagan, 1993).

Flanagan explains that "there is no necessary connection between how things seem and how they are … [and] we are often mistaken in our self-reporting, including in our reporting about how things seem." This is why he cautions that phenomenology might do "more harm than good when it comes to developing a proper theory of consciousness, since it fosters certain illusions about the nature of consciousness" (Flanagan, 1993).

"The most plausible hypothesis," Flanagan states, "is that the mind is the brain, a Darwin machine that is a massively well-connected system of parallel processors interacting with each other from above and below, and every which way besides." It is no wonder, he says, that "meaning holism is true, that we somehow solve the frame problem, and that my belief that snow is white is realized quite possibly in a somewhat different way in my brain than the same belief is realized in yours."

Flanagan addresses "the gap between the first-person way in which conscious mental life reveals itself and the way it is, or can be described, from an objective point of view" by asserting bluntly, "mind and brain are one and the same thing seen from two different perspectives. The gap between the subjective and the objective is an epistemic gap, not an ontological gap." Indeed, he claims, "it is precisely the fact that individuals possess organismic integrity that explains why subjectivity accrues first-personally" (Flanagan, 1993).

As a physicalist, Flanagan recognizes the role of emergence, that "there are emergent natural properties that, despite being obedient to the laws of physics, are not reducible to physics" (Flanagan, 2003). He rejects epiphenomenalism, where "conscious thought plays no role in the execution of any act." The sense that we control our actions is real, not illusion, but the mechanism is all brain-bound; for example, an idea originating in the prefrontal cortex that calls up information or memories from parietal association cortex (Campbell, 2004).

To Flanagan, the "really hard problem" is finding "meaning in a material world" (Flanagan, 2007). To this end, he explores "neuro-existentialism," the condition "caused by the rise of the scientific authority of the human sciences and a resultant clash between the scientific and the humanistic image of persons" (Flanagan and Caruso, 2018).

9.1.9. *Papineau's mind-brain identity*

Philosopher David Papineau argues for neurobiological physicalism with his theory of unabashed, robust, fundamental mind-brain identity. It is an important argument, with implications for all materialist theories (Papineau, 2020b).

In constructing the argument, one of Papineau's intuitions is that "there seems no immediate reason why consciousness should be singled out as posing some special puzzle about its relation to the rest of reality"—given that "reality contains many different kind of things, biological, meteorological, chemical, electrical, and so on, all existing alongside each other, and all interacting causally in various ways" (Papineau, 2020b).

One Papineau premise is that while we feel "conscious mind influences non-conscious matter, by controlling bodily behaviour, and similarly that matter influences mind, giving rise to sensory experiences, pains and other conscious mental states," the "compelling argument … against this kind of interactionist stance … derives from the so-called 'causal closure of the physical' … the physical realm seems causally sufficient unto itself."

Papineau notes that we remain puzzled about why brain states give rise to mental states "in a way that we don't feel puzzled about why NaCl gives rise to salt, or electrical discharges to lightning." He attributes our puzzlement—the "explanatory gap" of consciousness—to the psychosocial fact that "we find it hard to escape the spontaneous dualist thought that the feeling and the physical state are not one thing, but two different states that somehow invariably accompany each other" (Papineau, 2020b).

Given this, Papineau says, "our knowledge of mind-brain identities can only be based on some kind of a posteriori abductive inference, rather than a principled a priori demonstration that a certain physical state fills some specified role. For example, we might observe that pains occur whenever prefrontal nociceptive-specific neurons fire, and vice versa; we might also note that, if pains were the firing of nociceptive-specific neurons, then this would account for a number of other observed facts about pain, such as that it can be caused by trapped nerves, and can be blocked by aspirin; and we might conclude on this basis that pains are indeed identical to the firing of nociceptive-specific neurons." Papineau singles out "the peculiarly direct nature of our concepts of conscious states" as what "stops us deriving mind-brain identities a priori from the physical facts."

In exploring the basis of identity claims, Papineau states "it can only be on the basis of an abductive inference from direct empirical evidence, such as that the two things in question are found in the same places and the same times, and are observed to bear the same relations to other things, not because we can deduce the identities a priori from the physical facts." His examples include "Cary Grant = Archie Leach", and "that dog = her pet." "Why shouldn't this same way of thinking be applied to consciousness, he asks?" (Papineau, 2020b).

Because, he answers, "even after we are given all the abductive evidence, we still find mind-brain identity claims almost impossible to believe. We cannot resist the dualist conviction that conscious feelings and the physical brain states are two different things." And this, in Papineau's view, "is the real reason why we feel a need for further explanation. We want to know why the neuronal activity is accompanied by *that* conscious feeling, rather than by some other, or by no feeling at all. Our dualist intuitions automatically generate a hankering for further explanation." Thus, Papineau concludes, "the demand for explanation arises, not because something is lacking in physicalism, but because something is lacking in us."

"If only we could fully embrace physicalism," Papineau suggests, "the feeling of an explanatory gap would disappear. If we could fully accept that pains are nociceptive-specific neuronal firing, then we would stop asking why 'they' go together—after all, nothing can possibly come apart from itself."

To Papineau, this kind of robust physicalism can dissolve "the problem of consciousness". The move is to "simply deny that any puzzle is raised by the fact that it feels painful to be a human with active nociceptive-neurons. Why shouldn't it feel like that? That's how it turns out. Why regard this as puzzling?" (Papineau, 2020a).

An insight is the connotation of verbs used to describe the relation between mind and brain. Brain processes are said to "generate", or "yield", or "cause", or "give rise to" conscious states. But this phraseology, Papineau says, undermines physicalism from the start—even when used by physicalists. As he puts it, "Fire 'generates', 'causes', 'yields' or 'gives rise to' smoke. But NaCl doesn't 'generate', 'cause', 'yield' or 'give rise to' salt. It *is* salt. The point is clear. To speak of brain processes as 'generating' conscious states, and so on, only makes sense if you are implicitly thinking of the conscious states as separate from the brain states" (Papineau, 2020b). (But even if consciousness as an

"output" or "effect" of the brain were wrongheaded, why are only *certain sorts* of neural activity identical with consciousness while others are not?)

To sustain his argument, Papineau must deal with zombies. Are zombies possible? "Could a being share all your physical properties but have no conscious life?" Everybody's first thought is, he says, "Sure. Just duplicate the physical stuff and leave out the feelings."

That's the anti-physicalist "trap": the physicalist has already lost. Papineau rightly states that physicalists must deny that zombies are possible, "given that the mind is ontologically inseparable from the brain." If conscious states *are* physical states—radically identical—then, he says, "the 'two' cannot come apart," much like Marilyn Monroe cannot exist without Norma Jean Baker. How could she exist without herself? That makes no sense, he says.[18]

Papineau rejects the anti-physicalist argument that phenomenal concepts are revelatory, in that they reveal conscious states not to be physical. "Physicalists respond that there is no reason to suppose that phenomenal concepts have the power to reveal such things … that experiences are non-physical." Why should introspection, he asks rhetorically, "be guaranteed to tell us about *all* their necessary properties [of experience]?" (Papineau, 2020b).

Papineau is blunt: "I never viewed the so-called 'hard problem' as any problem at all." The obvious answer, he says, is that brain processes feel like something for the subjects that have them. "What's so hard about that?.. How would you expect them to feel? Like nothing? Why? That's how they feel when you have them." The only reason that many people believe there is a problem, Papineau stresses, is that "they can't stop thinking in dualist terms" (Papineau, 2020b).

As for the conventional materialist claim that ultimately neuroscience will uncover the complete neurobiological basis of consciousness, Papineau is skeptical. He does not expect that "there are definite facts about consciousness to which we lack epistemological access—that there is some material property that really constitutes being in pain, say, but which we can't find out about." Rather, he argues, "our phenomenal concepts of conscious states are vague—nothing in the semantic constitution of phenomenal concepts determines precisely which of the candidate material properties they refer to" (Papineau, 2003).

Scientific research, he says, will identify "a range of material properties that correlate in human beings with pain, say, or colors, or indeed being conscious at all. However, this won't pinpoint the material essence of any such conscious state, for there will always be a plurality of such human material correlates for any conscious property … It is not as if conscious properties have true material essences, yet science is unable to discover them. Rather the whole idea of identifying such essences is a chimera, fostered by the impression that our phenomenal concepts of conscious states are more precise than they are" (Papineau, 2003).

9.1.10. Goldstein's mind-body problem

Philosopher-novelist Rebecca Newberger Goldstein centers the mind-body problem around the nature of the person, with two distinct kinds of descriptions: our physical bodies and brains, which science can, in principle, analyze completely; and our inner thoughts, perceptions, emotions, dreams, which science can never access completely (Goldstein, 2011a, 2011b).

Goldstein thinks that the internal description of what it's like to be a person—"what I try to do in creating a character in a novel"—is "really about the body because ultimately there are no nonmaterial states."

Goldstein states that the kind of stuff underlining these intentional states or states of feeling that we describe in terms of consciousness is entirely brain stuff. "Could we ever derive the one description from the other? Could we ever know enough about the brain stuff so that we could actually know everything there is to be a person, just by the description of the brain stuff? I don't think so" Goldstein (2011a), 2011b).

Goldstein says that panpsychism (13) seems plausible and she understands why some are dualists, where that internal point of view is something that is not the body, and could, in principle, exist separate from the body. She appreciates why some people who hope for immortality hope dualism is true. (She herself rejects dualism.)

9.1.11. Hardcastle's argument against materialism skeptics

Philosopher Valerie Gray Hardcastle argues that the points of division between materialists and materialism-skeptics "are quite deep and turn on basic differences in understanding the scientific enterprise." This disagreement, "the rifts," which she frames, in part, between David Chalmers and herself, concerns whether consciousness is a brute fact about the world, which materialists deny and its skeptics affirm. Rather, materialists believe that consciousness is part of the physical world, just like everything else. "It is completely nonmysterious (though it is poorly understood) [and materialists] have total and absolute faith that science as it is construed today will someday explain this as it has explained the other so-called mysteries of our age" (Section: Hardcastle, 1996).

Hardcastle gives her clear-eyed assessment: "I am a committed materialist and believe absolutely and certainly that empirical investigation is the proper approach in explaining consciousness. I also recognize that I have little convincing to say to those opposed to me. There are few useful conversations; there are even fewer converts." She epitomizes the skeptics' position: "Isolating the causal relations associated with conscious phenomena would simply miss the boat, for there is no way that doing that ever captures the qualitative aspects of awareness. What the naturalists might do is illustrate *when* we are conscious, but that won't explain the *why* of consciousness." Thus, she continues, whatever the neural correlate(s) of consciousness may be, the naturalists would not have explained why it is *that* (or *those*). Part of a good explanation, skeptics maintain, "is making the identity statement (or whatever) intelligible, plausible, reasonable" and this is what materialists have not done and thus have not closed the explanatory gap.

In response, Hardcastle is frank: "To them, I have little to say in defence of naturalism, for I think nothing that I as an already committed naturalist could say would suffice, for we don't agree on the terms of the argument in the first place." The consciousness identity, whatever it turns out to be, could be a brute fact about the world, just like the laws of physics. At some point, in all theories, explanations must end. Hardcastle asks, "How do I make my identification of consciousness with some neural activity intelligible to those who find it mysterious? My answer is that I don't. The solution to this vexing difficulty, such as it is, is all a matter of attitude. That is, the problem itself depends on the spirit in which we approach an examination of consciousness." In characterizing "consciousness-mysterians," she states, "They are antecedently convinced of the mysteriousness of consciousness and no amount of scientific data is going to change that perspective. Either you already believe that science is going to give you a correct identity statement, or you don't and you think that there is always going to be something left over, the phenomenal aspects of conscious experience" (Hardcastle, 1996).

Hardcastle's advice to skeptics? "Consciousness-mysterians need to alter their concepts. To put it bluntly: their failure to appreciate the world as it really is cuts no ice with science. Their ideas are at fault, not the scientific method. Materialists presume that there is some sort of identity statement for consciousness. (Of course, we don't actually have one yet, but for those of us who are not consciousness-mysterians, we feel certain that one is in the offing.) Hence, the skeptics can't really imagine possible worlds in which consciousness is not whatever we ultimately discover it to be because they aren't imagining consciousness in those cases (or, they aren't imagining properly). But nevertheless, what can I say to those who insist that they can imagine consciousness as beyond science's current explanatory capacities? I think nothing …"

[18] Papineau distinguishes possibility from conceivability. "A posteriori physicalists have no choice but to allow that they [zombies] are at least *conceivable*," even if not possible (Papineau, 2020b).

The fundamental difference between materialists and their skeptics, according to Hardcastle, is that "Materialists are trying to explain to each other what consciousness is within current scientific frameworks … If you don't antecedently buy into this project …, then a naturalist's explanation probably won't satisfy you. It shouldn't. But that is not the fault of the explanation, nor is it the fault of the materialists. If you don't accept the rules, the game won't make any sense" (Hardcastle, 1996).

Hardcastle's own approach to consciousness includes: viewing it as a lower-level dynamical structure underpinning our information processing (Hardcastle, 1995); the relation between ontology and explanation providing a framework for referring to mental states as being the causally efficacious agents for some behavior (Hardcastle, 1998); a more nuanced approach to the neural correlates of consciousness (NCC) in that it "there might not be an NCC—even if we adopt a purely materialistic and reductionistic framework for explaining consciousness (for example, perhaps consciousness is located out in the world just as much as it is located inside the head) (Hardcastle, 2018; Hardcastle and Raja, 1998); and action selection and projection to help refine notions of consciousness from an embodied perspective (Hardcastle, 2020).

9.1.12. Stoljar's epistemic view and non-standard physicalism

Philosopher Daniel Stoljar has long focused on physicalism, its interpretation, truth and philosophical significance; his views are nuanced and largely deflationary (Stoljar, 2010). He defines physicalism as the thesis that "every instantiated property is either physical or is necessitated by some physical property," where physical property is described by "all and only the following elements: it is a) a distinctive property of intuitively physical objects, b) expressed by a predicate of physics, c) objective, d) knowable through scientific investigation, and e) not a distinctive property of souls, ectoplasm, etc." (Montero, 2012). According to Stoljar, "Physicalism has no formulations on which it is both true and deserving of the name"—but this "does not entail that philosophical problems stated in terms of it [physicalism] have no reasonable formulation" (Stoljar, 2010; Montero, 2012).

As everyone knows, the philosophical problem of phenomenal consciousness is the poster-child test case for physicalism, the standard physicalist framework being that "consciousness can be explained by contemporary physics, biology, neuroscience, and cognitive science" (Kind and Stoljar, 2023, p. i). To Stoljar, the problem (or problems) of consciousness is "whether two big ideas can both be true together. The first is the existence of consciousness. The second is a worldview (a picture of everything that exists) that many people think you must believe if you hold a vaguely scientific or rational approach to the world, namely, physicalism." Stoljar calls it the "compatibility problem"— "i.e., the problem of whether physicalism and claim that consciousness exists can both be correct"—and he says that the solution is "right under our nose." The solution to the compatibility problem, Stoljar tells us, "is that we are missing something"—and the depth and implications of this simple statement are surprisingly profound (Kind and Stoljar, 2023, pp. 64–65).

What we are missing, according to Stoljar, "is a type of physical fact or property relevant to consciousness. More than this, we are profoundly ignorant of the nature of the physical world, and ignoring this ignorance is what generates the problem." He calls "the idea that we are ignorant of a type of fact or property that is relevant to consciousness the *ignorance hypothesis*" and he calls "the idea that the ignorance hypothesis solves the compatibility problem the *epistemic view*." Stoljar contends that all arguments for the opposing view—i.e., that physicalism and consciousness are incompatible—"fail, and for a single reason." These arguments, he says, "all presuppose that we have complete knowledge of the physical facts relevant to consciousness. According to the epistemic view, that presupposition is false, so the arguments [against physicalism-consciousness compatibility] don't work." That physicalism cannot be shown affirmatively to be true does not bother Stoljar, because, he says, physicalism is an empirical truth, not an a priori argument. "What the epistemic view says is that … there is no persuasive 'here and now' argument for incompatibility." Thus, Stoljar argues, the epistemic view helps us think about the problems of consciousness in a clearer way, disentangling them from the compatibility problem (Kind and Stoljar, 2023, pp. 64–66).

Stoljar is no traditional physicalist. He critiques "standard physicalism," by which he means "versions of physicalism that make no theoretical use of the ignorance hypothesis." He conjectures that there are properties of the physical world that go beyond the capacity of the physical sciences to access and measure through its devices and instruments. Is this incapacity in practice, as per current science, or in principle, such that ultimate truth is forever out of reach? Who knows? Either way, he says, would support his ignorance hypothesis defense of physicalism (Kind and Stoljar, 2023, p. 67). More subtly, Stolar contends that the epistemic view *does* provide an "explanation of consciousness," at least in an abstract sense. "It tells us, for example, that conscious states are not fundamental and so depend on other things, even if it leaves open what exactly they depend on" (Kind and Stoljar, 2023, p. 112).

Yet Stoljar believes it is possible to construct "a science of consciousness"—to study "empirical laws between each conscious state and some physical system"— but he is skeptical of "the attempt to provide systematic knowledge of such laws" which he rejects as "implausible on its own terms." Preferring "to understand the science in a more modest way," Stoljar is ready to accept "that we do not and may never have a complete theory of the world" (Kind and Stoljar, 2023, pp. 67–68).

9.2. Neurobiological theories

Neurobiological theories are based primarily on known mechanisms of the brain, such as neuronal transmission, brain circuits and connectome pathways, electric fields, and, of course, neural correlates of consciousness.

9.2.1. Edelman's neural Darwinism and reentrant neural circuitry

Nobel laureate biologist Gerald Edelman presents a purely biological theory of consciousness, founded on Darwinian natural selection and complex brain morphology. His foundational commitment is that "the neural systems underlying consciousness arose to enable high-order discriminations in a multidimensional space of signals," that "qualia are those discriminations" and that "differences in qualia correlate with differences in the neural structure and dynamics that underlie them" (Edelman, 2000, 2003, 2024).

Rejecting theories that the brain is like a computer or instructional system, Edelman proposes that "the brain is a selectional system, one in which large numbers of variant circuits are generated epigenetically, following which particular variants are selected over others during experience. Such repertoires of variant circuits are degenerate, i.e., structurally different circuit variants within this selectional system can carry out the same function or produce the same output. Subsequent to their incorporation into anatomical repertoires during development, circuit variants that match novel signals are differentially selected through changes in synaptic efficacy. Differential amplification of selected synaptic populations in groups of neurons increases the likelihood that, in the future, adaptive responses of these groups will occur following exposure to similar signals" (Edelman, 2003).

Edelman's way of thinking is motivated by his work on the immune system (for which he was awarded the Nobel) and his theory is developed in two domains: Neural Darwinism (neural group selection) and Dynamic Core (reentrant neural circuitry).

Neural Darwinism is "the idea that higher brain functions are mediated by developmental and somatic selection upon anatomical and functional variance occurring in each individual animal" (Edelman, 1989). Neural Darwinism has two aspects: (i) development selection, which controls the gross anatomy and microstructure of the brain, allowing for great variability in the neural circuitry; and (ii) experiential selection, especially of the synaptic structure where functional plasticity is essential given the vast number of synapses (estimated at over 100

trillion, possibly 600 trillion or more). Edelman notes that a child's brain contains many more neural connections than will ultimately survive to maturity—estimates go as high as 1000 trillion—and he argues that this redundant capacity, this functional plasticity, is needed because "neurons are the only cells in the body that cannot be renewed and because only those networks best adapted to their ultimate purpose will be selected as they organize into neuronal groups" (Edelman, 2024). According to Edelman's theory of neuronal group selection (TNGS), "selectional events in the brain are necessarily constrained by the activity of diffuse ascending value systems. The activity of these systems affects the selectional process by modulating or altering synaptic thresholds" (Edelman, 2003).

Dynamic Core is Edelman's term encompassing reentrant neural circuitry, the ongoing process of recursive signaling among neuronal groups taking place across networks of massively parallel reciprocal fibers, especially in the connections between thalamus and cerebral cortex. This dynamic, relentless activity in thalamocortical circuits generates a continuing sequence of different metastable states that change over time, yet each of which has a unitary phenomenology at any given moment. Edelman asserts "there is no other object in the known universe so completely distinguished by reentrant circuitry as the human brain" (Edelman, 2003, 2024).

Edelman stresses that reentry is "a selectional process occurring in parallel" and that "it differs from feedback, which is instructional and involves an error function that is serially transmitted over a single pathway." As a result of the correlations that reentry imposes on diverse, interacting neuronal groups, "synchronously active circuits across widely distributed brain areas are selectively favored." This, Edelman suggests, "provides a solution to the so-called binding problem: how do functionally segregated areas of the brain correlate their activities in the absence of an executive program or superordinate map?" Binding of the outputs of every sensory modality, each generated by segregated cortical areas, is essential for our commonly perceived but underappreciated unity of consciousness (Edelman, 2003).

It is worth noting the close relationship between the Dynamic Core and Global Workspace (9.2.3) hypotheses, as jointly suggested by the authors of each, Edelman and Baars—each hypothesis having been put forward, independently, "to provide mechanistic and biologically plausible accounts of how brains generate conscious mental content." Whereas "the Dynamic Core proposes that reentrant neural activity in the thalamocortical system gives rise to conscious experience," the "Global Workspace reconciles the limited capacity of momentary conscious content with the vast repertoire of long-term memory." The close relationship between the two hypotheses is said to allow "for a strictly biological account of phenomenal experience and subjectivity that is consistent with mounting experimental evidence." The authors suggest that "there is now sufficient evidence to consider the design and construction of a conscious artifact" (Edelman et al., 2011).

The theory of neuronal group selection (TNGS), pioneered by Edelman (1987), has come to undergird a cluster of theories. As Anil Seth explains, "According to the TNGS, primary (sensory) consciousness arose in evolution when ongoing perceptual categorization was linked via reentry to a value-dependent memory creating the so-called 'remembered present' (Edelman 1989). Higher-order consciousness, distinguished in humans by an explicit sense of self and the ability to construct past and future scenes, arose at a later stage with reentrant pathways linking value-dependent categorization with linguistic performance and conceptual memory (Edelman 2003; Seth, 2007).

As Edelman's mechanism for consciousness is based on the TNGS, he first distinguishes primary from higher-order consciousness. "Animals with primary consciousness can integrate perceptual and motor events together with memory to construct a multimodal scene in the present"—what James called the "specious present" and which Edelman calls "the remembered present" (Edelman, 1989). Such an animal with primary consciousness, Edelman says, "has no explicit narrative capability (although it has long-term memory), and, at best, it can only plan to deal with the immediate scene in the remembered present" (Edelman, 2003).

As for higher-order consciousness, Edelman is mainstream: "It emerges later in evolution and is seen in animals with semantic capabilities such as chimpanzees. It is present in its richest form in the human species, which is unique in possessing true language made up of syntax and semantics. Higher-order consciousness allows its possessors to go beyond the limits of the remembered present of primary consciousness. An individual's past history, future plans, and consciousness of being conscious all become accessible" (Edelman, 2003).

How did the neural mechanisms underlying primary consciousness arise during evolution? Edelman's proposal is as follows. "At some time around the divergence of reptiles into mammals and then into birds, the embryological development of large numbers of new reciprocal connections allowed rich reentrant activity to take place between the more posterior brain systems carrying out perceptual categorization and the more frontally located systems responsible for value-category memory. This reentrant activity provided the neural basis for integration of a scene with all of its entailed qualia … [which] conferred an adaptive evolutionary advantage" (Edelman, 2003).

In summary, according to Edelman, "consciousness arises as a result of integration of many inputs by reentrant interactions in the dynamic core. This integration occurs in periods of <500 ms. Selection occurs among a set of circuits in the core repertoire; given their degeneracy, a number of different circuits can carry out similar functions. As a result of the continual interplay of signals from the environment, the body, and the brain itself, each integrated core state is succeeded by yet another and differentiated neural state in the core … The sequences and conjoined arrays of qualia entailed by this neural activity are the higher-order discriminations that such neural events make possible. Underlying each quale are distinct neuroanatomical structures and neural dynamics that together account for the specific and distinctive phenomenal property of that quale. Qualia thus reflect the causal sequences of the underlying metastable neural states of the complex dynamic core" (Edelman, 2003).

Finally, Edelman addresses the hard problem. "The fact that it is only by having a phenotype capable of giving rise to those qualia that their 'quality' can be experienced is not an embarrassment to a scientific theory of consciousness. Looked at in this way, the so-called hard problem is ill posed, for it seems to be framed in the expectation that, for an observer, a theoretical construct can lead by description to the experiencing of the phenomenal quality being described. If the phenomenal part of conscious experience that constitutes its entailed distinctions is irreducible, so is the fact that physics has not explained why there is something rather than nothing. Physics is not hindered by this ontological limit nor should the scientific understanding of consciousness be hindered by the privacy of phenomenal experience." Edelman is confident. "At the end of our studies, when we have grasped its mechanisms in greater detail, consciousness will lose its mystery and be generally accepted as part of the natural order" (Edelman, 2003).

Personally, I like analogizing the something/nothing ontological limit in physics to the phenomenal consciousness psychophysical privacy limit in neuroscience—the two ultimate questions of existence and sentience. But I hesitate to draw the analogy too tightly. Something/nothing is a kind of historical question of *what happened*, that is, explaining the hypothetical *process*. For example, it could be that nothing is in principle impossible. Phenomenal consciousness is a clearly contemporary question of *what is*, that is, explaining the actual *thing*. Moreover, I agree that even with its something/nothing ontological limit, physics can do its work, as with its phenomenal consciousness privacy limit, neuroscience can do its work. But that work, remember, constitutes the "easy problems."

9.2.2. *Crick and Koch's neural correlates of consciousness (NCC)*

The neural correlates of consciousness (NCC) is defined as the minimum activities in the brain jointly sufficient (and probably necessary)

for any one specific conscious perception, and, extended, for subjective experience in general, the inner awareness of qualia. Originally applied to sleep and wakefulness (i.e., the reticular activating system in the brain stem), the NCC were formally proposed by Francis Crick and Christof Koch as a scientific approach to what had been believed to be the vague, metaphysical and somewhat discredited idea of consciousness (Crick and Koch, 1990), a program then championed by Koch (Koch, 2004, *Closer To Truth*) and others (though Koch has become something of a "romantic reductionist" [Koch, 2012a]).

While there are complex methodological issues, NCC mechanisms include neuronal electrophysiological action potentials (spikes), their frequencies and sequences; neurochemical transmitter flows in the synapses between neurons; and recurrent brain circuits in specific brain areas. An example is clusters of neurons that underlie wakefulness in the brainstem connecting to clusters of neurons in the thalamus, hypothalamus, basal ganglia and cerebral cortex related to awareness/consciousness (Wong, 2023).

Similarly, a "default ascending arousal network" (dANN) has been proposed, with subcortical nodes in the brainstem, hypothalamus, thalamus, and basal forebrain (Edlow, 2024). While necessary for conscious arousal and wakefulness, the dANN is not sufficient for phenomenal conscioiusness and is not what this Landscape is about.

As an example of the NCC way of thinking, an early NCC candidate was the claustrum, which receives input from almost all regions of cortex and projects back to almost all regions of cortex, and which, Crick and Koch speculated, could give rise to "integrated conscious percepts." They used the analogy of the claustrum to a "conductor" and the cortex to an "orchestra," such that the claustrum as a conductor 'coordinates a group of players in the orchestra, the various cortical regions." Without the conductor, as they build the analogy, "players can still play but they fall increasingly out of synchrony with each other. The result is a cacophony of sounds." In the absence of the claustra in both cerebral hemispheres, attributes such as sensory modalities "may not be experienced in an integrated manner and the subject may fail to altogether perceive these objects or events or only be consciously aware of some isolated attribute." This would mean, they suggest, "that different attributes of objects … are rapidly combined and bound in the claustrum" (Crick and Koch, 2005).

A more recent candidate for full and content-specific NCC is located in the posterior cerebral cortex, in a temporo-parietal-occipital hot zone (Koch et al., 2016), though no one is yelling "Eureka" and the search continues. Even so, while everyone knows that even strong correlation is not causation, strong correlation is still something. NCCs can be considered macroscopic materialism.

It was in 1998 that Christof Koch made the now legendary 25-year bet with philosopher David Chalmers—they are long-time friends—that neuroscientists would discover a "clear" NCC by 2023. No surprise that the bet paid off in Chalmers' favor. (Koch presented Chalmers with a case of 1978 Madeira wine.) As Chalmers said, notwithstanding neuroscience's great progress, "It's clear that things are not clear," while Koch, feigning chagrin, agreed (Horgan, 2023).

Koch was down but not out: he may have lost this consciousness battle, but the consciousness war would still be waged. Koch offered to re-up: another bet, another 25 years to achieve that "clear" NCC, another case of wine. "I hope I lose," Chalmers said, smiling, taking the new bet, "but I suspect I'll win."

The smart money is again on Chalmers, although I have a different issue. What would a "clear" NCC mean? Suppose a specific group of neurons were proven to be both necessary and sufficient for a particular conscious experience, a direct correlation that no other group of neurons could claim? Koch would rightly win the bet, but would consciousness have been explained? Still, the perennial question: How can action potentials zipping along neurons and chemicals flowing between neurons literally *be* the phenomenal consciousness of inner experience? By what magic?

9.2.3. *Baars's and Dehaene's global workspace theory*

Proposed originally by Bernard Baars (Baars, 1988, 1997, 2002), extended with neuroimaging and computer modeling by Stanislas Dehaene (Dehaene and Naccache, 2000), the core claim of Global Workplace Theory (GWT) is brain-wide presence and broad accessibility of specific multi-sensory, multi-cognitive information, the total package being what constitutes conscious awareness. GWT is founded on the concept of an inner "theater of consciousness," where the mental spotlight of awareness shines on sequential sets of integrated perceptions that are dominant, at least momentarily. (The global workspace "Theater of Consciousness" is said not to contradict Dennett's rejected "Cartesian Theater," because the former is not dualistic and does not reside in only one location in the brain; rather, the Theater of Consciousness is passive not active and is spread across much of the brain.)

GWT holds that conscious mental states are those which are "globally available" to a wide range of brain processes including attention, perception, assessment, memory, verbal description, and motor response. Which sets of integrated perceptions become dominant, move to centerstage, and thus leap into conscious awareness? It's a competition. Diverse data flows originating both within the brain (e.g., memories) and from external stimuli (i.e., sensory information) are in constant competition, such that the "winner" is broadcast broadly (i.e., globally) in the brain and becomes accessible throughout the brain, which is how we become aware of it as the content of our consciousness.

This brain-wide focus on a particular phenomenological package integrates all the relevant sensory and cognitive streams by recruiting all the relevant brain areas into an organic whole—while inhibiting other, extraneous, conflicting data flows—such that what resides in the global workspace is perceived as consciousness "snapshots" in continuous, movie-like motion. This means that while our conscious awareness may seem unified and seamless, in fact it is neither.

Whereas GWT started in the 1980s as a purely psychological theory of conscious cognition, it has become a "family" of theories adapted to today's far more detailed understanding of the brain. The brain-based version of GWT is called Global Workspace Dynamics because the cortex is viewed as a "unified oscillatory machine". GWT, therefore, according to its advocates, joins other theories in taking consciousness as the product of highly integrated and widespread cortico-thalamic activity, including evidence that the prefrontal cortex participates in the visual conscious stream. Cortex is extraordinarily flexible in its dynamic recruitment of different regions for different tasks. Therefore, an arbitrary division between prefrontal and other neuronal regions is said to be misleading. Consciousness requires a much broader, more integrative view (Baars et al., 2021).

In a pioneering set of "adversarial collaboration" experiments to test hypotheses of consciousness by getting rival researchers to collaborate on the study design,[19] preliminary results did not perfectly match GWT's prediction that consciousness arises when information is broadcast to areas of the brain through an interconnected network. The transmission, according to GWT, happens at the beginning and end of an experience and involves the prefrontal cortex, at the front of the brain. But independent "theory-neutral" researchers found that only some aspects of consciousness, but not all of them, could be identified in the prefrontal cortex. Moreover, while they found evidence of brain broadcasting, the core of GWT, it was only at the beginning of an experience—not also at the end, as had been predicted. Further experiments are to come, but revisions to GWT are believed likely (Lenharo, 2023a,b, 2024).

9.2.4. *Dennett's multiple drafts model*

In his intellectual memoirs, *I've Been Thinking,* philosopher Daniel Dennett highlights two fundamental questions on which his career is founded—the two related philosophical problems he set himself to

[19] The adversarial experiments are envisioned and sponsored by the Templeton World Charity Foundation.

solve. "First, how can it be that some complicated clumps of molecules can be properly described as having states or events that are *about something*, that have meaning or content. And second, how can it be that at least some of these complicated clumps of molecules are conscious—that is, aware that they are gifted with states or events that are about something?" (Dennett, 2023a, 2023b).

In dealing with these questions, Dennett realized, way back in his PhD dissertation in 1965, that "the best—and only—way of making sense of the mind and consciousness is through evolution by natural selection on many levels." Dennett's core insight subsuming biological evolution in general and the development of mind in particular is concise: reasons without a reasoner, design without a designer, and competence without comprehension (Dennett, 2007).

Dennett's theory of consciousness is distinguished by four ideas: (i) there is no "Cartesian Theater," no inner witness viewing the consciousness show; (ii) different brain regions or modules develop different kinds of content, which Dennett calls "multiple drafts"; (iii) the multiple drafts compete with one another for attention, the winner of the winner-take-all competition occupying the entirety of the conscious moment, which Dennett calls "fame in the brain"; and (iv) the collection of all these conscious moments coalesces into a kind of life story, the emergence of a sense of "self," which Dennett describes as a "center of narrative gravity."

In *Consciousness Explained,* Dennett presents his multiple drafts model of consciousness (Dennett, 1992). He states that all varieties of perception, thought, or mental activity are processed in the brain via parallel, multitrack interpretations and elaborations, subject to continuous "editorial revision." These "yield, over the course of time, something *rather like* a narrative stream or sequence, the product of continual editing by many processes distributed around the brain." Dennett has the brain consisting of a "bundle of semi-independent agencies," and his metaphor "fame in the brain" tells us what it takes for competing ideas to determine the content of consciousness at any given moment.

In supporting his theory, Dennett needs to undermine what we take to be common sense. He challenges the verisimilitude of inner experience, which he calls more like theorizing than like describing. He rejects the notion of a single central location (his "Cartesian theater") where conscious experience can be "viewed." He dissolves the idea of the "self" as the central character of stories made up by content fixation and propagation in the brain. Moreover, he argues that the properties of qualia are incompatible and therefore incoherent, thus obviating the need to solve Chalmers's hard problem.[20] Dennett needs all four of these counterintuitive yet deeply probative assertions; the package is admirably coherent, but buying it is a tall order.

Of Dennett's four assertions, his desired demolition of qualia is perhaps his most critical move. Here is how he defends it. "Qualia are user-illusions*,* ways of being informed about things that matter to us in the world (our affordances) because of the way we and the environment we live in (microphysically) are. They are perfectly real illusions! They just aren't what they seem to be; they are not intrinsic, unanalyzable properties of mental states; they are highly structured and complex activated neural networks that dispose us to do all sorts of things in response—such as declare that we're seeing something blue. The key move is to recognize that we have *under*privileged access to the source or cause of our convictions about what we experience" (Rosenberg and Dennett, 2020).

Ironically, while Dennett calls as evidence "user illusions" in his case to deflate consciousness and support materialism, cognitive psychologist Donald Hoffman calls as evidence "user illusions" in his case to inflate consciousness and deny materialism. (16.5). This contrasting interpretation of precisely the same data by two first-rate thinkers is fascinating, perhaps telling.

Dennett is not shy in asserting that people still underestimate by a wide margin the challenges that the brain-in-vat thought experiment raises for views of consciousness other than Dennett's own. The key fact is that "*you don't know anything 'privileged' about the causation of your own thoughts*. You cannot know 'from the inside" what events cause you to think you see something as red or green, for instance, or cause you to push button A instead of button B." In short, to truly understand consciousness, Dennett says "you need to go outside yourself and adopt the 'third-person point of view' of science" (Dennett, 2023a, 2023b).

Dennett stresses the importance of treating subjects' *beliefs* about their own consciousness as "data to be explained, not necessarily as true accounts of mental reality." He states, "This is *the* major fault line in philosophy of mind today, with John Searle, Tom Nagel, David Chalmers, Galen Strawson, and Philip Goff [all represented in this paper], among others, thinking they can just insist they know better. They don't. Those who object, who hold out for some sort of 'first-person science of consciousness,' have yet to describe any experiments or results that are trustworthy but unobtainable by heterophenomenology" (the term Dennett coined for the third-person method, the phenomenology of *other* minds, which is standard procedure in cognitive science). Dennett says his meeting with leading scientific researchers on consciousness enabled him "to begin to form at least vague ideas of how mechanisms of the brain might do all the work," but only, he insists, "if we deflated some of the overconfident pronouncements of introspectors about the marvels of the phenomena" (Dennett, 2023a, 2023b).

In describing his early book, *Content and Consciousness*, where he puts content before consciousness, Dennett differentiates himself from John Searle, who puts consciousness before content. Although Searle and Dennett are both biological naturalists and both, for example, eschew panpsychism, Dennett believes that by prioritizing content, the mystery of consciousness is mitigated.

Dennett has had a long, friendly, though surely adversarial relationship with Chalmers. "Even expert scientists have been fooled by Chalmers' '*the* Hard Problem' into thinking that there's one big mysterious fact that needs explaining, when in fact there are hundreds of lesser problems that can be solved without any scientific revolutions, and when they are all solved, the so-called Hard Problem will evaporate" (Dennett, 2023a, 2023b).

It is worth noting the more general case of a multiple module way of thinking, which posits separate if not independent cognitive components of the mind rooted in the brain (though not needing to correspond to identifiable brain structures). (9.2.5.)

9.2.5. Minsky's society of mind

Artificial intelligence pioneer Marvin Minsky calls the multiple semi-independent modules in the human mind, generated by physically locatable modules in the human brain, *The Society of Mind* (not coincidentally the name of his book). It is a model of human cognition constructed, step by step, from the nonconscious interactions of simple mindless elements he calls "agents" (Minsky, 1986).

"What does it mean to say you're aware of yourself?" Minsky asks. It would be impossible "for any one part of the brain to know what's happening in all the other parts of the brain because there's just too much. Each part of the brain has connections to other parts of the brain and can get some ideas, but there's no place that knows everything" (Minsky, 2007b).

"The Society of Mind," according to Minsky, is the end product of a vast evolutionary history, beginning with just clumps of neurons. Because neurons evolved early and had to keep their physiological integrity, progress was made by neurons gathering together, which led to the first small brains, and when these small brains began to specialize as well as to associate, "mind" began to develop (Minsky, 2007b).

[20] Two witticisms exchanged by Dan Dennett and Dave Chalmers at the 2014 "Toward a Science of Consciousness" conference in Tucson, organized and managed by Stuart Hameroff and co-organized in some years by Chalmers. Dan: "I now know what it feels like to be a policeman at Woodstock." Dave: "Everyone has a crazy theory about the 'hard problem'—even Dan, who says there is no 'hard problem.'"

Minsky is as blunt as he is insightful. "While many neuroscientists focus on how brain cells [neurons] work, to me, that's pretty much like trying to understand a computer from how transistors work. The neurons and synapses are maybe six levels of organization below the thoughts that you're actually aware of, the important things that distinguish a human from a crayfish. These high-level descriptions are what counts, and each of them has to be understood by itself. Any particular thing that happens in Level 5 can be understood as a combination of maybe 20 or 50 things that happen in Level 4 and so forth. But you can't understand Level 5 even if you know everything about how neurons and synapses work. The difference between a human and a crayfish is that a human has these multiple levels of brain organization that the earlier animals did not have" (Minsky, 2007b).

Actually, Minsky says, "I'm interested in how this piece of machine, the brain, can do things like decide that what it's doing isn't working. How does it develop new goals? How does it develop new methods for achieving its goals? And, most important, how does it make a model of itself as a being in a world and think high-level stuff about its own past and its future?"

It has been known for well over 100 years that the brain has many different parts. Minsky envisions something "like a great network of computers, each of which is specialized. It's not that it's a society of little people, but rather a society of biological machines, say 400 or more of these, each with different top-level functions, including the capacity to imagine planning proposals and counterfactual histories."

Minsky speculates that cortical columns of related neurons, which are intermediate in complexity, can store things for a certain period without any changes in probability or conductions. We evolved these structures, he says, "so we could have reliable short-term memories that represent knowledge in many different ways." In context, Minsky advises studying "insulation theory." He says, "Theorists called 'connectionists' say what's important about the brain is how things are connected to each other. You could argue that it's even more important to know how things are insulated from each other—why you don't get a big traffic jam because there's too many connections" (Minsky, 2007b).

9.2.6. *Graziano's attention schema theory*

Advanced by neuroscientist Michael Graziano, attention schema theory asserts that for the brain to handle a profusion of information it must have developed a quick and dirty model, a simplified version of itself, which it then reports "as a ghostly, non-physical essence, a magical ability to mentally possess items" (Graziano, 2019a, 2019b). He likens the attention schema to "a self-reflecting mirror: it is the brain's representation of how the brain represents things, and is a specific example of higher-order thought. In this account, consciousness isn't so much an illusion as a self-caricature."

Graziano claims that this idea, attention schema theory, gives a simple reason, straight from control engineering, for why the trait of consciousness would evolve, namely, to monitor and regulate attention in order to control actions in the world. Thus, Graziano argues that "the attention schema theory explains how a biological, information processing machine can claim to have consciousness, and how, by introspection (by assessing its internal data), it cannot determine that it is a machine whose claims are based on computations" (Graziano, 2019a, 2019b).

9.2.7. *Prinz's neurofunctionalism: how attention engenders experience*

Philosopher Jesse Prinz accounts for consciousness with two main claims: first, consciousness always arises at a particular stage of perceptual processing, the intermediate stage; and second, consciousness depends on attention. "Attention" is Prinz's focus in that it "changes the flow of information allowing perceptual information to access memory systems." Neurobiologically, he says, "this change in flow depends on synchronized neural firing. Neural synchrony is also implicated in the unity of consciousness and in the temporal duration of experience" (Prinz, 2012).

What Prinz calls "attention" is a particular process of making an integrated representation of a stimulus' multiple properties, as perceived from a given point of view, available to working memory—and it is this process, and only this process, that generates consciousness. "Intermediateness," as Prinz's term of art, locates the critical transformation when representations are "integrated into a point-of-view-retaining format that gets made available by this 'attention process'" to working memory. This is why Prinz's theory earns the appellation, "Attended Intermediate Representation Theory" (Mole, 2013). [Note: Prinz's theory could be classified under Representational Theories.]

In exploring the limits of consciousness, Prinz states, "We have no direct experience of our thoughts, no experience of motor commands, and no experience of a conscious self." His strong assertion is that "All consciousness is perceptual, and it functions to make perceptual information available to systems that allow for flexible behavior." Thus, Prinz provides "a neuroscientifically grounded response to the leading argument for dualism," and he argues that "materialists need not choose between functional and neurobiological approaches, but can instead combine these into neurofunctional response to the mind-body problem" (Prinz, 2012).

Prinz encourages a direct, head-to-head competition, as it were, between his neurofunctionalism and David Chalmers's hard problem (Mole, 2013). "Where he [Chalmers] sought to synthesize two decades of dualist argumentation, I [Prinz] try here to synthesize two decades of empirical exploration" (Prinz, 2012; Mole, 2013). Whereas Chalmers famously declares that "no explanation given in wholly physical terms can ever account for the emergence of conscious experience."). Prinz counters that there is now "a satisfying and surprisingly complete theory [contained entirely within materialism] of how consciousness arises in the human brain" (Prinz, 2012).

9.2.8. *Sapolsky's hard incompatibilism*

Neuroendocrinologist and biological anthropologist Robert Sapolsky counts himself as a "hard incompatibilist," affirming the truth of determinism (i.e., all events and actions are the product of prior events and actions) and denying the existence of free will. There is no possibility, he says, "of reconciling our being biological organisms built on the physical rules of the universe with there being free will, a soul, a 'Me' inside there which is somehow free of biology. You have to choose one or the other and, philosophically, I am completely in the direction of us being nothing more or less than our biology (and its interactions with the environment)" (Sapolsky, 2023b).

Sapolsky's target is free will, not consciousness, but to deal with free will, he must deal with consciousness—after all, free will, if it exists, would be a product of consciousness, not the reverse.

But Sapolsky is a reluctant consciousness warrior. Introducing a section of his book labeled "What Is Consciousness?", he enjoys some self-deprecation. "Giving this section this ridiculous heading," he says, seemingly smiling, "reflects how unenthused I am about having to write this next stretch. I don't understand what consciousness is, can't define it. I can't understand philosophers' writing about it. Or neuroscientists', for that matter, unless it's 'consciousness' in the boring neurological sense, like not experiencing consciousness because you're in a coma" (Sapolsky, 2023a).

Referencing the Libet experiments (9.1.2), which purport to dissociate conscious awareness from brain decision-making, Sapolsky argues that "three different techniques, monitoring the activity of hundreds of millions of neurons down to single neurons, all show that at the moment when we believe that we are consciously and freely choosing to do something, the neurobiological die has already been cast. That sense of conscious intent is an irrelevant afterthought." In another context with another metaphor, he calls consciousness "an irrelevant hiccup" (Sapolsky, 2023a).

Yet Sapolsky is not prepared to dismiss consciousness as "just an epiphenomenon, an illusory, reconstructive sense of control irrelevant

to our actual behavior." This strikes me, he says, "as an overly dogmatic way of representing just one of many styles of neuroscientific thought on the subject" (Sapolsky, 2023a).

Pushed to state what he believes consciousness *is*, Sapolsky demurs. "Consciousness is beyond me to understand—every few years I read a review from the people trying to understand it on a neurobiological level, and I cannot understand a word of what they are saying. For me, consciousness arises as a 'complex emergent property'—which explains everything and nothing" (Sapolsky, 2023b).

9.2.9. *Mitchell's free agents*

While neuroscientist Kevin Mitchell argues, contra many scientists and philosophers, that free will, or agency, is not an illusion—that "we are not mere machines responding to physical forces but agents acting with purpose"—he still asserts, "you cannot escape the fact that our consciousness and our behavior emerge from the purely physical workings of the brain" (Mitchell, 2023, p. 3).

Mitchell mounts an evolutionary case for how living beings capable of choice arose from lifeless matter, stressing "the emergence of nervous systems provided a means to learn about the world," thus enabling sentient animals to model, predict, and simulate. These faculties reach their peak in humans with our capacities "to imagine and to be introspective, to reason in the moment, and to shape our possible futures through the exercise of our individual agency" (Mitchell, 2023).

Normally, there is high correlation between those who deny "real" (libertarian) free will with the commitment that consciousness is entirely physical, and conversely, those who affirm "real" (libertarian) free will, are more likely to opt for nonphysical theories. Mitchell is significant in that he defends "real" free will, but unambiguously has consciousness as entirely physical. He describes creaturely acts of what he considers "free will" before consciousness even evolved. "Thoughts are not immaterial," he says; "they are physically instantiated in patterns of neural activity in various parts of the brain … There's no need to posit a 'ghost in the machine'—you're not haunting your own brain. The 'ghost' is the machine at work" (Mitchell, 2023, pp. 267–268).

9.2.10. *Bach's cortical conductor theory*

Cognitive scientist Joscha Bach posits a functional explanation for phenomenal consciousness, the cortical conductor theory (CTC), where "cortical structures are the result of reward-driven learning, based on signals of the motivational system, and the structure of the data that is being learned." Critical is the "conductor," which is "a computational structure that is trained to regulate the activity of other cortical functionality. It directs attention, provides executive function by changing the activity and parameterization and rewards of other cortical structures, and integrates aspects of the processes that it attended to into a protocol. This protocol is used for reflection and learning" (Section: Bach, 2019).

Bach has CTC's "elementary agents" as columns in the cerebral cortex that "self-organize into the larger organizational units of the brain areas as a result of developmental reinforcement learning. The activity of the cortical orchestra is highly distributed and parallelized, and cannot be experienced as a whole." However, its performance is coordinated by the conductor, which is not a homunculus, "but like the other instruments, a set of dynamic function approximators" (situated in prefrontal cortex[21]). Whereas most cortical instruments, he says, "regulate the dynamics and interaction of the organism with the environment (or anticipated, reflected and hypothetical environments), the conductor regulates the dynamics of the orchestra itself." The process is based on signals of the motivational system and it provides executive function, resolves conflicts between cortical agents, and regulates their activities (Bach, 2019).

"The conductor is the only place where experience is integrated," Bach states. "Information that is not integrated in the protocol cannot become functionally relevant to the reflection of the system, to the production of its utterances, the generation of a cohesive self model, and it cannot become the object of access consciousness." Without the conductor, he asserts, our brain can still perform most of its functions, but we would be "sleepwalkers, capable of coordinated perceptual and motor action, but without central coherence and reflection."

Memories empower Bach's theory. "Memories can be generated by reactivating a cortical configuration via the links and parameters stored at the corresponding point in the protocol. Reflective access to the protocol is a process that can itself be stored in the protocol, and by accessing this, a system may remember having had experiential access." For phenomenal consciousness, Bach claims "it is necessary and sufficient that a system can access the memory of having had an experience—the actuality of experience itself is irrelevant."

Phenomenal consciousness, according to Bach, "may simply be understood as the most recent memory of what our prefrontal cortex attended to. Thus, conscious experience is not an experience of being in the world, or in an inner space, but a memory. It is the reconstruction of a dream generated [by] more than fifty brain areas, reflected in the protocol of a single region. By directing attention to its own protocol, the conductor can store and recreate a memory of its own experience of being conscious" (Bach, 2019).

Unlike Integrated Information Theory (12), Bach says CTC is a functionalist model of consciousness, with similarity to other functionalist approaches, such as the ones suggested by Dennett (9.2.4) and Graziano (9.2.6) (Bach, 2019).

9.2.11. *Brain circuits and cycles theories*

Brain circuits and cycles as mechanisms of consciousness are older explanations, no longer considered sufficient in themselves, having evolved into more sophisticated theories. Brain circuits cover the following kinds of large-scale brain structures: lateral pathways across the cerebral cortex linking diverse cortical areas (e.g., especially in the prefrontal, cingulate and parietal regions of the cortex, which are involved in higher-level activities such as planning and reasoning); the reticular activating system focusing attention, shaping behaviors, and stimulating motivation; and vertical thalamocortical radiations mediating sensory and motor systems.[22] Brain cycles cover electroencephalogram (EEG) waves over broad regions of the cerebral cortex, the product of massive numbers of neurons firing synchronously (e.g., gamma waves at 40 Hz).

A contemporary explanation recruits bidirectional information transfer between the cortex and the thalamus—recurrent corticothalamic and thalamocortical pathways—which are said to regulate consciousnesss. Evidence suggests "a highly preserved spectral channel of cortical-thalamic communication that is present during conscious states, but which is diminished during the loss of consciousness and enhanced during psychchedlic states" (Toker et al., 2024).

Dendritic Integration Theory (DIT), linking neurobiology and phenomenology, relates cellular-level mechanisms to conscioius experience by leveraging "the intricate complexities of dendritic processing" in brain circuits. Jaan Aru et al. propose that "consciousness is heavily influenced by, or possibly even synonymous with, the functional integration of two streams of cortical and subcortical information that impinge on different compartments of cortical layer 5 pyramidal (L5p) cells" (Aru, 2023). The biophysical properties of pyramidal cells "allow them to act as gates that control the evolution of global actiatation

[21] Bach notes, "In the human brain, the functionality of the conductor is likely facilitated via the dorsolateral prefrontal cortex, anterior cingulate cortex, and anterior insula. The conductor has attentional links into most regions" (Bach, 2019).

[22] My PhD research at UCLA's Brain Research Institute, under Professor John Schlag, was on the thalamocortical pathway; my thesis title: "An Analysis of Cortical Evoked Potentials and Concomitant Neuronal Population Activity."

patterns," such that "In conscious states, this cellular mechanism enables complex sustained dynamics withn the thalamocortical system, whereas during unconscious states, such signal propagation is prohibiited," Aru et al. suggest that the DIT "hallmark of conscious processing is the flexible integration of bottom-up and top-down data streams at the cellular level" (Aru, 2023, 2020).

9.2.12. Northoff's temporo-spatial sentience

Psychiatrist and neuroscientist Georg Northoff postulates what he calls "sentience" as "a more basic and fundamental dimension of consciousness," and he proposes that sentience arises via "temporo-spatial mechanisms"—characterized by brain activity, spatiotemporal relationship, and structure—with which "the brain constructs its own spontaneous activity [that] are key for making possible the capacity to feel, namely sentience." Northoff's model is based on his supposition that "in addition to the level/state and content of consciousness, we require a third dimension of consciousness, the form or structure or organization of consciousness." Thus, his "temporo-spatial theory of consciousness" leads him to posit "specific neuro-ecological and neuro-visceral mechanisms that are, in their most basic nature, intrinsically temporospatial." We have this capacity to feel and thus for sentience, he says, "because our brain continuously integrates the different inputs from body and environment within its own ongoing temporo-spatial matrix" (Northoff, 2021).

Northoff distinguishes "spatiotemporal neuroscience" from cognitive neuroscience and related branches (like affective, social, etc.) in that spatiotemporal neuroscience focuses on brain activity (rather than brain function), spatiotemporal relationship (rather than input-cognition-output relationship), and structure (rather than stimuli/contents). In this sense, spatiotemporal neuroscience "allows one to conceive the neuro-mental relationship in dynamic spatiotemporal terms that complement and extend (rather than contradict) their cognitive characterization" (Northoff et al., 2020).

Finally, Northoff and colleagues feel "the need to dissolve the mind-body problem (and replace it by the world-brain relation)." They also address other philosophical issues like assuming "time (and space) to be constructed in different scales, small and long, with all different scales being nested (like the different Russian dolls) within each other." For example, "a mental feature may be characterized by an extremely short and restricted spatiotemporal scale which, if abstracted and thereby detached from its underlying longer and more extended scale may seem to be non-dynamic and thus a re-presentation of an event or object. This is like taking one smaller Russian doll out and consider it in isolation from all the others (and, even worse, forgetting that any of the others were ever present)." If, in contrast, they suggest, "one conceives the spatiotemporal scale of mental features in the larger context of other spatiotemporal scales, one can take into view their nestedness." In this view, Northoff has mental features as "nothing but a small Russian doll that is nested within the longer and more extended scales of the brain's spontaneous activity (which, by itself, is nested within the yet much larger spatiotemporal scales of body and world)" (Northoff et al., 2020).

9.2.13. Bunge's emergent materialism

Philosopher and physicist Mario Bunge rejects any "separate mental entity," calling it "a stumbling block to progress." It is "unwarranted by the available data and the existing psychological models," he says, and it collides "head-on with the most fundamental ideas of all modern science." Rather, Bunge argues that the mind-body problem requires a psychobiological approach, based on the assumption that behavior is an external manifestation of neural processes—an approach that also abandons ordinary language in favor of a "state space language, which is mathematically precise and is shared by science and scientific philosophy" (Bunge, 1980; 2014). More broadly, he presents a systematic model of mankind as a "biopsychosocial entity" and he favors "the multilevel approach" over "the holistic, the analytic, and the synthetic approaches" (Bunge, 1989).

Upfront, Bunge defines his idiosyncratic position: "I am an unabashed monist''—his objective is "to reunite matter and mind"—and "I am a materialist but not a physicalist.'' By the latter distinction, Bunge means that while the material world is all there is (i.e., there are no nonmaterial substances), the laws of physics cannot explain all phenomena (i.e., "physics can explain neither life nor mind nor society") (Bunge, 2011; Slezak, 2011).

Bunge calls his theory, or more precisely, his "programmatic hypothesis," about the mind-body problem "emergent materialism"—his core concept being that "mental states form a subset (albeit a very distinguished one) of brain states (which in turn are a subset of the state space of the whole animal)." The hypothesis is unambiguously materialist, even though "biosystems, including their mental states, have properties that are not reducible to their physical and chemical properties." Mind, according to Bunge, "is just a collection of functions (activities, events) of an extremely complex central nervous system." Mental states are distinguished from brain states broadly in that mental states reflect only those brain states that exhibit neural plasticity, especially learning, in contrast to brain states that are more phylogenetically fixed (Bunge, 1980; 2014).

Approaching the mind-body problem as a general systems theorist, Bunge shows, in particular, "how the concept of a state space can be used to represent the states and changes of state of a concrete thing such as the central nervous system." He stresses the concept of emergence—he defines an emergent property as "a property possessed by a system but not by its components." He then focuses on the level where such emergence occurs, arguing that "the mental cannot be regarded as a level on a par with the physical or the social." The upshot, he says, is "a rationalist and naturalist pluralism." While he rejects Dualism (15) as both untestable and contradictory to science, he also rejects Eliminative Materialism (9.1.1) and reductive materialism (9.1.7) "for ignoring the peculiar (emergent) properties of the central nervous system." He opts for "emergentist materialism" as a variety of "psychoneural monism," but cautions that it needs detailed mechanisms, especially mathematical ones (Bunge, 1977).

Bunge trains his delightfully acerbic guns on choice theories: computationalism ("a sophisticated version of behaviorism," "brainless cognitive science"); studying higher level mental phenomena rather than neuroscience and "objective brain facts'' ("Cartesian mind-body dualism," "psychoneural dualism"); philosophical zombies ("responsible people do not mistake conceptual possibility, or conceivability, for factual possibility or lawfulness; and they do not regard the ability to invent fantasy worlds as evidence for their real existence''); and panpsychism ("illustrates the cynical principle that, given an arbitrary extravagance, there is at least one philosopher capable of inventing an even more outrageous one'') (Slezak, 2011; Bunge, 2011).

Bunge also criticizes that "the division of scientific labor has reached such a ridiculous extreme that many workers in neuroscience and psychology tend to pay only lip service to the importance of studies in development and evolution for the understanding of their subject." Such neglect of development and evolution, he says, has had at least three undesirable consequences: 1) overlooking the biological maturation of the central nervous system (e.g., the corpus callosum takes up to a decade to develop); 2) exaggerating leaps at the expense of graduality (particularly of the information-processing variety); and conversely, 3) exaggerating continuity at the expense of quantitative novelty (animal psychologists who claim that human mental abilities differ only in degree from prehuman ones) (Bunge, 1989).

In sum, to explain behavior and mentation in scientific terms, Bunge calls for a synthesis or merger of neuroscience and social science, rather than for a reduction, "even though the behavioral and mental processes are neurophysiological." Put philosophically, "this is a case of ontological reduction without full epistemological reduction" (Bunge, 1989).

9.2.14. Hirstein's mindmelding

William Hirstein argues that it is "the assumption of privacy"—the

deep, metaphysical impossibility for one person to ever experience the conscious states of another—that has led philosophers and scientists to claim wrongly that the conscious mind can never be explained in straightforwardly physical terms and thus to "create vexing dualisms, panpsychisms, views that would force changes in our current theories in physics, views that deny the reality of consciousness, or views that claim the problem is insoluble." Hirstein seeks to undermine "the assumption of privacy" by the thought experiment of "mindmelding": connecting one person's cerebral cortex control network to another person's cerebral cortex visual attention network. This would entail inter-brain rather than the normal intra-brain coupling. Then the first person might correctly say, "Wow, I am experiencing your conscious visual states. Did you know you are color blind?" The control network functions as a referent for "I"—the subject of the visual states—and the other person's conscious visual states are the referent for "your conscious visual states." As such, mindmelding would support phenomenal consciousness as entirely physical, realizable in terms of neurobiology, which would be both necessary and sufficient (Hirstein, 2012).

9.3. Electromagnetic field theories

Electromagnetic (EM) Field Theories treat minds as identical to, or derivative from, the broader, brain-spanning EM fields generated by the cumulative aggregate of multiple, specific neural currents. The brain is packed with an intricate three-dimensional web of these EM fields—the question is what functions do these EM fields serve (if any), and whether these fields in any way relate to consciousness?

Diverse studies are said to support an EM field theory. For example, "transient periods of synchronization of oscillating neuronal discharges in the frequency range 30–80 Hz (gamma oscillations) have been proposed to act as an integrative mechanism that may bring a widely distributed set of neurons together into a coherent ensemble that underlies a cognitive act." Transitions between the moment of perception and the motor response are marked by periods of strong desynchronization, which suggests "a process of active uncoupling of the underlying neural ensembles that is necessary to proceed from one cognitive state to another" (Rodriguez, 1999).

The stability of working memory is said to emerge at the level of the electric fields that arise from neural activity, more than from the specific neural activity itself, as "the exact neurons maintaining a given memory (the neural ensemble) change from trial to trial." In the face of this "representational drift," electric fields carry information about working memory content, enable information transfer between brain areas and "can act as 'guard rails' that funnel higher dimensional variable neural activity along stable lower dimensional routes" (Pinotsis and Miller, 2022).

Electric fields, applied externally, have been shown to modulate pharmacologically evoked neural network activity in rodent hippocampus and to enhance and entrain physiological neocortical neural network activity (i.e., neocortical slow oscillation) in vitro as a model system. Both show the neural efficacy of weak sinusoidal and naturalistic electric fields (Fröhlich and McCormick, 2010).

Neuroinformatics/EEG neuroscientists Andrew and Alexander Fingelkurts formulate a framework of "Operational Architectonics (OA) of Brain-Mind Functioning," where "consciousness is an emergent phenomenon of coherent but dynamic interaction among operations produced by multiple, relatively large, long-lived and stable, but transient neuronal assemblies in the form of spatiotemporal patterns within the brain's electromagnetic field." OA's architectural structure is "characterized by a nested hierarchy of operations of increasing complexity: from single neurons to synchronized neuronal assemblies and further to the operational modules of integrated neuronal assemblies." Conscious phenomena are "brought to existence" by the brain generating a "dynamic, highly structured, extracellular electromagnetic field in spatiotemporal domains and over a wide frequency range." Neurophysiological substrates of single operations (standing electromagnetic fields), produced by different neuronal assemblies, "present different qualia or aspects of the whole object/scene/concept." At the same time, "the wholeness of the consciously perceived or imagined is a result of synchronized operations (electromagnetic fields) of many transient neuronal assemblies in the form of dynamic and ever-increasing spatiotemporal patterns termed Operational Modules (OM)"—where new OM configurations generate an almost infinite number and complexity of phenomenal qualities, patterns, and objects (Fingelkurts, 2024; Fingelkurts et. al., 2019, 2020).

Adding credence to electromagnetic field theories are recent discoveries of large-scale, cerebral cortex-wide interacting spiral wave patterns of brain waves that are said to underlie complex brain dynamics and are related to cognitive processing. That the human brain exhibits rich and complex electromagnetic patterns, with brain spirals propagating across the cortex and giving rise to spatiotemporal activity dynamics with non-stationary features and having functional correlates to cognitive processing, would be consistent with their role in consciousness (Xu et al., 2023).

9.3.1. Jones's electromagnetic fields

Philosopher Mostyn Jones gathers, explains and classifies various electromagnetic-field theories, each with its own theoretical foundation: computationalist, reductionist, dualist, realist, interactionist, epiphenomenalist, globalist, and localist. He uses three questions to classify the field theories: 1. How do minds exist relative to fields? 2. Are minds unified by global or local fields? 3. How extensively do fields and neurons interact? (Jones, 2013).

The claim is made that electromagnetic fields in the brain can solve the "binding problem," where distinct sensory modules combine to give a unified sense of phenomenal experience—say, melding the red and roundness of a balloon into a single percept. For example, there doesn't seem to be a single synthesizing brain area into which all visual circuits feed, nor any well-known cortical circuits that bind (unite) color and shape to form unified images. However, perceptual binding does seem to involve the synchronized firing of circuits in unified lockstep (with a temporal binding code) for specific sensory modalities (e.g., shape), but neurons in color and shape circuits don't synchronize. Mostyn states that "while binding involves synchrony, binding seems to be more than synchrony," thus giving field theories the opening to unify visual experience via a single field, not by a single brain area or by synchrony (yet synchrony does amplify field activity) (Jones, 2013).

Mostyn claims that evidence is mounting that unified neural electromagnetic fields interact with neuronal cells and circuits to explain correlations and divergences between synchrony, attention, convergence, and unified minds, and that the simplest explanation for the unity of minds and fields is that minds are fields (Jones, 2017). Moreover, some electromagnetic-field theorists even put qualia itself on the explanatory agenda (Jones, 2013).

Jones poses "neuroelectrical panpsychism" (NP) as "a clear, simple, testable mind–body solution" based on the conjunction of its two component theories: (i) "everything is at least minimally conscious," and (ii) "electrical activity across separate neurons creates a unified, intelligent mind." According to Jones, NP is bolstered by neuroelectrical activities that generate different qualia, unite them to form perceptions and emotions, and help guide brain operations. He claims, ambitiously, that "NP also addresses the hard problem of why minds accompany these neural correlates." He offers the radical identity that "the real nature of matter-energy (beyond how it appears to sense organs) is consciousness that occupies space, exerts forces, and unites neuroelectrically to form minds." He also has NP solving panpsychism's combination problem "by explaining how the mind's subject and experiences arise by electrically combining simple experiences in brains" (Jones, 2024).

9.3.2. Pockett's conscious and non-conscious patterns

Psychologist Susan Pockett's electromagnetic field theory of

consciousness proposes that "while conscious experiences are identical with certain electromagnetic patterns generated by the brain" have always been acknowledged, it is critical to "specify what might distinguish conscious patterns from non-conscious patterns … the 3D shape of electromagnetic fields that are conscious, as opposed to those that are not conscious." She calls this "a testable hypothesis about the characteristics of conscious as opposed to non-conscious fields" (Pockett, 2012).

Moreover, Pockett argues that the central dogma of cognitive psychology that "consciousness is a process, not a thing" is "simply wrong." All neural processing is unconscious, she asserts. "The illusion that some of it is conscious results largely from a failure to separate consciousness per se from a number of unconscious processes that normally accompany it—most particularly focal attention. Conscious sensory experiences are not processes at all. They are things: specifically, spatial electromagnetic (EM) patterns, which are presently generated only by ongoing unconscious processing at certain times and places in the mammalian brain, but which in principle could be generated by hardware rather than wetware" (Pockett, 2017).

9.3.3. *McFadden's conscious electromagnetic information theory*

Molecular geneticist Johnjoe McFadden proposes conscious electromagnetic information (CEMI) field theory as an explanation of consciousness. His central claim is that "conventional theories of consciousness (ToCs) that assume the substrate of consciousness is the brain's neuronal matter fail to account for fundamental features of consciousness, such as the binding problem," and he posits that the substrate of consciousness is best accounted by the brain's well-known electromagnetic (EM) field (McFadden, 2023).

Electromagnetic field theories of consciousness (EMF-ToCs) were first proposed in the early 2000s primarily to account for the experimental discovery that synchronous neuronal firing was a strong neural correlate of consciousness (NCC) (McFadden, 2002). While McFadden has EMF-ToCs gaining increasing support, he recognizes that "they remain controversial and are often ignored by neurobiologists and philosophers and passed over in most published reviews of consciousness." In his own review, McFadden examines EMF-ToCs against established criteria for distinguishing between competing ToCs and argues that "they [EMF-ToCs] outperform all conventional ToCs and provide novel insights into the nature of consciousness as well as a feasible route toward building artificial consciousnesses" (McFadden, 2023).

McFadden references the neurophysiology of working memory in support of CEMI theory. He states that "although the exact neurons (the neural ensemble) maintaining a given memory in working memory varies from trial to trial, what is known as representational drift, stability of working memory emerges at the level of the brain's electric fields as detected by EEG." This means, he argues that "since working memory is considered to be, essentially, conscious memory," consciousness "resides in the brain's electromagnetic fields rather than in its neurons, acting as the brain's global workspace." He asserts that "the higher level of correlation between the contents of working memory and the brain's EM fields, rather than the state of the brain's matter-based neurons, is a considerable challenge to all neural-ToCs" (McFadden, 2023).

McFadden positions CEMI field theory (or EMF-ToCs) as providing "an objective criterion for distinguishing conscious from non-conscious EM fields. This arises from the requirement that, to be reportably conscious, a system must be able to generate (rather than merely transmit) thoughts as gestalt (integrated) information—our thoughts—that can be communicated to the outside world via a motor system" (McFadden, 2023).

In distinguishing CEMI field theory from Integrated Information Theory (12), McFadden argues that "nearly all examples of so-called 'integrated information', including neuronal information processing and conventional computing, are only temporally integrated in the sense that outputs are correlated with multiple inputs: the information integration is implemented in time, rather than space, and thereby cannot correspond to physically integrated information." He stresses that "only energy fields are capable of integrating information in space" and he defines CEMI field theory whereby "consciousness is physically integrated, and causally active, [with] information encoded in the brain's global electromagnetic (EM) field." Moreover, he posits that "consciousness implements algorithms in space, rather than time, within the brain's EM field," and he describes CEMI field theory as "a scientific dualism that is rooted in the difference between matter and energy, rather than matter and spirit" (McFadden, 2020).

9.3.4. *Ephaptic coupling*

An ephaptic coupling theory of consciousness leverages the idea that neurons, being electrogenic, produce electric fields, which, if sufficiently strong and precisely placed, can influence the electrical excitability of neighboring neurons near-instantaneously (Chen, 2020). Assuming that ephaptic coupling occurs broadly in the brain, it could support, or even help constitute, an electromagnetic field theory of consciousness.

Experiments show that a neural network can generate "sustained self-propagating waves by ephaptic coupling, suggesting a novel propagation mechanism for neural activity under normal physiological conditions." There is clear evidence that "slow periodic activity in the longitudinal hippocampal slice can propagate without chemical synaptic transmission or gap junctions, but can generate electric fields which in turn activate neighboring cells." These results "support the hypothesis that endogenous electric fields, previously thought to be too small to trigger neural activity, play a significant role in the self-propagation of slow periodic activity in the hippocampus" (Chiang et al, 2019).

Ephaptic coupling of cortical neurons, independent of synapses, has been demonstrated by stimulating and recording from rat cortical pyramidal neurons in slices. Results showed that extracellular fields, despite their small size, "could strongly entrain action potentials, particularly for slow (<8 Hz) fluctuations of the extracellular field," indicating that "endogenous brain activity can causally affect neural function through field effects under physiological conditions" (Anastassiou et al., 2011).

Mesoscopic ephaptic activity in the human brain has been explored, including its trajectory during aging, in a sample of 401 realistic human brain models from healthy subjects aged 16–83. "Results reveal that ephaptic coupling … significantly decreases with age, with higher involvement of sensorimotor regions and medial brain structures. This study suggests that by providing the means for fast and direct interaction between neurons, ephaptic modulation may contribute to the complexity of human function for cognition and behavior" (Ruffini et al., 2020).

9.3.5. *Ambron's local field potentials and electromagnetic waves*

Biologist and pain researcher Richard Ambron suggests that understanding the specific consciousness of pain might help to understand the mechanism of consciousness in general. Pain is ideal for studying consciousness, he says, because it receives priority over all other sensations, reflecting its criticality for survival (Ambron, 2023a, 2023b; Ambron and Sinav, 2022).

Pain starts at the site of injury where damaged cells release small molecular compounds that bind to the terminals of peripheral neurons and trigger action potentials which encode information about the injury. The greater the severity of the injury, the greater the number and frequency of action potentials, and the greater the intensity of pain.

The pain pathway is well documented: from periphery to spinal cord to the thalamus, where we first become aware of the injury but do not feel the affect of onerous pain. Rather, the region for feeling the hurtfulness of pain is the anterior cingulate cortex (ACC), where input from the thalamus activates a complex neuronal circuit. Essential are the pyramidal neurons, which have a triangular cell body and a long

dendrite with many branches that are vital for experiencing pain.

Because information transmitted between neurons must traverse the minuscule space between them—the synapse—axons from thalamic neurons transmit to dendrites of ACC neurons by releasing a neurotransmitter that traverses the gap, binds to the dendritic endings and triggers action potentials. When there is prolonged activity at the synapse in response to a serious injury, the synapses become "hyperresponsive" and strengthened. This strengthening, called long-term potentiation (LTP), sensitizes the synapse so that it takes fewer action potentials to cause pain. This is why even a gentle touch to the site of an injury will hurt (Ambron, 2023a, 2023b; Ambron and Sinav, 2022).

In addition to housing circuits for pain, the ACC receives information from other brain regions. For example, inputs from the amygdala can increase the intensity of the pain due to anxiety or fear, whereas those from the nucleus accumbens can reduce the pain if the reward for bearing the pain is considered worthwhile. Thus, what we experience as pain depends on interactions among several areas of the brain.

To maintain electro-neutrality after an injury, there is an efflux of positive ions from the cell body that forms a local field potential (LFP) and creates electromagnetic (EM) waves in the extracellular space around the pyramidal neurons. In Ambron's novel move, he posits that these EM waves now contain the information about the pain that was previously encoded in the action potentials. In other words, the pain information was transferred from action potentials to LFPs to EM waves, which could influence nearby circuits, such as those for attention.

Ambron speculates that these EM waves contribute to consciousness. Assuming information from other senses is also transformed into EM waves, it also might help solve the "binding/combination problem," because integrating information from all the waves could explain how individual sensory inputs combine to create "a unified, coherent version of the world." Unlike most theories of consciousness, Ambron believes his hypothesis can be tested (Ambron, 2023a, 2023b).

9.3.6. *Llinas's mindness state of oscillations*

Neuroscientist Rodolfo Llinas's theory of the "mindness state" is centered on the concept of oscillations. Many neurons possess electrical activity, manifested as oscillating variations in the minute voltages across the cell membrane. On the crests of these oscillations occur larger electrical events that are the basis for neuron-to-neuron communication. Like cicadas chirping in unison, a group of neurons oscillating in phase can resonate with a distant group of neurons. This simultaneity of neuronal activity, Llinas maintains, is the neurobiological root of cognition. Although the internal state that we call the mind is guided by the senses, it is also generated by the oscillations within the brain. Thus, in a certain sense, Llinas would say that reality is not all "out there," but is a kind of virtual reality (Llinas, 2002, 2007).

9.3.7. *Zhang's long-distance light-speed telecommunications*

Synaptic neuroscientist Ping Zhang suggests that "the long-time puzzle between brain and mind" might be solved by "a light-speed telecommunication between remote cells that are arranged in parallel." He bases his theory on "the law of synchronization," where "all the individuals are connected to each other rigidly (or in a light-speed momentum network), energy radiated from one individual will be propagated to and conserved in all other individuals in light speed" (Zhang, 2019).[23]

In explaining "how a 'school' of neurons in human brain behaves like a light-speed rigid network and concentrates on a task," Zhang cites his own observation of "the traveling electrical field mediated transmission of action potentials between excitable cells with the cell-cell distance more than 10 mm (an anatomically astronomical distance in cortex)." Moreover, "when longitudinal cells are arranged in parallel separately, the action potential generated from one cell can 'jump' to other cells and cause all the cells to fire action potentials in concert. If two cells fire action potentials spontaneously and have their own rhythm, they tend to 'learn' from each other, adjust their own pace, eventually lock their phases, and 'remember' this common rhythm for a long while" (Zhang, 2019).

Zhang notes, "unlike synaptic neuronal network, which is a physiological transmission with the velocity of 0.2–120 m/s (synaptic delay period is not included), traveling electrical field mediated transmission … [has] the velocity of light speed." In a cortical circuit, he says, "the synaptic elements provide delicate and precise connections; while the traveling electrical field, may provide transient, rapid, flexible rather than fixed connections to synchronize rhythmic action potentials fired from axons which are arranged in parallel and are well insulated by dielectric media."

How does "this invisible 'tele' bridge-linked synchronization or harmony" work? According to Zhang, neural action potentials in human brain circuits produce clusters of traveling electrical fields. Those with similar frequency tend to be synchronized. Integration, imagination, remembering, creating, etc. require considerable energy, and if these processes are simply synchronizations between different brain regions, the energy conserving property of sync facilitates performing these mental activities.

Having worked on synaptic transmission for 20 years, Zhang muses: "Glutamate receptors, for instance, are found in both human and crayfish synapses. Human receptors are not any 'smarter' than those of crayfish." It would be very narrow minded, he says, "to study human synapses, which evolved from those of squid and crayfish, hoping to find a magic thinking molecule." If there is no super-highway (light speed) above the traditional synaptic networks, he concludes, "I just cannot imagine how people can be an intelligent life-form" (Zhang, 2019).

9.4. *Computational and Informational Theories*

Computation and Information Theories feature advanced computational structures, resonance systems, complex adaptive systems, information-theory models, and mathematical models, all of which are held, in whole or in part, as theories of consciousness.

9.4.1. *Computational theories*

Computational theories of mind developed organically as the processing power of computers expanded exponentially to enable the emulation of mind-like capabilities such as memory, knowledge structure, perception, decision-making, problem solving, reasoning and linguistic comprehension (especially with the advent of human-like large language models like ChatGPT). The growing field of cognitive science owes its development to computational theories (Rescorla, 2020).

There is a reciprocal, recursive, positive-feedback relationship as computational theories of mind seek both to enhance the power and scope of computing and to advance understanding of how the human mind actually works. Classical computational theories of mind, which exemplify functionalism (9.1.3), are based on algorithms, which are routines of systematic, step-by-step instructions, and on Turing machines, which are abstract models of idealized computers with unlimited memory and time that process one operation at a time (with super-fast but not unlimited speed).

Artificial intelligence adds logic, seeking to automate reasoning—deductive at first, then inductive and higher-order forms. Neural networks, with a connectionism construct, were a step-function advance. For example, chess computers have reigned supreme since 1997 when Deep Blue defeated the world chess champion, Gary Kasparov. But whereas the process has been literally massive brute-force calculations—hundreds of millions of "nodes" per second (a "node" is

[23] Zhang adds, "Energy radiated from all individuals [in a synchronized system] will be fed back to each individual at exactly the same time. Energy states of all individuals tend to even up; entropy increase tends to be maximal when sync is established; one's energy output is another's energy input. The system tends to be energy conservatively beneficial and stable" (Zhang, 2019).

a chess position with its evaluation and history)—recent advances in algorithmic theory are dramatically improving capabilities. The implications go way beyond chess and are apparent.

Philosopher-futurist Nick Bostrom espouses a computational theory of consciousness, which is consistent with his view that there is a distinct possibility that our world and universe, our total state of affairs, is a computer simulation (Bostrom, 2003, 2006). The logic is almost a tautology: A computer simulation would require, by definition, that our consciousness, and the consciousnesses of all sentient creatures, would be, ipso facto, computational consciousness. Of course, Bostrom does not argue that we *are* living in a simulation, so his computationalism as a theory of consciousness is motivated by other factors, including computational neuroscience. In fact, one could make the case that the arrow of causal explanation points in the reverse direction: Consciousness as computational would need to be a condition precedent, necessary but not sufficient, for the simulation argument to be coherent.

Computer/AI scientist James Reggia explains that efforts to create computational models of consciousness have been driven by two main motivations: "to develop a better scientific understanding of the nature of human/animal consciousness and to produce machines that genuinely exhibit conscious awareness." He offers three conclusions: "(1) computational modeling has become an effective and accepted methodology for the scientific study of consciousness; (2) existing computational models have successfully captured a number of neurobiological, cognitive, and behavioral correlates of conscious information processing as machine simulations; and (3) no existing approach to artificial consciousness has presented a compelling demonstration of phenomenal machine consciousness, or even clear evidence that artificial phenomenal consciousness will eventually be possible" (Reggia, 2013).

Computer scientist Kenneth Steiglitz argues that all available theories of consciousness "aren't up to the job" in that "they don't tell me how I can know whether a particular candidate is or is not phenomenally conscious." Moreover, he says, we will never be able to answer the question of AI consciousness—because "it is simply not possible to test for consciousness." This presents, Steiglitz worries, dangers of two kinds: (1) damaging or even destroying our own consciousness, and (2) bringing about new consciousness that will not be treated with proper respect and quite possible suffer (Steiglitz, 2024).

Steiglitz states three principles of what we think we know about consciousness—the dual nature of mind and body, the dependence of mind on body, and the dependence of mind on computation—and he calls them all *absurd*, because "these do not follow from physics, biology, or logic." He muses, "I wish I had a theory to account for consciousness—but I don't see how any theory could" (Steiglitz, 2024).

Philosophy-savvy attorney Andrew Hartford proposes an EP (Eternal Past) Conjecture such that "If there ever is something there *always* was something, because no-thing comes from Nothing," and that "the always existor exists before all time, process or computation." What follows, he says, is that while "it remains to be seen whether artificial consciousness is in the domain of all possibilities, we should not presume that we will necessarily build computational consciousness" (Hartford, 2014).

The mildly dismissive critique is that the computational theory of mind follows the historical trend of analogizing the mind to "the science of the day,".[24]

9.4.2. Grossberg's adaptive resonance theory

To computational neuroscientist Stephen Grossberg, "all conscious states are resonant states." The conscious brain is the resonant brain where attentive consciousness regulates actions that interact with learning, recognition, and prediction (Grossberg, 2019). Grossberg's idea is that the mind is an activity, not a thing, a verb not a noun—it's what you do, not what you have or use. His theoretical foundation is "Adaptive Resonance Theory" (ART), a cognitive and neural concept of how the brain autonomously learns to consciously attend, learn, categorize, recognize, and predict objects and events in a changing world (Grossberg, 2013). Central to ART's predictive power is its ability to carry out fast, incremental, and stable unsupervised and supervised learning in response to external events.

ART specifies mechanistic links in advanced brains that connect processes regulating conscious attention, seeing, and knowing, with those regulating looking and reaching. Consciousness thus enables learning, expectation, attention, resonance, and synchrony during both unsupervised and supervised learning. These mechanistic links arise from basic properties of brain design principles such as complementary computing, hierarchical resolution of uncertainty, and adaptive resonance. These principles, recursively, require conscious states to mark perceptual and cognitive representations that are complete, context sensitive, and stable enough to control effective actions (Grossberg, 2019).

Foundational to Grossberg's way of thinking is the idea that all biological processes, notably our brains, self-organize, and that all cellular systems illustrate variations of a universal developmental code. All these processes are regulated using physically different instantiations of mechanistically similar laws of short-term memory or activation, and long-term memory or learned memory, that are conserved across species, including in our brains (Grossberg, 2021).

Resonance in the brain comes about via bottom-up patterns interacting with learned top-down expectations, leading to a persistent resonant state that can also lead to conscious awareness when it includes feature-selective cells that represent qualia. In this way, Grossberg uses ART to explain many mind and brain data about how humans consciously see, hear, feel, and know things (Grossberg, 2023).

At the risk of oversimplification, Grossberg's unified theory of mind has three "laws" of consciousness: (i) All conscious states are resonant states; (ii) only resonant states with feature-based representations can become conscious; (iii) multiple resonant states can resonate together. He believes that the varieties of brain resonances and the conscious experiences that they support make progress towards solving the hard problem of consciousness (Grossberg, 2017).

9.4.3. Complex adaptive systems models

A complex adaptive system (CAS) is a dynamic network of interactions whose collective behavior may not be predictable from its component behaviors and that can "adapt" or alter its individual and collective behavior, creating novelties. A CAS works, broadly, via kinds of mutation and self-organizing principles related to change-initiating events at different levels of its organizational structure (from micro to collective), motivated in a loose sense by kinds of rules or trophisms (Complex Adaptive System, 2023).

The application of CAS to consciousness can be argued from two perspectives. First, because the brain is a classic CAS in that it is the most complex system in the known universe—the brain has roughly (order of magnitude) 100 billion neurons and one quadrillion (10^{15}) connections—with constant adaptations and emergences of novel functions or activities, and because consciousness is the output of the brain, therefore consciousness is a CAS.

Second, characteristics of consciousness per se are characteristics of a CAS: interactions are non-linear and chaotic in that small changes in inputs can cause large changes in outputs (e.g., minor physical or psychological stimuli can trigger major behavioral responses); histories are relevant for current and future evolution of the system; thresholds are critical for initiating new actions; interactions can be recursive and unpredictable; and the system is open such that boundaries may not be definable (Rose, 2022).

Understanding consciousness as an intelligent CAS may affect how we assess its impact on its environment; for example, how anthropology

[24] Closer To Truth videos on Computational Theory of Mind, including Rodney Brooks, Andy Clark, Donald Hoffman, Susan Greenfield, Peter Tse, Anirban Bandyopadhyay, Ken Mogi—https://closertotruth.com/video/broro-003/?referrer=8107.

conceives of culture (Laughlin, 2023). Consciousness may be modeled as an intelligent CAS where intelligence means solving problems by mediating between sensory input and behavioral output. Evolution of an intelligent CAS is said to result in emergent properties.

9.4.4. Critical brain hypothesis

According to biophysicist John Beggs, the Critical Brain Hypothesis "suggests that neural networks do their best work when connections are not too weak or too strong." This intermediate "critical" case avoids "the pitfalls of being excessively damped or amplified." In criticality, the brain capacity for transmitting more bits of information is enhanced (Beggs, 2023).

The hypothesis posits that the brain operates optimally near the critical point of phase transitions, oscillating between subcritical, critical, and modestly supercritical conditions. "The brain is always teetering between two phases, or modes, of activity," Beggs explains; "a random phase, where it is mostly inactive, and an ordered phase, where it is overactive and on the verge of a seizure." The hypothesis predicts, he says, that "between these phases, at a sweet spot known as the critical point, the brain has a perfect balance of variety and structure and can produce the most complex and information-rich activity patterns. This state allows the brain to optimize multiple information processing tasks, from carrying out computations to transmitting and storing information, all at the same time" (Beggs, 2023).

The Critical Brain Hypothesis traces its origin to physicist Per Bak, who suggests that "the brain exhibits 'self-organized criticality,' tuning to its critical point automatically. Its exquisitely ordered complexity and thinking ability arise spontaneously … from the disordered electrical activity of neurons." Founding his ideas on statistical mechanics, Bak hypothesizes that, "like a sandpile, the network balances at its critical point, with electrical activity following a power law. So when a neuron fires, this can trigger an 'avalanche' of firing by connected neurons, and smaller avalanches occur more frequently than larger ones" (Ouellette, 2018).

The same sense of a critical brain being "just right," Beggs says, also explains why information storage, which is driven by the activation of groups of neurons called assemblies, can be optimized. "In a subcritical network, the connections are so weak that very few neurons are coupled together, so only a few small assemblies can form. In a supercritical network, the connections are so strong that almost all neurons are coupled together, which allows only one large assembly. In a critical network, the connections are strong enough for many moderately sized groups of neurons to couple, yet weak enough to prevent them from all coalescing into one giant assembly. This balance leads to the largest number of stable assemblies, maximizing information storage" (Beggs, 2023).

Beggs claims that "experiments both on isolated networks of neurons and in intact brains have upheld many of these predictions" derived from networks operating near the critical point, especially in the cortex of different species, including humans. For example, it is possible to disrupt the critical point. "When humans are sleep deprived, their brains become supercritical, although a good night's sleep can move them back toward the critical point." It thus appears, he suggests, that "brains naturally incline themselves to operate near the critical point, perhaps just as the body keeps blood pressure, temperature and heart rate in a healthy range despite changes to the environment" (Beggs, 2023).

Two challenges are identified: (i) how is criticality maintained or "fine-tuned" in a biological environment (Ouellette, 2018), and (ii) "distinguishing between the apparent criticality of random noise and the true criticality of collective interactions among neurons" (Beggs, 2023).

9.4.5. Pribram's holonomic brain theory

Neurosurgeon/neuroscientist Karl Pribram's Holonomic Brain Theory is the novel idea that human consciousness comes about via quantum effects in or between brain cells such that the brain acts as a holographic storage network (building on theories of holograms formulated by Dennis Gabor). ("Holonomic" refers to representations in a Hilbert phase space defined by both spectral and space-time coordinates.) (Section: Holonomic brain theory, 2023).

Holograms are three-dimensional images encoded on two-dimensional surfaces and Pribram's claim is that this counterintuitive capacity is fundamental in explaining consciousness. (There is precedent in that the holographic principle in quantum cosmology describes black hole entropy and information, with applications in string theory and quantum gravity [Holographic principle, 2024].)

Holograms are generated from patterns of interference produced by superimposed wavefronts, created by split beams of coherent radiation (i.e., lasers) that are recorded and later re-constructed. A prime characteristic is that every part of the stored information is distributed over the entire hologram. Even if most parts of the hologram are damaged, as long as any part of the hologram is large enough to contain the interference pattern, that part can recreate the entirety of the stored image (but if the image is too small it will be noisy, blurry)

The application of holographic models to consciousness was inspired by this non-locality of information storage within the hologram. It was Karl Pribram who first noted the similarities between an optical hologram and memory storage in the human brain, extrapolating what psychologist Karl Lashley had discovered about the wide distribution of memory in the cerebral cortex of rats following diverse surgical lesions. Pribram had worked with Lashley on Lashley's engram experiments, which sought to determine exact locations of specific memories in primate brains by making small lesions. The surprising result was that these targeted extirpations had little effect on memory. In contrast, removing large areas of cortex caused multiple serious deficits in memory and cognitive function. The conclusion was a milestone in neuroscience: Memories are not stored in a single circuit or exact location, but were spread over the entirety of a neural network. Thus, according to Holonomic Brain Theory, memories are stored in holographic-like fashion within certain general regions, but stored non-locally within those regions. This enables the brain to maintain function and memory even after it is damaged. (This can explain why some children retain normal intelligence when large portions of their brains—in some cases, half—are removed.) (Holonomic brain theory, 2023).

More fundamentally, Holonomic Brain Theory conjectures that consciousness is formed by quantum events within or between neurons. This early theory of quantum consciousness, which Pribram developed initially with physicist David Bohm, combines quantum biology with holographic storage. Pribram suggests these processes involve electric oscillations in the brain's fine-fibered dendritic webs, which differ from the commonly accepted action potentials along axons and traversing synapses. These oscillations are waves and create wave interference patterns in which memory is encoded such that a piece of a long-term memory is similarly distributed over a dendritic arbor. The remarkable result is that each part of the dendritic network contains all the information stored over the entire network—a mechanism that maps well onto laser-generated holograms. Thus, Holonomic Brain Theory is said to enable distinctive features of consciousness, including the fast associative memory that connects different pieces of stored information and the non-locality of memory storage (a specific memory is not stored in a single location; there is no dedicated group or circuit of specific neurons) (Holonomic brain theory, 2023).

Although Holonomic Brain Theory has not come to threaten mainstream neuroscience, it has intriguing features that should be explored. I don't hold it against the theory that it has stimulated unusual and creative speculations; for example, holographic duality and the physics of consciousness (Awret, 2022); holographic principle of mind and the evolution of consciousness (Germine, 2018); and quantum hologram theory of consciousness as a framework for altered states of consciousness research (Valverde et al., 2022). In fact, for a theory to have a shot at explaining consciousness, if it does not stimulate strange ideas, it probably doesn't have the disruptive firepower that is surely required.

For example, physicist Uziel Awret's dual-aspect information theory

of consciousness—holographic-duality—is motivated by certain anti-physicalist problem intuitions associated with representational content and spatial location and attempts to provide these with a topic neutral, consciousness-independent explanation—which, he says "is 'hard' enough to make a philosophical difference and yet 'easy' enough to be approached scientifically." This is achieved by, "among other things, showing that it is possible to conceive of physical scenarios that protect physicalism from the conceivability argument without needing to explain all the other anti-physicalist problem intuitions." Awret argues that "abstract algorithms are not enough to solve this problem and that a more radical 'computation' that is inspired by physics and that can be realized in 'strange metals' may be needed" (Awret, 2022).

9.4.6. Doyle's experience recorder and reproducer

"Information Philosopher" Bob Doyle proposes the "Experience Recorder and Reproducer (ERR)" as an information model for the mind. He says that the mind, like software, is immaterial information, a human being "is not a machine, the brain is not a computer, and the mind is not *processing* digital information." His proposal is that "a minimal primitive mind would need only to 'play back' past experiences that resemble any part of current experience, because "remembering past experiences has obvious relevance (survival value) for an organism." However, beyond its survival value, "the ERR evokes the epistemological 'meaning' of information perceived in that it may be found in the past experiences that are reproduced by the ERR, when stimulated by a new perception that resembles past experiences in some way" (Section: Doyle, n.d.b).

Without prior similar experience, new perceptions will be "meaningless." A conscious being is constantly recording information about its perceptions of the external world and most importantly for ERR, it is simultaneously recording its feelings. Experiential data such as sights, sounds, smells, tastes, and tactile sensations are recorded in a sequence in association with emotional states, such as pleasure and pain, fear and comfort levels, etc. This means that when the experiences are reproduced (played back in a temporal sequence), the accompanying emotions are once again felt, in synchronization. The capability of reproducing experiences is critical to *learning* from past experiences, so as to make them guides for action in future experiences.

The ERR biological model has information stored in "neurons that have been wired together." (Neuroscientist Donald Hebb said that "neurons that fire together wire together.") The stored information does not get recalled or retrieved (as computers do) to create a representation that can be viewed. Doyle prefers to call the reproduction a "re-presentation" in that the ERR is simply presenting or "re-presenting" the original experience in all parts of the conscious mind connected by the neural assembly. Humans are conscious of our experiences because they are recorded in (and reproduced on demand from) the information structures in our brains. Mental information houses the content of an individual (Doyle, n.d.b).

ERR, Doyle says, also solves the "binding problem," the unification of experience, because the sensory components are bound together when initially stored in the ERR (together with the accompanying emotion). They remain bound on playback. "They do not have to be assembled together by an algorithmic scheme."

Consciousness, Doyle says, can be defined in information terms as a property of an entity (usually a living thing but can also include computers and artificial intelligence) that reacts appropriately to the information (and particularly to changes in the information) in its environment. In the context of information philosophy, Doyle posits that the Experience Recorder and Reproducer can provide us with "*information consciousness*."

The treatment of information is said to link the physical and the phenomenal. Wherever there is a phenomenal state, it realizes an information state, which is also realized in the cognitive system of the brain. Conversely, for at least some physically realized information spaces, whenever an information state in that space is realized physically, it is also realized phenomenally. This leads Doyle to suppose that "this double life of information spaces corresponds to a duality at a deep level." He even suggests that this "double realization" of information is the key to the fundamental connection between physical processes and conscious experience. If so, Doyle concludes, we might develop a truly fundamental theory of consciousness. And it may just be that information itself is fundamental (Doyle, n.d.b).

9.4.7. Informational realism and emergent information theory

Philosopher/theologian/mathematician William Dembski argues that "informational realism," understood properly, can "dissolve the mind-body problem." Information realism "asserts that the ability to exchange information is the defining feature of reality, of what it means, at the most fundamental level, for any entity to be real." It does not deny, he says, the existence of things (i.e., entities or substances). Rather, it defines things as "their capacity for communicating or exchanging information with other things," such that "things make their reality felt by communicating or exchanging information." This means that information is "the relational glue that holds reality together" and "thus assumes primacy in informational realism" (Dembski, 2021, 2023).

A key move in dissolving the mind-body problem, according to Dembski, is to substitute information for perception under an informational realism framework, thereby giving the mind direct access to fundamental properties (9.8.10). Moreover, he says, informational realism is "able to preserve a common-sense realism that idealism has always struggled to preserve" because all things simply communicate information to their "immediate surroundings, which then ramifies through the whole of reality, reality being an informationally connected whole" (Dembski, 2021, 2023).

Engineering professor Jaime Cardenas-Garcia links consciousness with "infoautopoiesis" (i.e., the process of self-production of information) and seeks to "demystify" both. Infoautopoiesis, he says, "allows a human organism-in-its-environment to uncover the bountifulness of matter and/or energy as expressions of their environmental spatial/temporal motion/change, i.e., as information or Batesonian differences which make a difference." Thus, "individuated, internal, inaccessible, semantic information is the essence of consciousness," and neither self-produced information nor consciousness is "a fundamental quantity of the Universe" (Cardenas-Garcia, 2023).

Independent researcher Daniel Boyd presents Emergent Information Theory (EIT) to bridge the mind-body gap by considering biological and technological information systems as a possible mechanism of "non-material mind" (as defined in an informational context) influencing the physical body. EIT uses the term "information" as exemplified by computer binary "values." While associated with a physical state (e.g., a magnetic polarity) they are distinct from it. The system design allows the "value" to be deduced from the state. However, being not composed of matter or energy the value itself, as defined, cannot interact with or be detected by any device. Yet it is these values that underlie the computer's function. EIT proposes that brain function is based on comparable primitive information associated with neuronal states (Boyd, 2020).

These basic units of information are of no use individually. In computers they are combined to form hierarchical levels of organization—bytes, subroutines and programs—which cannot be observed, but can be deduced using the coding systems used to create them. Each level has properties that do not exist in underlying levels: the "emergence" referred to in EIT. Brain functions are based on equivalent hierarchical, emergent phenomena which are equally non-detectable. This applies not just to consciousness, but to all functional brain phenomena. That, in an organic system, this generic approach can result in the remarkable properties of consciousness should come as no surprise. Based on the top-down causation that is common in strongly emergent systems, EIT provides a mechanism for the influence of non-material mind over the physical body (Boyd, 2020).

9.4.8. Mathematical theories

Mathematics can apply to consciousness in two ways. The first approach involves methods, models and simulations that are increasingly rigorous and sophisticated, describing and explaining essential features and mechanisms of conscious experience, primarily its structure, level, content and dynamics (Labh, 2024). Here mathematics supports various headline theories. Integrated Information Theory (12) relies on a mathematical determination of consciousness. Friston's Free-Energy Principle formalizes and optimizes the representational capacities of physical/brain systems (9.5.4). Hoffman's Conscious Realism (Idealism) utilizes a mathematical formulation of consciousness (16.5).

The second approach posits deep claims that mathematical structures form the foundations of consciousness, much as mathematical structures form the foundations of quantum mechanics. In a sense, the first way, clear and common, is epistemological; the second, highly speculative, is ontological.

As for mathematics as ontology, Max Tegmark has the entire universe, all reality, as a fundamental mathematical structure (Tegmark, 2014a). Roger Penrose has the Platonic world of perfect forms as primary such that physical and mental worlds are its "shadows." We "perceive mathematical truths directly," Penrose says, in that "whenever the mind perceives a mathematical idea, it makes contact with Plato's world of mathematical concepts" (Penrose, 1996). Both visions, certainly controversial, would be consistent with mathematical constructions of consciousness, suggesting that consciousness is "made of" mathematics.

Initiatives to link the abstract formal entities of mathematics, on the one hand, and the concreta of conscious experience, on the other hand, have proliferated, the challenge being to "represent conscious experience in terms of mathematical spaces and structures." But what is "a mathematical structure of conscious experience?" (Kleiner and Ludwig, 2023).

Mathematicians Johannes Kleiner and Tim Ludwig seek a general method to identify and investigate structures of conscious experience—quality, qualia or phenomenal spaces—to perhaps serve as a framework to unify approaches from different fields. Their prime criterion is that for a mathematical structure to be literally of conscious experience, rather than merely a tool to describe conscious experience, "there must be something in conscious experience that corresponds to that structure." In simple terms, they say, such a mathematical structure consists of two building blocks: the first brings in one or more sets called the 'domains' of the structure, where the elements of sets correspond to aspects of conscious experiences. The second are relations or functions which are defined on the domains. The authors claim that this definition does not rely on any specific conception or aspects of conscious experience. Rather, it can work with any theory of consciousness in that "every conscious experience comes with a set of aspects," whether holistic, irreducible approaches to qualia and phenomenal properties, or theories built on atomistic conceptions of consciousness such as multiple mind modules (Kleiner and Ludwig, 2023).

Mathematician Yucong Duan proposes a mathematically based "bug" theory of consciousness in that, with respect to consciousness, a bug is "not only a limitation in information processing, but also an illusion that leads human beings to create abstract and complete semantics and use them as tools" (Duan and Gong, 2024a). He calls mathematics as "the language of consciousness," required to find patterns, periodicity, relevance and other characteristics in consciousness, to reveal causal relationships and interactions among them, and to understand the structure, dynamics and functions of consciousness." For example, "dynamic system theory can describe the evolution track and stable state of consciousness, and information theory can quantify the information flow and entropy value in consciousness, thus revealing the dynamic characteristics and information processing mechanism of consciousness." Moreover, Fourier transform can "decompose complex consciousness signals into simple frequency components and reveal the laws and mechanisms of consciousness activities through frequency domain analysis, filtering and time-frequency analysis"—combining to yield "new perspectives of consciousness regularities." Duan does recognize the limitations of mathematics (Duan and Gong, 2024b).

9.5. Homeostatic and affective theories

Homeostatic and Affective Theories stress predictive, homeostatic, free-energy (active inference), equilibrium, and emotion-related theories, and have become increasingly recognized as important theories of consciousness.

9.5.1. Predictive theories (Top-down)

Top-down predictive theories highlight brain-based, central-to-peripheral, efferent influence on sensory organs more than peripheral-to-central, afferent sensory perceptions—and while top-down predictive models may or may not be themselves explanations of consciousness, they give insight into the nature of consciousness and its evolutionary development. Top-down is a fundamental principle of how brains work and it would be surprising if it were not relevant for understanding consciousness.

According to Anil Seth and Tim Bayne, there are two general approaches to understanding consciousness via the centrality of top-down signaling in shaping and enabling conscious perception. The first is reentry theories where recurrent, reentrant pathways are in some sense conscious perceptions—and thus reentry theories are theories of consciousness per se. The second approach, broadly described as predictive processing, starts instead from a foundation principle of how the brain works—in terms of prediction as a core principle underlying perception, action, and cognition, and therefore does not directly specify theories of consciousness. Nonetheless, the "core claim of reentry theory and predictive processing (PP) is that conscious mental states are associated with top-down signaling (reentry, thick arrows) that, for PP, convey predictions about the causes of sensory signals (thin arrows signify bottom-up prediction errors), so that continuous minimization of prediction errors implements an approximation to Bayesian inference" (Seth and Bayne, 2022).

Cognitive philosopher Andy Clark puts it succinctly: Rather than your brain perceiving reality passively, your brain actively predicts it. Your brain is a powerful, dynamic prediction engine, mediating our experience of both body and world. From the most mundane experiences to the most sublime, reality as we know it is the complex synthesis of predictive expectation and sensory information, "sculpting" all human experience. Thus, the extraordinary explanatory power of the predictive brain (Clark, 2023).

Leveraging the work of Karl Friston (9.5.4), Clark states that in predictive processing, perception is structured around prediction, which he suggests is the fundamental operating principle of the brain (Musser, 2023a,b). While the rudimentary evolutionary driver of the predictive brain is simply survival, staying alive, the emergence of consciousness can be seen as facilitating the predictive capabilities in terms of awareness, responsiveness, and conformity to external realities.

Clark stresses that even though biological brains are increasingly cast as "prediction machines" this should not constrain us "to embrace a brain-bound 'neurocentric' vision of the mind." The mind, such views mistakenly suggest, consists entirely of the skull-bound activity of the predictive brain, an inference from predictive brains to skull-bound minds that Clark rejects. Predictive brains, he argues, can be apt participants in larger cognitive circuits. The path is thus cleared for a new synthesis in which predictive brains act as entry-points for extended minds (9.7.1), and embodiment and action contribute constitutively to knowing contact with the world (Clark, 2017a; 2017b.)

Cognitive psychologist Richard Gregory pioneered conceptualizing the brain as actively shaping perception, not the assumed inert receptacle of sensory signals. (Gregory himself credited Herman von Helmholtz for realizing that "perception is not just a passive acceptance of

stimuli, but an active process involving memory and other internal processes.") Gregory's key insight was that "the process whereby the brain puts together a coherent view of the outside world is analogous to the way in which the sciences build up their picture of the world, by a kind of hypothetico-deductive process." Although timescales differ, Gregory advocated the guiding principle that perception shares processes with the scientific method. In particular, Gregory incorporated "explicitly Bayesian concepts" into our understanding of how sensory data is combined with pre-existing beliefs ("priors") to modify and mold perceptions. Consciousness evolved, according to Gregory, to enable rapid comparisons between real-world events and counterfactual simulations in order to make optimum decisions (Gregory, 2023).

Neuroscientist Rudolfo Llinas traces the evolution of the "mindness state" to enable predictive interactions between mobile creatures and their environment, arguing that the nervous system evolved to allow active movement in animals. Because a creature must anticipate the outcome of each movement on the basis of incoming sensory data, the capacity to predict is most likely the ultimate brain function. Llinas even suggests that Self is the centralization of prediction (Llinas, 2002).

9.5.2. *Seth's "beast machine" theory*

Neuroscientist Anil Seth extends top-down predictive theories with his neuroscience-informed "beast machine" theory that conscious experiences can be understood as forms of brain-based perceptual prediction, within the general framework of predictive processing accounts of brain perception, cognition, and action. More specifically, his theory proposes that phenomenological properties of conscious experiences can be explained by computational aspects of different forms of perceptual prediction. A key instance of this is in the ability to account for differences between experiences of the world and experiences of the self. The theory also proposes that the predictive machinery underlying consciousness arose via a fundamental biological imperative to regulate bodily physiology, namely, to stay alive. We experience the world around us, and ourselves within it, with, through, and because of our living bodies (Seth, 2021a, 2021b).

Seth says that our conscious experiences of the world and the self are forms of brain-based prediction—which he labels "controlled hallucinations."[25] He asks, how does the brain transform what are inherently ambiguous, electrical sensory signals into a coherent perceptual world full of objects, people, and places? The key idea is that the brain is a "prediction machine," and that what we see, hear, and feel is nothing more than the brain's "best guess" of the causes of its sensory inputs. Because perceptual experience is determined by the content of the (top-down) predictions, and not by the (bottom-up) sensory signals, we never experience sensory signals themselves, we only ever experience interpretations of them. Thus, "what we actually perceive is a top-down, inside-out neuronal fantasy that is reined in by reality, not a transparent window onto whatever that reality may be." Taking this idea seriously and seeking its implications, Seth proposes that the contents of consciousness are a kind of waking dream—the "controlled hallucination"—that is both more than and less than whatever the real world really is. He offers slyly the insight that "you could even say that we're all hallucinating all the time. It's just that when we agree about our hallucinations, that's what we call reality" (Seth, 2021a, 2021b).

9.5.3. *Damasio's homeostatic feelings and emergence of consciousness*

Neuroscientist Antonio Damasio's perspective on consciousness is distinctive in a variety of ways. Crucially, the root process behind consciousness, he argues, is that of feelings related to the interior of complex organisms endowed with nervous systems. These feelings, which Damasio calls "homeostatic" to distinguish them from the feelings of emotions, continuously represents the ongoing state of the life of an organism in terms of how close or how far that state is from ideal, that ideal being *homeostasis* (Damasio and Damasio, 2023, 2024; Damasio, 1999).

Neuroanatomically, the homeostatic feeling representations are achieved by the interoceptive system which collects signals—via interoceptive axons in peripheral nerves and spinal and brainstem nuclei—from the entire spectrum of viscera, from smooth musculature to end organs. Interoception is distinct from exteroception in a number of ways, but quite importantly because it pertains to an internal, animated landscape. Feelings represent evolving, active states but the "describer"—the nervous system—happens to be located inside the organism being "described", with the consequence that the describer and described can interact. Moreover, the interaction is facilitated by the fact that the interoceptive nervous system is especially open, given its primitive nature, which includes neurons without myelin, whose axons are open to receiving signals at any point in their course, away from synapses (Damasio and Damasio, 2023, 2024).

Other reasons why homeostatic feelings are distinct, according to Damasio, include (1) the fact that they are *naturally*, *spontaneously*, *informative;* and (2) that the information they provide is used to adjust the life process such that it may best correspond to ideal conditions. In brief, homeostatic feelings are regulatory because their spontaneous consciousness is used to achieve homeostasis and guarantee the continuation of life.

Homeostatic feelings are the natural source of *experiences.* When they are combined with images generated by exteroceptive channels such as vision, they produce *subjectivity*.

Thus, according to Damasio, homeostatic feelings are the core phenomena of consciousness. They are *spontaneously* conscious processes of hybrid nature, combining mental features and bodily features. Their presence informs the rest of the mind, e.g., the images that correspond to current perceptions or to perceptions retrieved from memory, that (1) life is ongoing inside a specific body/organism, and that (2) the life process is (or is not) operating within a range conducive to the continuation of life. Feelings offer spontaneous guidance on this specific issue and are thus a key to life regulation and survival (Damasio and Damasio, 2023, 2024).

Damasio recounts that "the approach to the nature and physiology of consciousness has taken two distinct paths. One of those paths, by far the most frequent, has tied consciousness to cognitive processes, mainly exteroception, and most prominently, to vision. The other path has related consciousness to affective processes, specifically to feeling. 'The cognitive path' has seen consciousness as a complex and late arrival in biological history. It culminates in cognition writ large, e.g. exteroceptive processes, memory, reasoning, symbolic languages, and creativity. The 'affect path' has located the emergence of consciousness far earlier in biological history, and interoceptive processes provide the key" (Damasio and Damasio, 2021b, 2023, 2024; Damasio, 2019).

In making his argument, Damasio explains "how and why consciousness entered biology through the avenue of affect. The feelings that translate fundamental homeostatic states—hunger, thirst, malaise, pain, well-being, desire—offer organisms a new layer of life regulation because of their inherent conscious status. Consciousness spontaneously delivers valuable knowledge into the decision-making mental space. Consciousness allows organisms to act deliberately and knowingly, rather than acting or failing to act, automatically and blindly. Consciousness is what makes deliberate life regulation possible. The intrinsic conscious nature of feelings is their grace and was their passport into natural selection. Their conscious nature is not a neutral trait." Damasio assumes that "the emergence of consciousness occurred when homeostatic feelings first arose, there and then, and naturally provided knowledge concerning life" (Damasio, 2019, 2021a; Damasio, 2019).

9.5.4. *Friston's free-energy principle and active inference*

Theoretical neuroscientist Karl Friston conceptualizes consciousness

[25] Seth first heard the phrase "controlled hallucination" from British psychologist Chris Frith and traced it back to a seminar given in the 1990s by Ramesh Jain (Seth, 2021a).

as the natural outcome of his "free-energy principle for action and perception (active inference)," which stresses the primacy of minimizing in all organisms the difference between perceptual expectations (required for homeostasis) and real-time sensory inputs (Friston et al, 2017). In this mechanism, human brains seek to minimize the difference—reduce the "surprise," as it were—by generating internal models that predict the external world.

As a physicist and psychiatrist, Friston says: "I find it difficult to engage with conversations about consciousness. My biggest gripe is that the philosophers and cognitive scientists who tend to pose the questions often assume that the mind is a thing, whose existence can be identified by the attributes it has or the purposes it fulfills." The deeper question, he asks, is "what sorts of processes give rise to the notion (or illusion) that something exists?" Thus, Friston treats consciousness "as a process to be understood, not as a thing to be defined." Simply put, his argument is that "consciousness is nothing more and nothing less than a natural process such as evolution or the weather" (Friston, 2017).

Friston's perspective on process leads him to "an elegant, if rather deflationary, story about why the mind exists." It focuses on "inference," which Friston characterizes as "actually quite close to a theory of everything—including evolution, consciousness, and life itself." We are processes and processes can only reason towards what is "out there" based on "sparse samples of the world; " hence, the criticality of inference. This view, Friston says, "dissolves familiar dialectics between mind and matter, self and world, and representationalism (we depict reality as it is) and emergentism (reality comes into being through our abductive encounters with the world)" (Friston, 2017).

But how did inert matter ever begin the processes that led to consciousness? It starts with complex systems that are self-organizing because they possess "attractors," which are "cycles of mutually reinforcing states that allow processes to achieve a point of stability, not by losing energy until they stop, but through what's known as dynamic equilibrium. An intuitive example is homeostasis …." (Friston, 2017).

It's at this point that Friston focuses on inference, "the process of figuring out the best principle or hypothesis that explains the observed states of that system we call 'the world.'" Every time you have a new experience, he says, "you engage in some kind of inference to try to fit what's happening into a familiar pattern, or to revise your internal states so as to take account of this new fact."

That's why attractors are so crucial, he stresses, "because an attracting state has a low surprise and high evidence." A failure to minimize surprise means "the system will decay into surprising, unfamiliar states" – which would threaten its existence. "Attractors are the product of processes engaging in inference to summon themselves into being," he says. "In other words, attractors are the foundation of what it means to be alive" (Friston, 2017).

Friston applies the same thinking to consciousness and suggests that consciousness must also be a process of inference. "Conscious processing is about inferring the causes of sensory states, and thereby navigating the world to elude surprises … This sort of internalization of the causal structure of the world 'out there' reflects the fact that to predict one's own states you must have an internal model of how such sensations are generated" (Friston, 2017).

Learning as well as inference, Friston continues, relies on minimizing the brain's free energy. "Cortical responses can be seen as the brain's attempt to minimize the free energy induced by a stimulus and thereby encode the most likely cause of that stimulus. Similarly, learning emerges from changes in synaptic efficacy that minimize the free energy, averaged over all stimuli encountered" (Friston, 2005).

In short, consciousness is the evolved mechanism for simulating scenarios of the world. It is the internal emergent model that monitors and minimizes the free energy principle, the difference between internal perceptual expectations and real-time sensory input that reflects the external world. Friston proposes that "the mind comes into being when self-evidencing has a temporal thickness or counterfactual depth, which grounds the inferences it can make about the consequences of future actions." Consciousness, he contends, "is nothing grander than inference about my future" (Friston, 2017).

Friston's consciousness as active inference leads to its metaphysical stamp as "Markovian monism," which, he says, rests upon the information geometry induced in any system whose internal states can be distinguished from external states—such that "the (intrinsic) information geometry of the probabilistic evolution of internal states and a separate (extrinsic) information geometry of probabilistic beliefs about external states that are parameterized by internal states." Friston calls these information geometries intrinsic (i.e., mechanical, or state-based) and extrinsic (i.e., Markovian, or belief-based). He suggests the mathematics may help frame the origins of consciousness (Friston et al., 2020).

Several theories of consciousness build on the free-energy paradigm, including Solms's Affect (9.5.5), Carhart-Harris's Entropic Brain (9.5.6) and Projective Consciousness Model (9.5.11).

9.5.5. Solms's affect as the hidden spring of consciousness

Neuroscientist and psychoanalyst Mark Solms applies Friston's free energy principle to the hard problem of consciousness. He identifies the elemental form of consciousness as affect and locates its physiological mechanism (an extended form of homeostasis) in the upper brainstem. Free energy minimization (in unpredicted contexts) is operationalized "where decreases and increases in expected uncertainty are felt as pleasure and unpleasure, respectively." He offers reasons "why such existential imperatives feel like something to and for an organism" (Solms, 2019).

A physicalist, Solms argues that the brain does not "produce" or "cause" consciousness. "Formulating the relationship between the brain and the mind in causal terms," he says, "makes the hard problem harder than it needs to be. The brain does not produce consciousness in the sense that the liver produces bile, and physiological processes do not cause—or become or turn into—mental experiences through some curious metaphysical transformation" (Solms, 2019).

Objectivity and subjectivity are observational perspectives, he says, not causes and effects. "Neurophysiological events can no more produce psychological events than lightning can produce thunder. They are dual manifestations of a single underlying process. The cause of both lightning and thunder is electrical discharge, the lawful action of which explains them both. Physiological and psychological phenomena must likewise be reduced to unitary causes, not to one another. This is merely a restatement of a well-known position on the mind–body problem: that of dual-aspect monism"[26] (Solms, 2021b). (6.)

Given the centrality of affect in Solms' theory of consciousness, he must argue that emotion is the most efficient mechanism, perhaps the only effective mechanism, to optimize survival. His reasoning applies the free energy principle (9.5.4) in neurobiology such that feelings would uniquely enable humans to monitor interactions with unpredictable environments and modify their behaviors accordingly.

Solms explains that "complex organisms have multiple needs, each of which must be met in its own right, and, indeed, on a context-dependent basis, they cannot be reduced to a common denominator. For example … fear trumps sleepiness in some contexts but not in others." So, he says, the needs of complex organisms like ourselves must be coded as categorical variables, which are distinguished qualitatively, not quantitatively. Thirst feels different from sleepiness feels different from separation distress feels different from fear, etc., such that their combined optimized resolution must be computed in a context-dependent fashion, which would lead to "excessively complex calculations," a

[26] Although Solms refers to "dual-aspect monism," his ideas relate more to the elemental properties of bodies, namely an insulating membrane (the ectoderm of complex organisms, from which the neural plate derives) and adaptive behavior, rather than a theory of fundamental ontology. Hence, the inclusion here under Materialism Theories, Homeostatic and Affective, not under Monisms.

"combinatorial explosion." In terms of time spent and energy expended, the invention of affect, emotion, feeling is a much more efficient algorithm. Moreover, Solms adds, since "the needs of complex organisms which can act differentially, in flexible ways, in variable contexts, are 'color-coded' or 'flavored,' this provides at least one mechanistic imperative for qualia" (Solms, 2021a, 2021b).

Solms seeks to demystify consciousness by showing that "cortical functioning is accompanied by consciousness if and only if it is 'enabled' by the reticular activating system of the upper brainstem. Damage to just two cubic millimeters of this primitive tissue reliably obliterates consciousness as a whole." He rejects arguments that the reticular activating system generates only the quantitative "level" of consciousness (consciousness in a waking/comatose sense) and not its qualitative "contents" (consciousness as experience). This is affect, Solms says, and it is supported by "overwhelming" evidence. Therefore, since cortical consciousness is contingent upon brainstem consciousness, and since brainstem consciousness is affective, Solms concludes that "*affect is the foundational form of consciousness*. Sentient subjectivity (in its elementary form) is literally constituted by affect" (Solms, 2021a).[27]

Solms distinguishes between information processing models in cognitive science, which seem to lack question-askers, and self-organizing systems, which are obliged to ask questions—"their very survival depends upon it. They must chronically ask: 'What will happen to my free energy if I do that?' The answers they receive determine their confidence in the current prediction." This is why Solms states "not all information processing ('integrated' or otherwise) is conscious; sentience appears to be a property of only some information processing systems with very specific properties, namely those systems that must ask questions of their surrounding world in relation to their existential needs" (Solms, 2021a)

In summary, Solms claims that the functional mechanism of consciousness can be reduced to physical laws, such as Friston's free-energy law, among others. These laws, he says, "are no less capable of explaining how and why proactively resisting entropy (i.e., avoiding oblivion) feels like something to the organism, for the organism, than other scientific laws are capable of explaining other natural things. Consciousness is part of nature, and is mathematically tractable."

As a corollary, with respect to Crick's research program on the neural correlates of consciousness, Solms declares that there can be no objects of consciousness (e.g. visual ones) in the absence of a subject of consciousness. To Solms, the subject of consciousness is literally constituted by affect (Solms, 2021a).

Regarding AI consciousness, Solms posits that if his theory is correct, "then, in principle, an artificially conscious self-organizing system can be engineered." The creation of an artificial consciousness would be, he says, "the ultimate test of any claim to have solved the hard problem." But, he warns, "we must proceed with extreme caution."

9.5.6. *Carhart-Harris's entropic brain hypothesis*

Psychopharmacologist Robin Carhart-Harris proposes the Entropic Brain Hypothesis in which the entropy of spontaneous brain activity indexes the informational richness of conscious states (within upper and lower limits, after which consciousness may be lost). A leading psychedelic researcher, Carhart-Harris reports that the entropy of brain activity is elevated in the psychedelic state, and there is evidence for greater brain "criticality" under psychedelics. ("Criticality … is the property of being poised at a 'critical' point in a transition zone between order and disorder where certain phenomena such as power-law scaling appear.") He argues that "heightened brain criticality enables the brain to be more sensitive to intrinsic and extrinsic perturbations which may translate as a heightened susceptibility to 'set' and 'setting.'" Measures of brain entropy, he suggests, can inform the treatment of psychiatric and neurological conditions such as depression and disorders of consciousness (Carhart-Harris, 2018).

The "entropy" in the Entropic Brain Hypothesis is defined as "a dimensionless quantity that is used for measuring uncertainty about the state of a system but it can also imply physical qualities, where high entropy is synonymous with high disorder." Entropy is then applied in "the context of states of consciousness and their associated neurodynamics, with a particular focus on the psychedelic state … [which] is considered an exemplar of a primitive or primary state of consciousness that preceded the development of modern, adult, human, normal waking consciousness." Based on neuroimaging data with psilocybin, a classic psychedelic drug, Carhart-Harris argues that "the defining feature of 'primary states' is elevated entropy in certain aspects of brain function, such as the repertoire of functional connectivity motifs that form and fragment across time. Indeed, since there is a greater repertoire of connectivity motifs in the psychedelic state than in normal waking consciousness, this implies that primary states may exhibit 'criticality'" (Carhart-Harris, 2018).

Significantly, "if primary states are critical, then this suggests that entropy is suppressed in normal waking consciousness, meaning that the brain operates just below criticality." This leads to the idea that "entropy suppression furnishes normal waking consciousness with a constrained quality and associated metacognitive functions, including reality-testing and self-awareness." Carhart-Harris and colleagues also propose that "entry into primary states depends on a collapse of the normally highly organized activity within the default-mode network" (DMN—a set of regions more active during passive tasks than tasks requiring focused external attention, Buckner, 2013),[28] thus maintaining the brain's homeostasis and "a decoupling between the DMN and the medial temporal lobes (which are normally significantly coupled)" (Carhart-Harris et al., 2014).

Increased entropy in spontaneous neural activity is one of the most notable neurophysiological signatures of psychedelics and is said to be relevant to the psychedelic experience, mediating both acute alterations in consciousness and long-term effects. While overall entropy increases, entropy changes are not uniform across the brain: entropy increases in all regions, but the larger effect is localized in visuooccipital regions. At the whole-brain level, this reconfiguration is related closely to the topological properties of the brain's anatomical connectivity (Herzog et al 2023). (For how psychedelic experiences and mechanisms may or may not inform theories of consciousness, see 18.21.)

Computational neuroscientist Gustavo Deco uses the concept of equilibrium in physics to explore consciousness. Since a physical system is in equilibrium when in its most stable state, the question is how close to equilibrium are the electrical states of the brain while people perform different tasks? Using a sophisticated mathematical theorem to analyze neuroimaging data, "they found that the brain is closer to a state of equilibrium when people are gambling than when they are cooperating," suggesting that "there are many shades of consciousness" (Callaghan, 2024).

9.5.7. *Buzsáki's neural syntax and self-caused rhythms*

Neuroscientist György Buzsáki presents the brain as "a foretelling device that interacts with its environment through action and the examination of action's consequence," restructuring its internal rhythms in the process. In his telling, "our brains are initially filled with nonsense patterns, all of which are gibberish until grounded by action-based interactions. By matching these nonsense 'words' to the outcomes of action, they acquire meaning." Once brain circuits are "calibrated" or trained by action and experience, "the brain can disengage from its sensors and actuators, and examine 'what happens if' scenarios by peeking into its own computation, a process that we refer to as cognition." Buzsáki stresses that "our brain is not an information-absorbing

[27] Referencing Zeman, A. (2001.) Consciousness, *Brain*, 124 (Solms, 2021a).

[28] It is also active during directed tasks that require participants to remember past events or imagine upcoming events (Buckner, 2013).

coding device, as it is often portrayed, but a venture-seeking explorer constantly controlling the body to test hypotheses." Our brain does not process information. He says, our brain "creates it" (Buzsáki, 2019).

Buzsáki focuses on "neural syntax", which segments neural information and organizes it via diverse brain rhythms to generate and support cognitive functions. One expression is the "hierarchical organization of brain rhythms of different frequencies and their cross-frequency coupling." Buzsáki shows that "in the absence of changing environmental signals, cortical circuits continuously generate self-organized cell assembly sequences"—clusters of neurons acting as focused functional units—that are the neuronal assembly basis of cognitive functions. He also shows "how skewed distribution of firing rates supports robustness, sensitivity, plasticity, and stability in neuronal networks" (Buzsáki, *Wikipedia*).

Buzsáki's foundational idea is that "spontaneous neuron activity, far from being mere noise, is actually the source of our cognitive abilities," and that "self-emerged oscillatory timing is the brain's fundamental organizer of neuronal information." The perpetual interactions among these multiple network oscillators, he says, "keep cortical systems in a highly sensitive 'metastable' state and provide energy-efficient synchronizing mechanisms via weak links" (Buzsáki, 2011).

Taken together, Buzsáki coins his "inside-out" view. "The brain," he says, "is a self-organized system with preexisting connectivity and dynamics whose main job is to generate actions and to examine and predict the consequences of those actions". Brains draw from and interact with the world, rather than detect it. "In other words, rather than the world filling in the brain with information, the brain fills out the world with action." Flipping the brain–world relationship, Buzsáki posits that brain activity is fundamentally self-caused (Gomez-Marin, 2021).

Brain rhythms are Buzsáki's key mechanisms. "Spanning several orders of magnitude, and organized in nested frequency bands, these fascinating neuronal oscillations support neuronal syntax." As Buzsáki puts it, "activity travels in neuronal space, much like waves in a pond." Cognition is merely internalized action, and it arises when the brain disengages from the world. He thus recasts "the cognitive into the neural by means of action as a kind of ultimate cognitive source. It is action all the way in, all the way out, and all the way down" (Gomez-Marin, 2021).

Still, Buzsáki must explain how endogenously produced neural syntax acquires its meaning, and to do so, he reaches outside the brain. Semantics are selected by the world, he stresses, and here's how it works. External inputs, sequences of perceptions that constitute wholes or fragments of meaning, engage and modify self-organized neural patterns so that they become meaningful and useful (broadly). Similarly, Buzsáki has learning as a matching process. "Existing, spontaneous neural patterns are selected rather than constructed anew. The brain is not a blank slate but one filled with syntactically correct gibberish that progressively acquires meaning via the pruning of the arbitrariness that the world affords" (Gomez-Marin, 2021).

Related, Buzsáki and Tingley explain cognition, including memory, "by exaptation and expansion of the circuits and algorithms serving bodily functions." They explain how "Regulation and protection of metabolic and energetic processes require time-evolving brain computations enabling the organism to prepare for altered future states." The exaptation of such circuits, according to the authors, was likely exploited for exploration of the organism's niche, giving rise to "a cognitive map," which in turn "allows for mental travel into the past (memory) and the future (planning)" (Buzsáki and Tingley, 2023). Moreover, Buzsáki's "two-stage model of memory trace consolidation, demonstrates how neocortex-mediated information during learning transiently modifies hippocampal networks, followed by reactivation and consolidation of these memory traces during sharp wave-ripple patterns of sleep" (Buzsáki, 2024).

While explaining that cognition is not the same thing as explaining phenomenal consciousness, Buzsáki's theory of cognition can develop into its own theory of consciousness. Moreover, it can help select among other theories of consciousness, as it aligns more consistently with some Neurobiological Theories (9.2), such as Brain Circuits and Cycles (9.2.11); possibly Electromagnetic Field Theories (9.3); and certainly Homeostatic and Affective Theories (9.5), especially Top-Down Predictive Theories (9.5.1).

9.5.8. *Deacon's self-organized constraint and emergence of self*

Neuroanthropologist Terrence Deacon, whose research combines human evolutionary biology and neuroscience, asserts that the origins of life and the origins of consciousness both depend on the emergence of self: the organizational core of both is a form of self-creating, self-sustaining, constraint-generating processes (Deacon, 2011a, 2011b).

Deacon characterizes consciousness as "a matter of constraint," focusing as much on what isn't there as on what is. He goes beyond complexity theory, non-linear dynamics and information theory to what he calls "emergent dynamics" theory where constraints can become their own causes, how constraints become capable of maintaining and producing themselves. This, he says, is essentially what life accomplishes. But to do this, life must persistently recreate its capacity for self-creation. What Deacon means by self "is an intrinsic tendency to maintain a distinctive integrity against the ravages of increasing entropy as well as disturbances imposed by the surroundings" (Deacon, 2011a, 2011b).

The nexus to consciousness is the emergence of self: "this kind of reciprocal, self-organizing logic (but embodied in neural signal dynamics) must form the core of the conscious self." Conceiving of neuronal processes in emergent dynamical terms, Deacon reframes aspects of mental life; for example, the experience of emotion relates to the role metabolism plays in regulating the brain's self-organizing dynamics, which are triggered whenever a system is perturbed away from its equilibrium, a process that shifts availability of energy in the brain. Thus, Deacon suggests that "conscious arousal is not located in any one place, but constantly shifts from region to region with changes in demand" (Deacon, 2011a, 2011b).

9.5.9. *Pereira's sentience*

Neuroscientist Antonio Pereira, Jr. hypothesizes that cognitive consciousness depends on sentience. He distinguishes "two modalities of consciousness: sentience, in the sense of being awake and capable of feeling (e.g., basic sensations of hunger, thirst, pain) and, second, cognitive consciousness, i.e. thinking and elaborating on linguistic and imagery representations." He proposes that the physiological correlates of sentience are "the systems underpinning the dynamic control of biochemical homeostasis," while the correlates of cognitive consciousness are "patterns of bioelectrical activity in neural networks. His primary point is that "cognitive consciousness depends on sentience, but not vice versa" (Pereira, 2021).

Pereira applies his concept of sentience as a theory of consciousness to the medical sciences, especially neurology and psychiatry, for both diagnostics and therapy. This implies that "medical practice should also address the physiological correlates of sentience in the diagnostics and therapy of disorders of consciousness." The minimal requirement, he says, "for considering a person minimally conscious is … if she can feel basic sensations such as hunger, thirst, and pain. The capacity for feeling is conceived as closely related to the capacity of dynamically controlling the physiological processes of homeostasis."

In applying theories of consciousness to medical care, Pereira posits that higher-level capacities "such as verbal or imagery thinking, the retrieval of episodic memories, and action planning (e.g. imagining playing tennis, a technique for assessing residual consciousness in vegetative states), may not be adequate as *a general standard* for medical diagnosis of prolonged disorders of consciousness, since … in many cases the person may not be able to perform these tasks but still be able to consciously experience basic sensations" (Pereira, 2021).

Taking general anesthesia as an example, Pereira states that "if the main criterion is not being able to feel pain, the goal of the procedure would be broader than the loss of cognitive consciousness. In some

cases, the neural correlates of cognitive representations may not be the main target of treatment, since they correspond to a high-level specific ability that is not necessary for lower-level sentient experiences, which also deserve attention for proper medical and also bioethical reasons" (Pereira, 2021).

9.5.10. Mansell's perceptual control theory

Clinical psychologist Warren Mansell proposes Perceptual Control Theory (PCT) in which "reorganization is the process required for the adaptive modification of control systems in order to reduce the error in intrinsic systems that control essential, largely physiological, variables." It is from this system, he says, that primary [phenomenal] consciousness emerges and "is sustained as secondary [access] consciousness through a number of processes including the control of the integration rate of novel information via exploratory behavior, attention, imagination, and by altering the mutation rate of reorganization." Tertiary [self-awareness] consciousness arises when "internally sustained perceptual information is associated with specific symbols that form a parallel, propositional system for the use of language, logic, and other symbolic systems" (Mansell, 2022).

Mansell's objective is to give an "integrative account of consciousness," which "should build upon a framework of nonconscious behavior in order to explain how and why consciousness contributes to, and addresses the limitations of, nonconscious processes." Such a theory, as noted, "should also encompass the primary (phenomenal), secondary (access), and tertiary (self-awareness) aspects of consciousness," and "address how organisms deal with multiple, unpredictable disturbances to maintain control." Such categories of consciousness come about, according to PCT, because of "purposiveness," which is "the control of hierarchically organized perceptual variables via changes in output that counteract disturbances which would otherwise increase error between the current value and the reference value (goal state) of each perceptual variable" (Mansell, 2022).

9.5.11. Projective consciousness model

The Projective Consciousness Model (PCM) is a mathematical model of embodied consciousness that "relates phenomenology to function, showing the computational advantages of consciousness." It is based on "the hypothesis that the spatial field of consciousness (FoC) is structured by a projective geometry and under the control of a process of active inference." The FoC in the PCM is said to combine "multisensory evidence with prior beliefs in memory" and to frame them "by selecting points of view and perspectives according to preferences." This "choice of projective frames governs how expectations are transformed by consciousness. Violations of expectation are encoded as free energy. Free energy minimization drives perspective taking, and controls the switch between perception, imagination and action" (Rudrauf et al, 2017).

Founding assumptions of the PCM include: consciousness as an evolved mechanism that optimizes information integration and functions as an algorithm for the maximization of resilience; relating the free energy principle (9.5.4) to perceptual inference, active inference and (embodied) conscious experience; an integrative predictive system projecting a global 3-dimensional spatial geometry to multimodal sensory information and memory traces as they access the conscious workspace; and emphasis on the embodied nature of consciousness (9.6.1), without reducing consciousness to embodiment. A pivotal idea is that embodied systems have "an evolutionary advantage of developing an integrative cognition of space in order to represent, simulate, appraise and control spatially distributed information and the consequences of actions" (Rudrauf et al, 2017).

Much is made of "the lived body," because "in contrast to most contents of consciousness, the lived body is normally always present in the conscious field … a proxy for the integrity of the actual body … an anchor point for our efforts at preserving autonomy and well-being." The lived body, therefore, is "a kind of inferential representation of the real body in physical space … a sort of virtual 'user interface' for the representation and control of the actual body."

Thus, the PCM claims to account for fundamental psychological phenomena: the spatial phenomenology of subjective experience; the distinctions and integral relationships between perception, imagination and action; and the role of affective processes in intentionality. The PCM suggests that brain states becoming conscious "reflect the action of projective transformations" (Rudrauf et al, 2017).

9.5.12. Pepperell's organization of energy

Artist and perceptual scientist Robert Pepperell suggests that while energetic activity is fundamental to all physical processes and drives biological behavior, consciousness is a specific product of the organization of energetic activity in the brain. He describes this energy, along with forces and work, as "actualized differences of motion and tension," and believes that consciousness occurs "because there is something it is like, intrinsically"—from the intrinsic perspective of the system—"to undergo a certain organization of actualized differences in the brain" (Pepperell, 2018).

Pepperell laments that "energy receives relatively little attention in neuroscientific and psychological studies of consciousness. Leading scientific theories of consciousness do not reference it, assign it only a marginal role, or treat it as an information-theoretical quantity. If it is discussed, it is either as a substrate underpinning higher level emergent dynamics or as powering neural information processing." He argues that "the governing principle of the brain at the neural level is not information processing but energy processing," although the information-theoretic approach can complement the energetic approach. Pepperell puts "information in the biological context as best understood as a measure of the way energetic activity is organized, that is, its complexity or degree of differentiation and integration." While "information theoretic techniques provide powerful tools for measuring, modeling, and mapping the organization of energetic processes," he says, "we should not confuse the map with the territory" (Pepperell, 2018).

In comparison with mainstream brain organization frameworks at the global level or localized, Pepperell offers, as an alternative or complementary way of thinking, how the energetic activity in the brain is organized. The challenge for the model is why energetic processing is associated with consciousness in the brain but not in other organs, like the liver or heart. Pepperell claims that energetic activity in the brain efficiently actuates *differences* of motion and tension that make the difference, perhaps via dynamic recursive organization – the "appropriate reentrant intracortical activity."

"If we are to naturalize consciousness," Pepperell concludes, "then we must reconcile energy and the mind." Treating the brain as a difference engine that serves "the interests of the organism is a natural approach to understanding consciousness as a physical process" (Pepperell, 2018).

9.6. Embodied and enactive theories

Embodied and Enactive Theories emphasize the importance of the body and its interaction with the environment as an integral part of what consciousness is, not only what consciousness does. It also includes neurophenomenology, unifying two disparate ways of studying consciousness.

9.6.1. Embodied cognition

Embodied Cognition is the concept that what makes thought meaningful are the ways neural circuits are connected to the body and characterize embodied experience, and that abstract ideas and language are embodied in this way as well. While cognition and consciousness are not the same, cognitive linguist George Lakoff argues that the mind is embodied, in that even pure mentality depends on the body's sensorimotor systems and emotions and cannot be comprehended without engaging them (Lakoff, 2007, 2012).

In their classic book on the embodied mind, *Philosophy in the Flesh*, Lakoff and Mark Johnson stress three points: "The mind is inherently embodied. Thought is mostly unconscious. Abstract concepts are largely metaphorical. Much of the subject matter of philosophy, they claim, such as the nature of time, morality, causation, the mind, and the self, relies heavily on basic metaphors derived from bodily experience. Thought requires a body, they assert, "not in the trivial sense that you need a physical brain with which to think, but in the profound sense that the very structure of our thoughts comes from the nature of the body" (Lakoff and Johnson, 1999).

9.6.2. Enactivism

Enactivism is the way of thinking that posits to explore mental activities, one must examine living systems interacting with their environments. Cognition is characterized as embodied activities. A mind without a body would be as if incoherent.

"Enaction" was the term introduced in *The Embodied Mind*, the 1991 book by Varela, Rosch and Thompson (Varela et al., 1991). The enactive view is that cognition develops via dynamic, bidirectional exchanges between an organism and its surroundings. It is not the case that an organism seeks optimum homeostasis in a static environment, but rather that the organism is shaping its environment, and is being shaped by its environment—actively, iteratively, continuously—all mediated by that organism's sensorimotor processes. Thus, organisms are active agents in the world who affect the world and who are affected by the world. (Section: Hutto, 2023; Enactivism, 2024).

Enactivists would harbor no hope of understanding mentality unless it were founded on histories of such bidirectional organism-environment interactions because that's the core concept of how minds arise and work. Organisms are self-creating, self-organizing, self-adapting, self-sustaining living creatures who regulate themselves and in doing so can change their environments, which then, iteratively, recycles the whole process.

The scientific consensus is that phenomenal consciousness evolved via stages of cognition and proto-consciousness selected by fitness-enhanced traits in challenging environments. Although focused on cognition, enactivism enriches the consciousness-generating conditions by adding interactive dynamism between the organism and the environment. (Enactment is also said to be "a genuinely metaphysical idea" and "an ontological breakthrough" in that "Something *is the case* if and only if it is enacted" [Werner, 2023].)

9.6.3. Varela's neurophenomenology

Neuroscientist and philosopher Francisco Varela proposes what he calls "neurophenomenology," which seeks to articulate mutual constraints between phenomena present in experience, inspired by the style of inquiry of phenomenology, and the correlative field of phenomena established by the cognitive sciences (Varela Legacy, 2023). He starts with one of Chalmers's basic points: first-hand experience is an irreducible field of phenomena. He claims there is no "theoretical fix" or "extra ingredient" in nature that can possibly bridge this gap. Instead, the field of conscious phenomena require a rigorous method and an explicit pragmatics. It is a quest, he says, to marry modern cognitive science and a disciplined approach to human experience, thereby placing himself in the lineage of the continental tradition of phenomenology (Varela, 1996).

Varela calls for gathering a research community armed with new tools to develop a science of consciousness. He claims that no piecemeal empirical correlates, nor purely theoretical principles, will do the job. He advocates turning to a systematic exploration of the only link between mind and consciousness that seems both obvious and natural: the structure of human experience itself.

Varela's phenomenological approach starts with the irreducible nature of conscious experience. Lived experience, he says, is "where we start from and where all must link back to, like a guiding thread." From a phenomenological standpoint, "conscious experience is quite at variance with that of mental content as it figures in the Anglo-American philosophy of mind." He advocates examining, "beyond the spook of subjectivity, the concrete possibilities of a disciplined examination of experience that is at the very core of the phenomenological inspiration." He repeats: "it is the re-discovery of the primacy of human experience and its direct, lived quality that is phenomenology's foundational project" (Varela, 1996).

Varela's key point is that by emphasizing a co-determination of both accounts—phenomenological and neurobiological—one can explore the bridges, challenges, insights and contradictions between them. This means that both domains have equal status in demanding full attention and respect for their specificity. It is quite easy, he says, to see how scientific accounts illuminate mental experience, but the reciprocal direction, from experience towards science, is what is typically ignored.

What do phenomenological accounts provide? Varela asks. "At least two main aspects of the larger picture. First, without them the firsthand quality of experience vanishes, or it becomes a mysterious riddle. Second, structural accounts provide constraints on empirical observations." He stresses that "the study of experience is not a convenient stop on our way to a real explanation, but an active participant in its own right." And while phenomenal experience is at an irreducible ontological level, "it retains its quality of immediacy because it plays a role in structural coherence via its intuitive contents, and thus keeps alive its direct connection to human experience, rather than pushing it into abstraction" (Varela, 1996).

This makes the whole difference, Varela argues: The "hardness" and riddle become an open-ended research program with the structure of human experience playing a central role in the scientific endeavor. "In all functionalistic accounts what is missing is not the coherent nature of the explanation but its alienation from human life. Only by putting human life back in, will that absence be erased" (Varela, 1996). (The common thread said to run through Varela's extensive and heterogenous body of work is "the act of distinction"—distinctions as processes, distinctions in ways of distinguishing—"the aim of which was to address and supersede the challenges inherent in the dualist [modernist] thought style, especially the infamous two-pronged problem of the bifurcation and disenchantment of nature" [Vörös, 2023].)

In the quarter century since Varela's neurophenomenology paper was published, its research program has made some advances and encountered some tensions; for example, investigating the experience of boundaries of the self, both phenomenologically and neurobiologically. The biggest challenge remains first-person reporting and interpretation, such as subtle aspects of self-consciousness. The continuing hope is that neurophenomenology can inform the science of consciousness, that the ongoing interaction between human experience and neuroscience becomes "an act of art, a deep listening, an improvisational dance, which slowly develops into a skillful scientific dialogue" (Berkovich-Ohana et al., 2020).

9.6.4. Thompson's mind in life

Philosopher Evan Thompson heralds "the deep continuity of life and mind." His foundational idea is "Where there is life there is mind, and mind in its most articulated forms belongs to life," and his organizing principle is "Life and mind share a core set of formal or organizational properties, and the formal or organizational properties distinctive of mind are an enriched version of those fundamental to life." More precisely, he says, "the self-organizing features of mind are an enriched version of the self-organizing features of life. The self-producing or 'autopoietic' organization of biological life already implies cognition, and this incipient mind finds sentient expression in the self-organizing

dynamics of action, perception, and emotion, as well as in the self-moving flow of time-consciousness" (Thompson, 2002; Maturana and Varela, 1980).[29]

From this perspective, Thompson sees mental life as bodily life and as situated in the world. The roots of mental life lie not simply in the brain, he says, "but ramify through the body and environment. Our mental lives involve our body and the world beyond the surface membrane of our organism, and therefore cannot be reduced simply to brain processes inside the head."

With this framework, Thompson seeks to reduce (if not bridge) the so-called "explanatory gap" between consciousness and world, mind and brain, first-person subjectivity and third-person objectivity (i.e., the hard problem of consciousness). He works to achieve this (to over-simplify) by having the same kinds of processes that enable the transition from nonlife to life to enable the transition from life to mind. (I'd think he would rather eliminate the concept of "transition" altogether and consider life-mind as a unified concept—perhaps like, in cosmology, the once apparent independent dimensions of space and time now unified by a single physical concept, spacetime.)

As a pioneer of enactivism (9.6.2), Thompson posits that "the enactive approach offers important resources for making progress on the explanatory gap" by explicating "selfhood and subjectivity from the ground up by accounting for the autonomy proper to living and cognitive beings." He extends the idea with "embodied dynamism," a key concept that combines dynamic systems and embodied approaches to cognition. While the former reflects enactivism, the latter is the enhancement (Thompson, 2002).

According to Thompson, the central idea of the dynamic systems approach is that cognition is an intrinsically temporal phenomenon expressible in "the form of a set of evolution equations that describe how the state of the system changes over time. The collection of all possible states of the system corresponds to the system's 'state space' or 'phase space,' and the ways that the system changes state correspond to trajectories in this space." Dynamic-system explanations, he says, consist of "the internal and external forces that shape such trajectories as they unfold in time. Inputs are described as perturbations to the system's intrinsic dynamics, rather than as instructions to be followed, and internal states are described as self-organized compensations triggered by perturbations, rather than as representations of external states of affairs" (Thompson, 2002).

To make real progress on the explanatory gap, Thompson says, "we need richer phenomenological accounts of the structure of experience, and we need scientific accounts of mind and life informed by these phenomenological accounts." My aim, he says, "is not to close the explanatory gap in a reductive sense, but rather to enlarge and enrich the philosophical and scientific resources we have for addressing the gap."

Calling on the philosophical tradition of phenomenology, inaugurated by Edmund Husserl and developed by others, primarily Maurice Merleau-Ponty, Thompson seeks to "naturalize" phenomenology by aligning its investigations with advances in biology and cognitive science and to complement science and its objectification of the world by reawakening basic experiences of the world via phenomenology. His main move is for cognitive science "to learn from the analyses of lived experience accomplished by phenomenologists …. which thus needs to be recognized and cultivated as an indispensable partner to the experimental sciences of mind and life" (Thompson, 2002).

The deeper convergence of the enactive approach and phenomenology, Thompson says, is that "both share a view of the mind as having to constitute its objects." He stresses that "constitute" does not mean fabricate or create, but rather "to bring to awareness, to present, or to disclose." Thus, "the mind brings things to awareness; it discloses and presents the world. Stated in a classical phenomenological way, the idea is that objects are disclosed or made available to experience in the ways they are thanks to the intentional activities of consciousness." Thompson argues that weaving together the phenomenological and neurobiological can "bridge the gap between subjective experience and biology, which defines the aim of neurophenomenology (9.6.4), an offshoot of the enactive approach" (Thompson, 2002).

9.6.5. Frank/Gleiser/Thompson's "The Blind Spot"

Astrophysicist Adam Frank, theoretical physicist Marcello Gleiser, and philosopher Evan Thompson elevate and promote "the primacy of consciousness" in that "There is no way to step outside consciousness and measure it against something else. Everything we investigate, including consciousness and its relation to the brain, resides within the horizon of consciousness." Lest they be misunderstood, the authors reject any inference that "the universe, nature, or reality is essentially consciousness or is somehow made out of consciousness," because "this does not logically follow." Such "a speculative leap," they say, goes beyond what we can know or establish on the basis of "consciousness as experienced from within and as an irreducible precondition of scientific knowledge." Furthermore, "this speculative leap runs afoul" of what they call "the primacy of embodiment," which "is as equally undeniable as the primacy of consciousness" (Frank et al., 2024, pp. 186, 188).

What now confronts us, Frank/Gleiser/Thompson say, is "a strange loop," where "horizonal consciousness subsumes the world, including our body experienced from within, while embodiment subsumes consciousness, including awareness in its immediate intimacy." The authors stress that "the primacy of consciousness and the primacy of embodiment enfold each other." They call for unveiling and examining this strange loop, which normally disappears from view and is forgotten in what they call *The Blind Spot*. They describe the Blind Spot as "humanity's lived experience as an inescapable part of our search for objective truth" (Frank et al., 2024, p. 189), and they seek "to reclaim the central place of human experience in the scientific enterprise by invoking the image of a 'Blind Spot'" (Gomez-Marin, 2024). In other words, they reject the way of thinking that "we can comprehend consciousness within the framework of reductionism, physicalism, and objectivism or, failing that, by postulating a dualism of physical nature versus irreducible consciousness that we could somehow grasp outside the strange loop." This is why they label the hard problem of consciousness an "artifact of the Blind Spot." It is "built into blind-spot metaphysics, and not solvable in its terms" because "it fails to recognize the ineliminable primacy of consciousness in knowledge" (Frank et al., 2024, p. 192).

Frank/Gleiser/Thompson see "only a few options for trying to deal with consciousness within the confines of the blind-spot worldview," and that "ultimately, they're all unsatisfactory, because they never come to grips with the need to recognize the primacy of consciousness and the strange loop in which we find ourselves." They argue that the three major options—neural correlates of consciousness (9.2.2); metaphysical bifurcation of physical reality and irreducible mental properties (whether naturalistic dualism, substance dualism or panpsychism—13, 15); and illusionism (9.1.1)—are all "within the ambit of the Blind Spot" (Frank et al., 2024, p. 196).

What Frank/Gleiser/Thompson offer is "a radically different approach beyond the Blind Spot." They reference papers by astrophysicist Piet Hut and cognitive psychologist Roger Shepard (Hut and Shepard, 1996), and neuroscientist Francisco Varela (1996), making the case for "a major overhaul of the science of consciousness based on recognizing the primacy of experience." They note "we inescapably use consciousness to study consciousness," such that "unless we recover from the amnesia of experience and restore the primacy of experience in our conception of science, we'll never be able to put the science of consciousness on a proper footing." A science of consciousness can work, all say, only if "experience really matters" (Frank et al., 2024, p. 218).

[29] Personal note: Evan Thompson's father was social philosopher and cultural critic William Irwin Thompson, who had great influence on me (RLK)—especially his books, *At the Edge of History* (1971) and *Passages about Earth* (1974). The influence would help lay the foundation for *Closer To Truth*.

The key, according to the authors, is "recognizing [both] the primacy of consciousness and the primacy of embodiment," which, they claim "changes how we think about the problem of consciousness." The problem for neuroscience "can no longer be stated as how the brain generates consciousness." Rather, "the problem is how the brain as a perceptual object within consciousness relates to the brain as part of the embodied conditions for consciousness, including the perceptual experience of the brain as a scientific object. The problem is to relate the primacy of consciousness to the primacy of embodiment without privileging one over the other or collapsing one onto the other. The situation is inherently reflexive and self-referential: instead of simply regarding experience as something that arises from the brain, we also have to regard the brain as something that arises within experience. We are in the strange loop" (Frank et al., 2024, pp. 219–220).

Frank/Gleiser/Thompson support Varela's neuroscience research program, "neurophenomenology" (9.6.3), based on "braiding together first-person accounts of consciousness with third-person accounts of the brain within the I-and-you experiential realm." They advocate that phenomenology and neuroscience "become equal partners in an investigation that proceeds by creating new experiences in a new kind of scientific workshop, the neurophenomenological laboratory. First-person experiential methods for refining attention and awareness (such as meditation), together with second-person qualitative methods for interviewing individuals about the fine texture of their experience, are used to produce new experiences, which serve as touchstones for advancing phenomenology. This new phenomenology guides investigations of the brain, while investigations of the brain are used to motivate and refine phenomenology in a mutually illuminating loop" (Frank et al., 2024, pp. 219–220). The authors call neurophenomenology "probably the strongest effort so far to envision a neuroscience of consciousness beyond the Blind Spot (Frank et al., 2024, p. 221). Consciousness, particularly human consciousness, is "an expression of nature and is a source of nature's self-understanding."

9.6.6. *Bitbol's radical neurophenomenology*

Philosopher of science and phenomenologist Michel Bitbol promotes a "radical neurophenomenology" in which a "tangled dialectic of body and consciousness" is the "metaphysical counterpart" and whose goal is to advance Varela's neurophenomenology project (9.6.3) of criticizing and dissolving the "hard problem" of consciousness (Bitbol, 2021a). Bitbol claims that the neurophenomenological approach to the "hard problem" is underrated and often misunderstood; indeed, "in its original version, neurophenomenology implies nothing less than a change in our own being to dispel the mere sense that there is a problem to be theoretically solved or dissolved. Neurophenomenology thus turns out to be much more radical than the enactivist kinds of dissolution" (9.6.2) (Bitbol and Antonova, 2016).

Did Varela himself have a theory to solve the hard problem? No, Varela declared (in Bitbol's report) "only a 'remedy'—the point being that "there exists a stance (let's call it the Varelian stance) in which the problem of the physical origin of primary consciousness, or pure experience, does not even arise." The implications, according to Bitbol, are that "the nature of the 'hard problem' of consciousness is changed from an intellectual puzzle to an existential option." The "constructivist content," he says, is that "The role of ontological prejudice about what the world is made of (a prejudice that determines the very form of the 'hard problem' as the issue of the origin of consciousness out of a pre-existing material organization) is downplayed" (Bitbol, 2012).

Bitbol blames "the standard (physicalist) formulation of this problem" for both generating it and turning it into "a fake mystery." But he recognizes that dissolving the hard problem is very demanding for researchers, because "it invites them to leave their position of neutral observers/thinkers, and to seek self-transformation instead." Bitbol's approach "leaves no room for the 'hard problem' in the field of discourse, and rather deflects it onto the plane of attitudes." This runs the risk, he says, of "being either ignored or considered as a dodge" (Bitbol, 2021a).

Bitbol's method is "a metaphysical compensation for the anti-metaphysical premise of the neurophenomenological dissolution of the 'hard problem.'" This can be achieved, he says, by designing this alternative metaphysics "to keep the benefit of a shift from discourse to ways of being, which is "the latent message of neurophenomenology" (Bitbol, 2021a). In its most radical version, "neurophenomenology asks researchers to suspend the quest of an objective solution to the problem of the origin of subjectivity, and clarify instead how objectification can be obtained out of the coordination of subjective experiences. It therefore invites researchers to develop their inquiry about subjective experience with the same determination as their objective inquiry." Bitbol proposes a methodology to explore lived experience faithfully (via micro-phenomenological interviews retrieving or "evoking past experiences") and thereby "addresses a set of traditional objections against introspection" (Bitbol and Petitmengin, 2017).

Bitbol gives neuroscience no privilege, priority or pride of place. "The effective primacy of lived experience should be given such prominence that every other aspect, content, achievement, distortion, and physicalist account of consciousness, is made conditional upon it." From a (radical) phenomenological standpoint, he says, "one must not mistake objectivity for reality. Reality is what is given and manifest, whereas objectivity is what is constituted by extracting structural invariants from the given experience. Along with this phenomenological approach, an objective science is not supposed to disclose reality as it is beyond appearances, but only to circumscribe some intersubjectively recognized features of the appearing reality." Having said that, Bitbol stresses that "neuroscientific data should not be granted a higher ontological status than phenomenological descriptions; they should not be given the power to render a compelling verdict about what is real and what is deceptive in our experience." Thus, he sums up: "from a phenomenological standpoint, the neuro-phenomenological correlation is plainly perceived as an extension of the lived sense of embodiment, not as a sign that some naturalistic one-directional 'fundamental dependence' of consciousness on the bodily brain is taking place" (Bitbol, 2015).

Bitbol's affirmative solution is to formulate a "dynamical and participatory conception of the relation between body and consciousness … with no concession to standard positions such as physicalist monism and property dualism." Bitbol's conception is based on Varela's formalism of "cybernetic dialectic," "a geometrical model of self-production," and it is "in close agreement with Merleau-Ponty's 'intra-ontology': an engaged ontological approach of what it is like to be, rather than a discipline of the contemplation of beings" (Bitbol, 2021a).

Bitbol's approach to quantum physics complements his "radical phenomenology," such that quantum mechanics becomes more a "symbolism of atomic measurements," rather than "a description of atomic objects." He supports the notion that "quantum laws do not express the nature of physical objects, but only the bounds of experimental information." Similarly, Bitbol supports QBism, where the wave function's probabilities are said to be, shockingly (to me), *Bayesian* probabilities, which means they relate to prior subjective degrees of belief about the system, paralleling some ideas in phenomenology (Bitbol, 2023).

Bitbol calls out "three features of such non-interpretational, non-committal approaches to quantum physics" that "strongly evoke the phenomenological epistemology." These are: "their deliberately first-person stance; their suspension of judgment about a presumably external domain of objects, and subsequent redirection of attention towards the activity of constituting these objects; their perception-like conception of quantum knowledge." Moreover, Bitbol claims that these new approaches of quantum physics go beyond phenomenological epistemology and "also make implicit use of a phenomenological ontology." He cites Chris Fuch's "participatory realism" that "formulates a non-external variety of realism for one who is deeply immersed in reality," adding, "but participatory realism strongly resembles Merleau-Ponty's endo-ontology, which is a phenomenological ontology for one

who deeply participates in Being" (Bitbol, 2020; Gefter, 2015).

QBist theorists assert that "quantum states are 'expectations about experiences of pointer readings,'" rather than expectations about pointer positions. Their focus on lived experience, not just on macroscopic variables, is tantamount to performing the transcendental reduction instead of stopping at the relatively superficial layer of the life-world reduction." Bitbol believes that "quantum physics indeed gives us several reasons to go the whole way down to the deepest variety of phenomenological reduction … not only reduction to experience, or to 'pure consciousness,' but also reduction to the 'living present'" (Bitbol, 2021b).

9.6.7. Direct perception theory

Direct Perception Theory is the idea that "the information required for perception is external to the observer; that is, one can directly perceive an object based on the properties of the distal stimulus alone, unaided by inference, memories, the construction of representations, or the influence of other cognitive processes" (APA, website). Philosopher Ned Block describes non-mainstream views of phenomenal consciousness that take it to work via this kind of "a direct awareness relation to a peculiar entity like a sense datum [i.e., that which is immediately available to the senses] or to objects or properties in the environment." This direct awareness would seem to have to be "a primitive unanalyzable acquaintance relation that is not a matter of representation." According to these direct realist or naïve realist theories of consciousness, "the phenomenal character of a perceptual experience is object-constituted in the sense that a perceptual experience of a tomato depends for its existence and individuation on the tomato. Any experience that is of a different tomato will have a different phenomenal character, even if it is phenomenally indistinguishable and even if the different tomato is exactly the same in all its properties and causes exactly the same activations in the brain." Even subjectively indistinguishable hallucinatory experience would have to be different in phenomenal character as well (Block, 2023).

9.6.8. Gibson's ecological psychology

Experimental psychologist James J. Gibson proposes an "embodied, situated, and non-representational" approach to perception (which, while not a surrogate for phenomenal consciousness, has features in common). Gibson attacks both behaviorism and cognitivism (e.g., information processing), arguing for direct perception and direct realism. Gibson calls his overarching theory, "Ecological Psychology," and while his specific aim is "to offer a third way beyond cognitivism and behaviorism for understanding cognition," an extension to consciousness can be cautiously inferred (Lobo et al., 2018; Gibson, 2024).

Gibson maintains that there is far more information available to our perceptual systems than we are consciously aware of. He posits that "the optical information of an image is not so much an impression of form and color, but rather of invariants. A fixated form of an object only specifies certain invariants of the object, not its solid form." Perceptual learning is said to be "a process of seeing the differences in the perceptual field around an individual" (Gibson, 2014, 2024).

Gibson rejects "the premise of the poverty of the stimulus, the physicalist conception of the stimulus, and the passive character of the perceiver of mainstream theories of perception." Rather, he has the main principles of ecological psychology as "the continuity of perception and action" and the "organism-environment system as unit of analysis" (Lobo et al., 2018).

Significantly, Gibson develops the original idea of "affordances" (he coins the term), which are the ways the environment provides opportunities for and motivates actions of animals—human examples include steep slopes inspiring the design of stairs and deposits of hydrocarbons encouraging drilling. Gibson defends the radical idea that "when we perceive an object we observe the object's affordances and not its particular qualities" because it is both more useful and easier, which would mean that affordances are the objects of perception (Gibson, 2024; Lobo et al., 2018).

If perception is direct, and affordances provide the possibilities, then affordances are a kind of state space of the mind. That environmental affordances may have enabled or selected for consciousness would be consistent with embodied and enactive theories of consciousness.

9.7. Relational theories

Relational Theories of consciousness are those explanations whose distinctive feature is some kind of active or transformative connection with something other than brain circuits and pathways themselves.

9.7.1. A. Clark's extended mind

The extended mind, according to philosopher Andy Clark, features an "active externalism," based on the participatory role of the environment in driving cognitive processes. He asserts that when the human organism is linked with an external entity in a two-way interaction, a "coupled system" is created that can be conceptualized as a cognitive system in its own right (independent of the two components). This is because all the components in the system play an active causal role, and they jointly govern behavior in the same sort of way that cognition in a single system (brain) usually does. To remove the external component is to degrade the system's behavioral competence, just as it would to remove part of its brain. Clark's thesis is that this sort of coupled process counts equally well as a cognitive process, whether or not it is wholly in the head (Clark and Chalmers, 1998).

Clark concludes his book, *Supersizing the Mind*, by inviting us "to cease to unreflectively privilege the inner, the biological, and the neural … The human mind, viewed through this special lens, emerges at the productive interface of brain, body, and social and material world." He marvels that "minds like ours emerge from this colorful flux as surprisingly seamless wholes" (Clark, 2010).

According to Owen Flanagan, "Walking, talking and seeing are all things the enactive, embodied, extended (code words for this hip new view) mind does in the world." Clark "provides the best argument I've seen for the idea that minds are smeared over more space than neuroscience might have us believe, and that mind will continue spreading to other nooks and crannies of the universe as cognitive prostheses proliferate" (Flanagan, 2009).

9.7.2. Noë's "out of our heads" theory

Philosopher Alva Noë argues that only externalism about the mind and mental content, which requires active and continuous engagement between the brain and its environment, body and beyond, can succeed as a theory of consciousness (Noë, 2010). He uses his attention-alerting phrase "Out of Our Heads" as descriptor, not as metaphor, and he applies it literally. His hypothesis is that expanding the locus of where consciousness occurs may help explain its essence and mechanism. What does this actually mean?

Noë takes issue with both dualism and materialism; attacking the weaknesses of each is not hard going. "We have no better idea how the actions of cells in the head give rise to consciousness than we do how consciousness arises out of immaterial spiritual processes." So, brain science, he says, while it has the imprimatur of the scientific worldview, is not really going anywhere. It's like trying to understand what makes a dance "a dance" by studying the movement of muscles (Noë, 2007).

He challenges the assumption that an event in the brain is alone sufficient for consciousness. "We spend all our lives, not as free-floating brains; we're embodied, we're environmentally embedded; we're socially nurtured from the very beginnings of our lives." His idea is that "The world shows up for us," with "multiple layers of meaning."

Noë offers an alternative framework, a novel way of thinking. "There are lots of discrete processes going on inside the head. But that's not where we should look for consciousness. We occupy a place in the world—all sorts of things are going on around us—and consciousness is that activity of keeping tabs, keeping touch, paying attention to,

interacting with the world."

But what does it mean to say consciousness "is" that activity? "Is" as … "part of the process?" Or "enabling," "bringing about" or "causing"? Or, in the strong sense of "is" as identity theory?

Noë distinguishes the meaning and purposes of consciousness, which take place "out of our heads," from the mechanical locus of consciousness, the substrate on which its symbols are physically encoded and manipulated.

Noë uses dreams as corroborating evidence that consciousness occurs outside of the brain. He distinguishes dreams from real-life experiences, in that the latter has greater density, detail and robustness. "You can't experience in a dream everything that you can experience outside of a dream" (Noë, 2007).

Consciousness to Noë means "How the world shows up for us depends not only on our brains and nervous systems but also on our bodies, our skills, our environment, and the way we are placed in and at home in the world." This does not happen automatically, passively, done to the organism, but it is what the organism must do deliberately, proactively. "We achieve access to the world. We enact it by enabling it to show up for us.… If I don't have the relevant skills of literacy, for example, the words written on the wall do not show up for me" (Noë, 2012).

He stresses that consciousness isn't just a matter of events triggered inside us by things outside us because things are triggered inside us all the time by all sorts of things outside of us and they don't rise to consciousness. Much depends on context, interest, knowledge and understanding.

Thus, consciousness is what happens when sentient creatures interact with their environment via their brains; consciousness is not what their brains are doing to them. A science of consciousness, Noë says, must explain the role the brain is playing in a dynamic active involvement. It's not just that consciousness happens in the brain; it's not like that. "We are not our brains" (Noë, 2012).

9.7.3. Loorits's structural realism

Philosopher Kristjan Loorits's Structural Realism posits that "conscious experiences are fully structural phenomena that reside in our brains in the form of complex higher-order patterns in neural activity." He claims that the structural view of consciousness solves both the hard problem and the problem of privacy (Loorits, 2019).

On the hard problem, according to Loorits, while some properties of our conscious experiences seem to be qualitative and non-structural—qualia—"these apparently nonstructural properties are, in fact, fully structural." He conjectures that qualia are "compositional with internal structures that fully determine their qualitative nature" (Loorits, 2019), that "qualia are the structures of vast networks of unconscious associations, and that those associational structures can be found in our neural processes." He makes the ambitious prediction that "with the proper brain-stimulating technology, it should be possible to reveal the structural nature of qualia to the experiencing subject directly" (Loorits, 2019). Loorits concludes that "consciousness as a whole can be seen as a complex neural pattern that misperceives some of its own highly complex structural properties as monadic and qualitative. Such neural pattern is analyzable in fully structural terms and thereby the hard problem is solved (Loorits, 2014). (As for "the notion of structure," Loorits's Structural Realism has some structures existing in the world in an objective sense and has conscious experiences among such structures [Loorits, 2019].)

On the privacy problem, according to Loorits, while our "powerful intuition" is that "the content of my consciousness is directly accessible only to me"—a brain-bound internalist approach to consciousness, which comports well with neurobiological theories—some argue that "we can only talk about phenomena whose defining properties are known to us from the public realm." According to this externalist approach, "if our conscious experiences were entirely private, we could not talk or theorize about them"—a way of thinking that suggests "conscious experiences should be understood in terms of an organism's relationship to its socio-physical environment" (Loorits, 2019).

In defending internalism as the "location" of consciousness, Loorits argues that "structural phenomena are describable and analyzable in public terms even if those phenomena themselves are private." Moreover, "the structure of our consciousness is always present in our neural processes and only sometimes (additionally) in an extended system that includes elements of the environment" (Loorits, 2018).

Loorits offers modest support to illusionists who propose that "the apparently non-structural features of consciousness are in fact fully structural and merely seem to be non-structural." He argues that "such a position is tenable, but only if the non-structural 'seemings' are interpreted as perspectival phenomena and not as theorists' fictions or absolute nothingness" (Loorits, 2022).

When George Musser was musing that qualia might be relational (9.7), he met with Loorits, and to Musser's surprise, Loorits "had gone off the idea." The disjunction is between third and first-person perspectives, where the former is how qualia is explained relationally and the latter is precisely the hard problem. According to Musser, Loorits's current thinking was that "qualia may well be relational behind the scenes, but as long as they feel intrinsic to us, they still elude scientific description." Loorits concluded, "There is still a hard problem in a sense that we seem to be able to experience qualia without being aware of their relational components" (Musser, 2023a,b). (I tip my hat when a philosopher changes their mind.)

9.7.4. Lahav's relativistic theory

Physicist Nir Lahav characterizes consciousness as a physical phenomenon that is relative to the measurements of a "cognitive frame of reference." Just as different observers can have different measurements of velocity in a relativistic context, the same is true for consciousness. Two people can have different cognitive frames of reference, experiencing conscious awareness for themselves but only measuring brain activity for the other. The brain doesn't create conscious experiences through computations; rather, conscious experiences arise due to the process of physical measurement. Different physical measurements in different frames of reference manifest different physical properties, even when measuring the same phenomenon. This leads to different manifestations of conscious experience and brain activity in separate cognitive frames (Lahav and Neemeh, 2022).

9.7.5. Tsuchiya's relational approach to consciousness

Neuroscientist Nao Tsuchiya's relational approach to consciousness is not so much a theory of consciousness per se but more a fresh methodology, "an alternative approach to characterize, and eventually define, consciousness through exhaustive descriptions of consciousness's relationships to all other consciousnesses." His approach is founded in category theory (i.e., mathematical structures and their relations), which is used to characterize the structure of conscious phenomenology as a category and describe the interrelationships of members with mathematical precision. Tsuchiya proposes several possible definitions of categories of consciousness, both in terms of level and contents—the objective being for these conceptual tools to clarify complex theoretical concepts about consciousness, which have been long discussed by philosophers and psychologists, and for such conceptual clarification to inspire further theoretical and empirical research. To the extent that the project is successful, it will support relational theories of consciousness (Tsuchiya and Saigo, 2021).

9.7.6. Jaworski's hylomorphism

Philosopher William Jaworski argues that the hard problem of consciousness arises only if hylomorphism is false. Hylomorphism is the claim that structure is a basic ontological and explanatory principle, and is responsible for individuals being the kinds of things they are, and having the powers or capacities they have. As Jaworski explains, "A human is not a random collection of physical materials, but an individual composed of physical materials with a structure that accounts for

what it is and what it can do—the powers it has. What is true of humans is true of their activities as well." Structured activities, he says, include perceptual experiences, which means that everything about a perceptual experience, including its phenomenal character, can be explained by describing the perceiver's structure: perceptual subsystems, the powers of those subsystems, and the coordination that unifies their activities into the activity of the perceiver as a whole. Conscious experiences, Jaworski concludes, "thus fit unproblematically into the natural world—just as unproblematically as the phenomenon of life" (Jaworski, 2020).

According to Jaworski, from a hylomorphic perspective, "mind-body problems are byproducts of a worldview that rejects structure, and which lacks a basic principle which distinguishes the parts of the physical universe that can think, feel, and perceive from those that can't. Without such a principle, the existence of those powers in the physical world can start to look inexplicable and mysterious." But if mental phenomena are structural phenomena, he says, then they are part of the physical world and thus "hylomorphism provides an elegant way of solving mind-body problems" (Jaworski, 2016).

While hylomorphism exemplifies a suite of arguments purporting to undermine the hard problem, its own challenge seems two-fold: (i) by defining structure as primitive and fundamental, it almost embeds the desired conclusion in the definitional premise; and (ii) by not distinguishing kinds of structure, all structure holds the same level of ultimate explanation, which may not fit consciousness.

9.7.7. Process theory

A process theory of consciousness is founded on process philosophy, the metaphysical idea that fundamental reality is dynamic, change, shift—the action of becoming.[30] With respect to consciousness, process philosophy has refused to bifurcate human experience from nature, and as a consequence, process philosophy holds to a "panexperientialist" ontology where experience goes all the way down in nature, and consciousness genuinely emerges as an achievement of the evolution of experience through time. Only in the case of God (if God exists, of course) does consciousness belong to nature as an ontological primitive. (Davis, 2020, 2022; Faber, 2023).

David Ray Griffin suggests that "panexperientialist physicalism," by allowing for "compound individuals" and thereby a "nondualistic interactionism" that combines these strengths, can provide a theory that overcomes the problems of materialist physicalism (Griffin, 1997). Panexperientialist physicalism, he says, portrays the world as comprised of creative, experiential, physical-mental events. His process-type panexperientialism agrees with materialism that there is only one kind of stuff, but enlarges "energy" to "experiential creativity" (thus distinguishing it from panpsychism, 13.12). Process panexperientialists assume that it lies in the very nature of things for events of experiential creativity to occur—for partially self-creative experiences to arise out of prior experiences and then to help create subsequent experiences. The process by which our (sometimes partly conscious) experiences arise out of those billions of events constituting our bodies at any moment is simply the most complex example of this process—and the only one the results of which we can witness from the inside.

[30] I wanted to include a process philosophy approach to consciousness, but decided it could not by itself carry a separate category, because consciousness per se is not a central concern in process philosophy. Given that the process of becoming implies shifting relationships between things, over time and space, I include process philosophy here in "Relational Theories." Considering its advocacy of "panexperientialism," Panpsychism was the initial option, but I thought it could prove misleading to tie the two together metaphysically, because the meaning of panexperientialism in process philosophy differs subtly from its meaning in philosophy of mind broadly. So, Solomonically, I split the baby, including Process Theory in both Relational Theories under Materialism (9.7.7) and in Panpsychism (14.12).

9.8. Representational theories

Representational Theories of consciousness elevate the explanatory power of mental representations, which are inner-perceived notions or imagery of things, concrete or abstract, that are not currently being presented to the senses. Representational theories seek to explain consciousness in terms of mental representations rather than simply as neural or brain states. Mental representations utilize cognitive symbols that can be manipulated in myriad ways to describe, consider and explain an endless variety of thoughts, ideas, and concepts (Mental representation, 2024. *Wikipedia*). According to strict representationalism, conscious mental states have no mental properties other than their representational properties (Van Gulick, 2019).

According to philosopher Michael Tye, "representationalism is a thesis about the phenomenal character of experiences, about their immediate subjective 'feel'. At a minimum, the thesis is one of supervenience: necessarily, experiences that are alike in their representational contents are alike in their phenomenal character. So understood, the thesis is silent on the nature of phenomenal character. Strong or pure representationalism goes further. It aims to tell us what phenomenal character is." In this view, "phenomenal character is one and the same as representational content that meets certain further conditions" (Tye, 2002).

Philosopher Fred Dretske's "Representational Thesis" is the claim that: (1) All mental facts are representational facts, and (2) All representational facts are facts about informational functions (Dretske, 2023).

Philosopher Amy Kind observes that "as philosophers of mind have begun to rethink the sharp divide that was traditionally drawn between the phenomenal character of an experience (what it's like to have that experience) and its intentional content (what it represents), representationalist theories of consciousness have become increasingly popular" (Kind, 2010).

While almost all theories of consciousness have representational features, the representational theories themselves, including those that follow, are distinguished by the more robust claim that their representational features are what explain consciousness (Van Gulick, 2019). A hurdle for all theories is the need to explain phenomenology in terms of *intentionality*, the "aboutness" of mental states, under the assumption that intentionality must be represented (Lycan, 2019).

This is Jerry Fodor's challenge: "I suppose that sooner or later the physicists will complete the catalog they've been compiling of the ultimate and irreducible properties of things. When they do, the likes of spin, charm, and charge will perhaps appear on their list. But aboutness surely won't; intentionality simply doesn't go that deep" (Fodor, 1989).

9.8.1. First-order representationalism

First-order representationalism (FOR) seeks to account for consciousness in terms of, or by reducing to, external, world-directed (or first-order) intentional states (Gennaro, n.d.). In other words, consciousness can be explained, primarily, by understanding how the directedness of our mental states at objects and states of affairs in the world is generated directly by those objects and states of affairs (Searle, 1979).

Fred Dretske asserts that "the phenomenal aspects of perceptual experiences are one and the same as external, real-world properties that experience represents objects as having." He argues that "when a brain state acquires, through natural selection, the function of carrying information, then it is a mental representation suited (with certain provisos) to being a state of consciousness." (In contrast, "representations that get their functions through being recruited by operant conditioning, on the other hand, are beliefs.") (Dretske, 1997).

As philosopher Peter Carruthers explains, "the goal [of FOR] is to characterize all of the phenomenal—'felt'—properties of experience in terms of the representational *contents* of experience (widely individuated). On this view, the difference between an experience of red and an experience of green will be explained as a difference in the properties

represented—reflective properties of surfaces, say—in each case. And the difference between a pain and a tickle is similarly explained in representational terms—the difference is said to reside in the different properties (different kinds of disturbance) represented as located in particular regions of the subject's own body" (Carruthers, 2000).

Carruthers recounts his unusual transition from higher-order theory to first-order theory.[31] He originally explained phenomenal consciousness in terms of "dispositionalist higher-order thought theory," which he characterized as "a certain sort of intentional content ('analog', or fine-grained), held in a special-purpose short-term memory store in such a way as to be available to higher-order thoughts … all of those contents are at the same time higher-order ones, acquiring a dimension of *seeming or subjectivity*" (Carruthers, 2000). (One of his goals, he says, is "to critique mysterian [10.2] and property-dualist accounts of phenomenal consciousness … [by] defending the view that consciousness can be reductively explained in terms of active non-conceptual representations." He sought to "disarm (and explain away the appeal of) the various 'hard problem' thought experiments (zombies, explanatory gaps, and the rest)" (Carruthers, 2017).

The later Carruthers concludes that the earlier Carruthers had "rejected first-order representational theories of consciousness on inadequate grounds." As a result, "since there is extensive evidence that conscious experience co-occurs with the global broadcasting of first-order non-conceptual contents in the brain [9.2.3], and since this evidence is most easily accommodated by first-order representationalism, the latter is preferable to any form of higher-order account" (Carruthers, 2017).

Philosopher Neil Mehta and anesthesiologist George Mashour describe FOR as consisting of "sensory representations directly available to the subject for action selection, belief formation, planning, etc." They posit a neuroscientific framework, according to which neural correlates of general consciousness include prefrontal cortex, posterior parietal cortex, and non-specific thalamic nuclei, while neural correlates of specific consciousness include sensory cortex and specific thalamic nuclei" (Mehta and Mashour, 2013).

FOR's core philosophical idea, Mehta and Mashour state, is that "any conscious state is a *representation*, and what it's like to be in a conscious state is wholly determined by the *content* of that representation. By definition, a representation is about something, and the content of a representation is what the representation is about. For instance, the word 'dolphins' (representation) is about dolphins (content)." But, they clarify, "a representation is not identical to its content." The English word "dolphins" has eight letters, but dolphins themselves do not have any letters. "Conversely, dolphins swim, but the word 'dolphins' does not swim."

This distinction leads to the strong view that neural states seem to have very different properties than conscious perceptions. "For instance, when someone consciously perceives the color orange, normally there is nothing orange in that person's brain. First-order representationalists explain this by holding that a conscious perception of orange is a representation of orange, and (as the 'dolphin' example shows) the properties of a representation can be very different from the properties of its content" (Mehta and Mashour, 2013).

FOR's core neurobiological idea is that "each specific type of conscious state corresponds to a specific type of neural state." Ned Block seeks to "disentangle the neural basis of phenomenal consciousness from the neural machinery of the cognitive access that underlies reports of phenomenal consciousness." He argues that, in a certain sense, "phenomenal consciousness overflows cognitive accessibility." He posits that "we can find a neural realizer of this overflow if we assume that the neural basis of phenomenal consciousness does not include the neural basis of cognitive accessibility and that this assumption is justified (other things being equal) by the explanations it allows" (Block, 2007c).

[31] Again, I love when a philosopher changes their mind.

Block hypothesizes that the conscious experience of motion is a certain kind of activation of visual area V5, which suggests that sensory systems are the neural correlates of sensory consciousness. He further speculates that what's required for consciousness in general are connections between these cortical regions and the thalamus, "which suggests that sensory and perhaps post-sensory systems … are the neural correlates of general consciousness, as well" (Block, 2007c).

Block says he favors the first-order point of view, and if it is right, he says, "It may be conscious phenomenology that promotes global broadcasting, something like the reverse of what the global workspace theory of consciousness supposes. First-order phenomenology may be a causal factor in promoting global broadcasting; but according to the global workspace theory, global broadcasting constitutes consciousness rather than being caused by it" (Block, 2023, pp. 8–9).

With a pungent example, Block compares first-order representationalism with higher-order representationalism (9.8.3), higher-order theories (HOT). "We have two perceptions that equally satisfy the descriptive content of the HOT, but one and not the other causes the HOT. But that gives rise to the problem of how a thought to the effect that I am smelling vomit could make a perception of crimson a conscious perception. The perception of crimson could cause the HOT while a simultaneous first-order smell-representation of vomit does not cause any higher-order state. The consequence would be that the perception of crimson is a conscious perception and the perception of vomit is not, even though the subject experiences the perception of crimson as if it were the perception of vomit." Block concludes that "a descriptivist view based on content is inadequate," and that "the difficulty for the HOT theory is that it is unclear what relation has to obtain between a HOT and a perception for the perception to be conscious" (Block, 2023, pp. 425–426).

9.8.2. Lamme's recurrent processing theory

Neuroscientist Victor Lamme proposes Recurrent Processing Theory, which stresses brain sensory systems that are massively interconnected and involve feedforward and feedback connections, as being necessary and sufficient for consciousness. The visual system provides a case where "forward connections from primary visual area V1, the first cortical visual area, carry information to higher-level processing areas, and the initial registration of visual information involves a forward sweep of processing." Moreover, many feedback connections link visual areas with other brain regions, which, later in processing, are activated and thereby yield dynamic activity within the visual system (Wu, 2018).

Lamme proposes four stages of visual processing: Stage 1: Visual signals are processed locally within the visual system (i.e., superficial feedforward processing). Stage 2: Visual signals travel further forward in the processing hierarchy where they can influence action (i.e., deep feedforward processing). Stage 3: Information travels back into earlier visual areas, leading to local recurrent processing (i.e., superficial recurrent processing). Stage 4: Information activates widespread brain areas (i.e., widespread recurrent processing) (Wu, 2018).

According to Lamme, it is the recurrent processing in Stage 3, which is a first-order theory and can occur in both sensory and post-sensory areas, that he claims to be necessary and sufficient for consciousness. In other words, "for a visual state to be conscious is for a certain recurrent processing state to hold of the relevant visual circuitry" (Wu, 2018).

Ned Block calls Recurrent Processing Theory "basically a truncated form of the global workspace account: It identifies conscious perception with the recurrent activations in the back of the head without the requirement of broadcasting in the global workspace." Block points out that "first-order theories do not say that recurrent activations are by themselves sufficient for consciousness. These activations are only sufficient given background conditions. Those background conditions probably include intact connectivity with subcortical structures." What then is "enough for conscious perceptual phenomenology" is "the active recurrent loops in perceptual areas plus background conditions." Block

concludes: "So long as high-level representations participate in those recurrent loops, conscious high-level content is assured" (Block, 2023, pp. 8–9).

Lamme critiques Global Workspace Theory [9.2.3] as "all about access but not about seeing" (even though his Stage 4 is consistent with global workspace access). The crucial distinction is that Global Workspace Theory has recurrent processing at Stage 4 as necessary for consciousness, while Recurrent Processing Theory has recurrent processing at Stage 3 as sufficient. The latter would enable phenomenal consciousness without access by the global neuronal workspace (Wu, 2018).

Overall, Lamme avers that "neural and behavioral measures should be put on an equal footing" and that "only by moving our notion of mind towards that of brain can progress be made" (Lamme, 2006). He depicts "a notion of consciousness that may go against our deepest conviction: 'My consciousness is mine, and mine alone.' It's not," he says (Lamme, 2010).

9.8.3. *Higher-order theories*

According to Higher-Order Theories of consciousness, what makes a perception conscious is the presence of an accompanying cognitive state about the perception. This means that phenomenal consciousness is not immediate awareness of sensations. Rather, it is the higher-level sensing of those sensations, a product of second-order thoughts about first-order perceptions or mental states—a two-level process. Higher-Order Theories are distinguished from other cognitive accounts of phenomenal consciousness which assume that first-order perceptions or mental states can themselves be directly conscious—a one-level process (9.8.1, 9.8.2) (Carruthers, 2020, Higher-order theories of consciousness, 2023).

According to Peter Carruthers, "humans not only have first-order non-conceptual and/or analog perceptions of states of their environments and bodies, they also have second-order non-conceptual and/or analog perceptions of their first-order states of perception." This higher-order perception theory holds that "humans (and perhaps other animals) not only have sense-organs that scan the environment/body to produce fine-grained representations, but they also have inner senses which scan the first-order senses (i.e. perceptual experiences) to produce equally fine-grained, but higher-order, representations of those outputs." Hence, Higher-Order Theories are also called "inner-sense theory." Notably, "the higher-order approach does not attempt to reduce consciousness directly to neurophysiology but rather its reduction is in mentalistic terms, that is, by using such notions as thoughts and awareness" (Cardenas-Garcia, 2023).

The main motivation driving higher-order theories of consciousness, according to Carruthers, "derives from the belief that all (or at least most) mental-state types admit of both conscious and unconscious varieties … And then if we ask what makes the difference between a conscious and an unconscious mental state, one natural answer is that conscious states are states that we are aware of." This translates into the view that conscious states are states "that are the objects of some sort of higher-order representation—whether a higher-order perception or experience, or a higher-order thought" (Cardenas-Garcia, 2023).

Various flavors of higher-order theories can be distinguished, including the following (Cardenas-Garcia, 2023):

> Actualist Higher-Order Thought Theory (championed by David Rosenthal): A phenomenally conscious mental state is a state that is the object of a higher-order thought, and which causes that thought non-inferentially.
>
> Dispositionalist Higher-Order Thought Theory: A phenomenally conscious mental state is a state that is available to cause (non-inferentially) higher-order thoughts about itself (or perhaps about any of the contents of a special-purpose, short-term memory store).
>
> Self-Representational Theory: A phenomenally conscious mental state is a state that, at the same time, possesses an intentional content, thereby in some sense representing *itself* to the person who is the subject of that state.

According to Ned Block, there are two approaches to higher-order thought (HOT) theories of consciousness. The "double representation" approach says that the HOT involves a distinct coding of the perceptual content, such that a conscious perception will be "accompanied" by a thought of that experience, giving two representations of the conscious experience, one perceptual, one cognitive and conceptual. He considers it "mysterious" how a perception can be conscious. The second version of HOT has a thought or at least a cognitive state that makes a perception conscious but that thought does not itself have any perceptual content. Block refers to Hakwan Lau, who sometimes describes the higher-order state as a "pointer" to a first-order state. The pointer theory is cognitive in that the pointer is a thought, but it is not conceptualist since it involves no concept of a conscious experience involved in the thought that is supposed to make a perception conscious (Block, 2023, pp. 425–426).

Lau himself argues that the key to characterizing consciousness lies in its connections to belief formation and epistemic justification on a subjective level (Lau, 2019a); he describes consciousness as "a battle between your beliefs and perceptions" (Lau, 2019b). A clue, he suggests—at least at the level of functional anatomy—is that the neural mechanisms for conscious perception and sensory metacognition are similar, sensory metacognition meaning the monitoring of the quality or reliability of internal perceptual signals. Both mechanisms involve neural activity in the prefrontal and parietal cortices, outside of primary sensory regions (9.8.4).

Reflexive theories, which link consciousness and self-awareness, are either a sister or a cousin of Higher-Order Theories. They differ in that reflexive theories situate self-awareness within the conscious state itself rather than in an independent meta-state focusing on it. The same conscious state is both intentionally outer-directed awareness of external perceptions and intentionally inner-directed awareness of self-sense. A strong claim is that this makes reflexive awareness a central feature of conscious mental states and thereby qualifies as a theory of consciousness. Whether reflexive theories are variants of Higher-Order Theory ("sister") or a "same-order" account of consciousness as self-awareness ("cousin") is in dispute (Van Gulick, 2019).

Social psychologist Alexander Durig claims that our two brain hemispheres, operating as two brains, aware of each other and interacting with each other, exist in a system of "interactive reflexivity," and it is this reflexivity, while being perpetually aware of the world and each other's perception of the world, that is the foundation of consciousness (Durig, 2023).

9.8.4. *Lau's perceptual reality monitoring theory*

Cognitive neuroscientist Hakwan Lau introduces Perceptual Reality Monitoring Theory, which he says is an empirically-grounded higher-order theory of conscious perception. He proposes that conscious perception in an agent occurs "if there is a relevant higher-order representation with the content that *a particular first-order perceptual representation is a reliable reflection of the external world right now*. The occurrence of this higher-order representation gives rise to conscious experiences with the perceptual content represented by the relevant first-order state." This structure allows us to distinguish "reality from fantasy in a generally reliable fashion" (Lau, 2019a).

The agent is not conscious of the content of this higher-order representation itself, Lau says, "but the representation is instantiated in the system in such a way to allow relevant inferences to be drawn (automatically) and to be made available to the agent (on a personal level, in ways that make the inferences feel subjectively justified)" (Lau, 2019a). It is a *subpersonal* process. "That is, we don't have to think hard to come up with this higher-order representation. It's not a thought in that sense." Rather, "this higher-order representation serves as a tag or label indicating the suitable epistemic status of the sensory representation, and functions as a gating mechanism to route the relevant sensory

information for further cognitive processing" (Lau, 2022, p. 28).

This structural mechanism, Lau asserts, sets his view "apart from global theories" (9.8.3). This is because, he says, "such further processing is only a potential consequence, but not a constitutive part of the subjective experience … In other words, consciousness is neither cognition nor metacognition. It is the mechanistic interface right between perception and cognition." Lau believes that "such higher-order mechanisms likely reside within the mammalian prefrontal cortex, where the functions of perceptual metacognition are also carried out" (Lau, 2022, p. 28).

But can we ask what happens when higher-order representation is missing? Wouldn't subjective experience also be missing? This explains, Lau says, "why sometimes sensory representations alone do not lead to conscious experiences at all, as in conditions like blindsight, where, because of brain damage, a person (or an animal) is able to respond accurately to visual stimuli while denying any conscious awareness of them" (Lau, 2022, pp. 35–36).

Blindsight, in fact, is a litmus test for any theory of consciousness and Lau claims his theory offers the most coherent explanation: Blindsight "occurs when a first-order representation occurs without the corresponding higher-order representation … That's why the perceptual capacity is there (due to the first-order representations), but the phenomenology of conscious perception is missing" (Lau, 2019b).

Lau says his theory is a functionalist account. As such, he says, "some animals may not be conscious. And yet, perhaps even a robot or computer program could be." He highlights "the role of memory in conscious experience, even for simple percepts. How an experience feels depends on implicit memory of the relationships between different perceptual representations within the brain" (Lu et al., 2022).

Lau critiques both the global view of consciousness (9.2.3) and the local view (9.8.1 and 9.8.2) as "polar extremes," arguing that his own intermediate or centrist position is superior (Lau, 2022, pp. 25, 26, 130). As part of his model, he takes from artificial intelligence the idea of a "discriminator," which can distinguish between "real" and "self--generated" images (Lau, 2022, p. 142). Applied to human consciousness, an analogous "discriminator" "distinguishes between true perceptions of the world, memory, fantasy, and neuronal noise. For conscious perception of an object to occur, this discriminator must confirm that the early sensory information represents the object. This model, Lau asserts, accounts for sensory richness, because higher-order representations access richer, lower-level perceptions of first-order representations (Stirrups, 2023). Bottom line, Lau strikes the ambitious claim that his theory explains the subjective "what-it-is-like-ness" of first-person experience—why it "*feels like something*" to be in a particular brain state, say with a sharp pain—mediated by higher-order representations in the brain (Lau, 2022, p. 197).

Enhancing his model, Lau proposes that "because of the way the mammalian sensory cortices are organized, perceptual signals in the brain are spatially 'analog' in a specific sense," which enables "computational advantages." Given this analog nature, "when a sensory representation becomes conscious, not only do we have the tendency to think that its content reflects the state of the world right now, also determined is *what it is like* to have the relevant experience—in terms of how subjectively similar it is with respect to all other possible experiences." Lau submits that this addresses the hard problem, "better than prominent alternative views" (Lau, 2022, p. 29).

9.8.5. LeDoux's higher-order theory of emotional consciousness

Neuroscientist Joseph LeDoux's Higher-Order Theory of Emotional Consciousness combines his approach to higher-order representationalism (9.8.3) and his commitment to the centrality of emotion. His thesis is that "the brain mechanisms that give rise to conscious emotional feelings are not fundamentally different from those that give rise to perceptual conscious experiences." Both, he proposes, "involve higher-order representations (HORs) of lower-order information by cortically based general networks of cognition" (GNC). The theory argues that GNC and "self-centered higher-order states are essential for emotional experiences" (Ledoux and Brown, 2017).

LeDoux challenges the traditional view that emotional states of consciousness (emotional feelings) are "innately programmed in subcortical areas of the brain," and are "as different from cognitive states of consciousness, such as those related to the perception of external stimuli." Rather, LeDoux argues that "conscious experiences, regardless of their content, arise from one system in the brain" and that "emotions are higher-order states instantiated in cortical circuits." In this view, all that differs in emotional and nonemotional states are "the kinds of inputs that are processed." According to LeDoux, "although subcortical circuits are not directly responsible for conscious feelings, they provide nonconscious inputs that coalesce with other kinds of neural signals in the cognitive assembly of conscious emotional experiences."

For understanding the emotional brain, LeDoux focuses on "fear," defining it as "the conscious feeling one has when in danger." In the presence of a threat, he says, "different circuits underlie the conscious feelings of fear and the behavioral responses and physiological responses that also occur." But it is the "experience of fear," the conscious emotional feeling of fear, that informs LeDoux's theory of consciousness, which he explains as follows. "A first-order representation of the threat enters into a higher-order representation, along with relevant long-term memories—including emotion schema—that are retrieved. This initial HOR involving the threat and the relevant memories occurs nonconsciously. Then, a HOROR [i.e., a third-order state, a HOR of a representation, a HOR of a HOR] allows for the conscious noetic experience of the stimulus as dangerous. However, to have the emotional autonoetic experience of fear, the self must be included in the HOROR" (Ledoux and Brown, 2017).

Advancing his theory, LeDoux explores "introspection," the term given by higher-order theorists to this third level of representations, that is, "to be aware of the higher-order state (to be conscious that you are in that state)." LeDoux proposes "a more inclusive view of introspection, in which the term indicates the process by which phenomenally experienced states result." Introspection, he says, "can involve either passive noticing (as, for example, in the case of consciously seeing a ripe strawberry on the counter) or active scrutinizing (as in the case of deliberate focused attention to our conscious experience of the ripe strawberry)." Both kinds of introspection lead to phenomenal experience, in LeDoux's view (Ledoux and Brown, 2017).

HOROR theory states that "phenomenal consciousness does not reflect a sensory state (as proposed by first-order theory) or the relation between a sensory state and a higher-order cognitive state of working memory (as proposed by traditional HOT). Instead, HOROR posits that phenomenal consciousness consists of having the appropriate HOR of lower-order information, where lower-order does not necessarily mean sensory, but instead refers to a prior higher-order state that is rerepresented." He says, "This second HOR is thought-like and, in virtue of this, instantiates the phenomenal, introspectively accessed experience of the external sensory stimulus. That is, to have a phenomenal experience is to be introspectively aware of a nonconscious HOR." He distinguishes ordinary introspective awareness, which is the passive kind of "noticing" that he postulates is responsible for phenomenal consciousness, "from the active scrutinizing of one's conscious experience that requires deliberate attentive focus on one's phenomenal consciousness." Active introspection, he stresses, "requires an additional layer of HOR (and thus a HOR of a HOROR)."

In studies of human patients, LeDoux and his PhD adviser, Michael Gazzaniga, "concluded that conscious experiences are the result of cognitive interpretation situations in an effort to help maintain a sense of mental unity in the face of the neural diversity of non-conscious behavioral control systems in our brain" (LeDoux, 2023b).

Rejecting the notion of the "self," and certainly mind-body dualism, LeDoux positions "consciousness" as the fourth and final "realm of existence" for animal life, the four realms being "bodily, neural, cognitive, and conscious." LeDoux replaces the self with an "ensemble of being"

that "subsumes our entire human existence, both as individuals and as a species" (LeDoux, 2023a).

LeDoux's views continue to develop. In particular, he picks out two overarching perspectives. First, his *multi-state hierarchical model of consciousness*, which features an intricate anatomical framework evincing the complexity of higher-order processing via redundancy. The multi-state hierarchical model of consciousness, he says, "replaces the traditional volley between the sensory cortex and the lateral PFC [prefrontal cortex] with a more complex anatomical arrangement consisting of a hierarchy of structures, each of which creates different kinds of states that are re-represented/re-described by circuits of sub-granular and granular PFC and that contribute to higher-order mental modeling and conscious experience. The states that constitute the functional features of the multi-state hierarchical higher-order theory of consciousness, and the brain areas that are associated with these states, include primary lower-order states (areas of the sensory cortex); secondary lower-order states (memory areas and other convergence zones in the temporal and parietal lobes); sub-higher-order states (meso-cortical areas of sub-granular PFC, including the anterior cingulate, orbital, ventromedial, prelimbic, and insula PFC); and higher-order states that re-represent/re-describe/index the various other states to construct mental models in working memory (granular PFC)" (LeDoux, 2023a, p. 234).

LeDoux's second overarching perspective is the *dual mental hypothesis* that shows the interplay between preconscious and conscious states and the role of narratives in driving them. In the dual mental-model hypothesis, he says, "explicit consciousness of complex events emerges from interactions between granular and sub-granular PFC states. Lower-order non-PFC states, while often involved as inputs to the PFC, are not necessary for such higher-order conscious experiences. In other words, a thought, which is a higher-order state constructed by a pre-conscious mental model, is sufficient to populate the conscious higher-order state via the second mental model." The output of the conscious mental model, he says, "much like the output of the pre-conscious mental model, is an abstract mentalese narrative (albeit a conscious one) that feeds distributaries flowing to motor circuits that control overt behavior and verbal expression." LeDoux senses that "this implies that we have conscious agency, which you may know of as free will"—adding, "the question of whether we actually make conscious choices is a matter of debate" (LeDoux, 2023a, pp. 296–297).

9.8.6. *Humphrey's mental representations and brain attractors*

Neuropsychologist Nicholas Humphrey employs an evolutionary framework, combining mental representations with what he calls "attractor states in the brain," to develop a novel materialistic theory of phenomenal consciousness, which he sees as a late and not ubiquitous evolutionary development. His multi-discipline argument follows (Section: Humphrey, 2023a,b, 2022, 2024; Humphrey, 2023a,b).

Sensations, he says, are ideas we generate: mental representations of stimuli arriving at our sense organs and how they affect us. Their properties are to be explained, therefore, not literally as the properties of brain-states, but rather as the properties of mind-states dreamed up by the brain. Remarkably, we (and presumably other sentient creatures) represent what's happening as having "phenomenal properties", or "qualia", that fill the "thick time" of the subjective present. The result is we come to have a psychologically impressive sense of self—a "phenomenal self" that is semi-independent of our physical bodies. This idea of "what it's like to be me" may be in some respects "fake news"; but Humphrey's point is that, to us as the subjects, it's big news!

When it comes to how sensations are generated in the brain, Humphrey points out this has to be a two-stage process: first the gathering of sensory information, which is the sensory text, then the interpretation of this information, which is the conscious reading. This two-stage process generates our subjective take on what this is like for us. Phenomenal properties arise only at the interpretative stage. This, Humphrey stresses, is "a point often lost on researchers looking for the neural correlates of consciousness, who assume the properties of the brain activity must map onto the phenomenal properties of conscious experience." He calls the hard problem "the wrong problem" (Humphrey, 2022).

Humphrey believes that our best approach to explaining sentience (which is how he labels phenomenal consciousness) will be "forward engineering"—reconstructing the steps by which natural selection could have invented it. He proposes that sensations originated in primitive animals as evaluative responses to stimulation at the body surface. Thus, sensations started out as something the animal did about the stimulation rather than something it felt about it. Early on, however, animals hit on the trick of monitoring these responses—by means of an "efference copy" of the command signals—to yield a simple representation of what the stimulation is about. In short, a feeling (Humphrey, 2023a,b).

Humphrey's story quickens, as that feeling became privatised, resulting in activity in neural feedback loops, which became recursive and stretched out in time, taking on complex higher-order properties. It was then refined and stabilised to generate mathematically complex attractor states, which would give rise—"out of the blue"—to the apparently unaccountable qualities of sensory qualia. Quite possibly, he says, phenomenal experience involves the brain generating something like an internal text, which it interprets as being about phenomenal properties. The driving force behind these later developments was the adaptive benefits to the animal of the emergence of the phenomenal self.

This is why Humphrey takes phenomenal consciousness as a relatively late evolutionary invention, having evolved only in animal species that (a) have brains capable of entertaining and enjoying these fancy mental representations, and (b) lead lives in which having this bold sense of self can give them an edge in the fitness game. Thus, Humphrey challenges conventional wisdom that phenomenal consciousness in the animal kingdom is a gradient; his "hunch" is that only mammals and birds make the cut. Chimpanzees, dogs, parrots have it. Lobsters, lizards, frogs do not (Humphrey, 2023a,b).

9.8.7. *Metzinger's no-self representational theory of subjectivity*

Philosopher Thomas Metzinger presents a representationalist and functional analysis of subjectivity, the consciously experienced first-person perspective (Metzinger, 2004). What has been traditionally called "conscious thought," he argues, is actually "a subpersonal process, and only rarely a form of mental action. The paradigmatic, standard form of conscious thought is non-agentive, because it lacks veto-control and involves an unnoticed loss of epistemic agency and goal-directed causal self-determination at the level of mental content." Conceptually, Metzinger states, "conscious thought … must be described as an unintentional form of inner behaviour" (Metzinger, 2015).

A starting assumption is that phenomenal consciousness (subjective experience), "rather than being an epiphenomenon, has a causal role in the optimisation of certain human behaviours" (Frith and Metzinger, 2016). A leitmotif of Metzinger's models is that there are no such things as "selves"; selves do not exist in the world: "nobody ever had or was a self." All that exists, he argues, are "phenomenal selves, as they appear in conscious experience. The phenomenal self, however, is not a thing but an ongoing process; it is the content of a 'transparent self-model'" (Metzinger, 2004).

Metzinger employs empirical research to support his deflationary no-self model, showing how "we are not mentally autonomous subjects for about two thirds of our conscious lifetime, because while conscious cognition is unfolding, it often cannot be inhibited, suspended, or terminated." This means that "the instantiation of a stable first-person perspective as well as of certain necessary conditions of personhood turn out to be rare, graded, and dynamically variable properties of human beings" (Metzinger, 2015).

Drawing on a large psychometric study of meditators in 57 countries—more than 500 experiential reports—Metzinger focuses on "pure awareness" in meditation—the simplest form of experience there is—to illuminate, as he puts it, "the most fundamental aspects of how consciousness, the brain, and illusions of self all interact." Metzinger

explores "the increasingly non-egoic experiences of silence, wakefulness, and clarity, of bodiless body-experience, ego-dissolution, and nondual awareness" in order to assemble "what it would take to arrive at a minimal model explanation for conscious experience and create a genuine culture of consciousness" (Metzinger, 2024).

Metzinger uses an interdisciplinary, multi-layer analysis of phenomenological, representationalist, informational-computational, functional, and physical-neurobiological kinds of descriptions. His representationalist theory analyzes its target properties—those aspects of the domain to be explained. He seeks to make progress "by describing conscious systems as *representational* systems and conscious states as *representational* states" (Metzinger, 2000). He argues that "individual representational events only become part of a personal-level process by being functionally integrated into a specific form of transparent conscious self-representation, the 'epistemic agent model' (EAM)." The EAM, he suspects, "may be the true origin of our consciously experienced first-person perspective" (Metzinger, 2015).

Metzinger's resolution of the mind-body problem follows directly: our Cartesian intuitions that subjective experiences, phenomenal consciousness, "can never be reductively explained are themselves ultimately rooted in the deeper representational structure of our conscious minds" (Metzinger, 2004).

A corollary of Metzinger's work concerns individual behavior and collective culture, based on our perception of the experience of being an agent that causes events in the world and the belief that we "could have done otherwise" (the test of libertarian free will). This experience and belief enable us "to justify our behaviour to ourselves and to others and, in the longer term, create a cultural narrative about responsibility." Metzinger concludes that "conscious experience is necessary for optimizing flexible intrapersonal interactions and for the emergence of cumulative culture" (Frith and Metzinger, 2016).

9.8.8. *Jackson's diaphanous representationalism and the knowledge argument*

Philosopher Frank Jackson develops a representationalist view about perceptual experience. "That experience is diaphanousness (or transparent) is a thesis about the phenomenology of perceptual experience. It is the thesis that the properties that make an experience the kind of experience it is are properties of the object of experience." In other words, "accessing the nature of the experience itself is nothing other than accessing the properties of its object" (Jackson, 2007).

Jackson uses his Diaphanous Representationalism theory to undermine his own prior argument against materialism/physicalism based on the famous thought experiment of Mary the brilliant neurophysiologist who is forced to investigate the world from a black and white room via a black and white television monitor, and who acquires all the physical information there is to obtain about what goes on when we see colors. "What will happen when Mary is released from her black and white room or is given a color television monitor? Will she *learn* anything or not? It seems just obvious that she will learn something about the world and our visual experience of it. But then it is inescapable that her previous knowledge was incomplete. But she had *all* the physical information. *Ergo* there is more to have than that, and Physicalism is false" (Jackson, 1982).

Jackson argues that "although the diaphanousness thesis alone does not entail representationalism, the thesis supports an inference from a weaker to a stronger version of representationalism. On the weak version, perceptual experience is essentially representational. On the strong version, how an experience represents things as being exhausts its experiential nature." This means that there is nothing else needed to bring about phenomenal consciousness (qualia). Hence, according to Jackson, "strong representationalism undermines the claim that Mary learns new truths when she leaves the room"—which would defeat the defeater of materialism/physicalism (Jackson, 2007).

Philosopher Torin Alter disagrees, arguing that representationalism provides no basis for rejecting the knowledge argument, because even if representational character exhausts phenomenal character, "the physicalist must still face a representationalist version of the Mary challenge, which inherits the difficulty of the original" (Alter, 2003).

9.8.9. *Lycan's homuncular functionalism*

Philosopher William Lycan defends a materialist, representational theory of mind that he calls "homuncular functionalism" and which posits that "human beings are 'functionally organized information-processing systems' who have no non-physical parts or properties." Lycan does recognize "the subjective phenomenal qualities of mental states and events, and an important sense in which mind is 'over and above' mere chemical matter" (Lycan, 1987). But he defends materialism in general and functionalist theories of mind in particular by arguing for what he calls the "hegemony of representation," in that "there is no more to mind or consciousness than can be accounted for in terms of intentionality, functional organization, and in particular, second-order representation of one's own mental states" (Lycan, 1996).

Reviewing "an explosion of work" in consciousness studies by philosophers, psychologists, and neuroscientists, Lycan is "struck by an astonishing diversity of topics that have gone under the heading of "consciousness"—he lists more than 15, only six of which, he says, deal with "phenomenal experience," that is, qualia and the explanatory gap. From this he draws "two morals." First, he says, "no one should claim that problems of phenomenal experience have been solved by any purely cognitive or neuroscientific theory." (Here Lycan finds himself in "surprising agreement with Chalmers.") Second and perhaps more importantly, he says, some of "the theories cannot fairly be criticized for failing to illuminate problems of phenomenal experience"—because that is not what they intend to do, that is, "they may be theories of, say, awareness or of privileged access, not theories of qualia or of subjectivity or of 'what it's like'" (Lycan, 2004).

Lycan defends "the Representational theory of the qualitative features of apparent phenomenal objects: When you see a (real) ripe banana and there is a corresponding yellow patch in your visual field, the yellowness 'of' the patch is, like the banana itself, a representatum, an intentional object of the experience. The experience represents the banana and it represents the *yellowness of the banana*, and the latter yellowness is all the yellowness that is involved; there is no mental patch that is itself yellow. If you were only hallucinating a banana, the unreal banana would still be a representatum, but now an intentional inexistent; and so would be its yellowness. The yellowness would be as it is even though the banana were not real" (Lycan, 2004).

Lycan agrees that the "explanatory gap" is real. But this is for two reasons, he argues, "neither of which embarrasses materialism." First, he says, "phenomenal information and facts of 'what it's like' are ineffable. But one cannot explain what one cannot express in the first place. (The existence of ineffable facts is no embarrassment to science or to materialism, so long as they are fine-grained 'facts,' incorporating modes of presentation.)" Second, he says, "the Gap is not confined to consciousness in any sense or even to mind; there are many kinds of intrinsically perspectival (fine-grained) facts that cannot be explained" (without first conceding a pre-existing identity) (Lycan, 2004).

In their review, Thomas Polger and Owen Flanagan describe Lycan's view as, roughly, that "conscious beings are hierarchically composed intentional systems, whose representational powers are to be understood in terms of their biological function." They call the view "teleological functionalism" or "teleofunctionalism" and state "the homuncular part, for which Lycan and Daniel Dennett argued convincingly, is now so widely accepted that it fails to distinguish Lycan's view from other versions of functionalism. This, by itself, is a testament to the importance of Lycan's work" (Polger and Flanagan, 2001).

In his review, Frank Jackson explains that when Lycan argues "there is no special problem for physicalism raised by conscious experience," he is rightly distinguishing two questions. "Does consciousness per se raise a problem? And: Do qualia pose a special problem?" Lycan answers the first question on consciousness by defending an "inner sense account

of consciousness," holding that "consciousness is the functioning of internal attention mechanisms directed at lower-order psychological states and events." Jackson is less satisfied by Lycan's rejection of the knowledge argument, which Jackson calls "the most forceful way of raising the problem posed by qualia for physicalism." (Jackson says this "as someone who no longer accepts the argument") (Jackson, 1997).

According to Jackson, Lycan is confident that phenomenal nature is exhausted by functional role. In other words, "for Lycan, it is very hard for functional nature to fail to exhaust phenomenal nature. Almost anything you might cite as escaping the functional net is, by his lights, functional after all." Moreover, Lycan has "the nature of conscious experience exhausted by the intentional contents or representational nature of the relevant kinds of mental states" in that "the representational facts which make up a package [is] sufficient to capture in full the perceptual experience" (Jackson, 1997).

Lycan attacks neurobiological conventional wisdom in that "all too often we hear it suggested that advances in neuroscience will solve Thomas Nagel's and Frank Jackson's conceptual problem of "knowing what it's like." To Lycan, "this is grievously confused. For Nagel's and Jackson's claim is precisely that there is an irreducible kind of phenomenal knowledge that cannot be revealed by science of any kind. Nagel's and Jackson's respective 'Knowledge Arguments' for this radical thesis are purely philosophical; they contain no premises that depend on scientific fact." Lycan now presses his sharp point. "Either the arguments are unsound or they are sound. If they are unsound, then so far as has been shown, there is no such irreducible knowledge, and neither science nor anything else is needed to produce it. But if the arguments are sound, they show that no amount of science could possibly help to produce the special phenomenal knowledge. Either way, neither neuroscience nor any other science is pertinent."

Lycan seems sure that the "what it's like to be" and knowledge arguments are unsound and he can go about formulating his Representational theory of mind standing squarely in the materialist camp. (I am not so sure. It is my uncertainty that motivates this Landscape of Consciousness.)

9.8.10. *Transparency theory*

Transparency theory makes the argument that because sensory (e.g., visual) experience represents external objects and their apparent properties, experience has no other properties that pose problems for materialism. We "see right through" perceptual states to external objects and take no notice that we are actually in perceptual states; the properties we perceive in perception are attributed to the objects themselves, not to the perception (Lycan, 2019). If we look at a tree and try to turn our attention to the intrinsic features of our visual experience, the only features there to turn our attention to are features of the actual tree itself, including relational features of the tree from the perspective of the perceiver (Harman, 1990).

To make the argument, at a minimum, an additional premise is needed: If a perceptual state has mental properties over and above its representational properties, they must be "introspectible." But "not even the most determined introspection ever reveals any such additional properties." This is the transparency thesis proper (Lycan, 2019).

Philosopher Amy Kind cites experiential transparency as a major motivation driving representational theories of consciousness, which view phenomenal character as being reduced to intentional content. Assuming experience is transparent in that we "look right through" experience to the objects of that experience, "this is supposed to support the representationalist claim that there are no intrinsic aspects of our experience" (Kind, 2010).

Philosopher Michael Tye states that one important motivation for the theory that "phenomenal character is one and the same as representational content" is "the so-called 'transparency of experience.'" He addresses introspective awareness of experience and one problem case for transparency, that of blurry vision (Tye, 2002). A similar theory is "intentionalism," the view that the phenomenal character of experience supervenes on intentional content (Pace, 2007).

Philosopher Dirk Franken characterizes "the transparency of appearing" as follows: "The phenomenal quality of a particular state of appearing is fully exhausted by the sensible properties present to the subject of the state and their distribution over the respective field of appearance." Starting "from the assumption that the transparency of appearing is a purely phenomenological feature," Franken describes his "Transparency Thesis" with several propositions: "There are no other properties, next to the sensible properties, that have any bearing on the phenomenal quality of a state of appearing. The presentation of sensible properties is just all there is to the phenomenal quality of a state of appearing. No properties of the subject (insofar as it is the subject of this state) or of the state itself contribute to this phenomenal quality." He defends "surprising consequences" of the Transparency Thesis. First, "one has to give up the idea of the first-person-perspective as a kind of inner seeming or appearing directed onto mental states (at least, if the relevant states are states of appearing)." Next, two assumptions entailed in numerous popular accounts of phenomenal consciousness are negated: (i) "phenomenal qualities are properties of states of appearing that are independent or partly independent of the (sensible) properties presented in these states; " and (ii) "there can be phenomenally conscious states of appearing even though there is nothing that is presented to their subjects" (Franken, n.d.).

9.8.11. *Tye's contingentism*

Philosopher Michael Tye proposes a theory of consciousness he calls "contingentism," which is a kind of identity theory (i.e., phenomenal states and physical/brain states are literally the same) but with a novel twist: while the identity is indeed true in our world, it is not metaphysically true in all possible worlds. "Scenarios in which the relevant physical processing is present and consciousness is missing are easily imaginable (and thus metaphysically possible), but this is irrelevant if it is only a contingent fact that consciousness is a physical phenomenon" (Tye, 2023).[32]

Contingentism, Tye states, "finds its origins in the views of Feigl, Place and Smart in the 1950s and 1960s. These philosophers held that sensations are contingently identical with brain processes, where sensations are understood to be conscious states such as pain or the visual experience of red." The identity here was taken to be contingent, in part, because "it was taken to be clear that scientific type-type identities generally are contingent." Smart's example was that he could imagine that lightning is not an electrical discharge. (These claims are mistaken, Tye says; "If in actual fact lightning is an electrical discharge, it could not have been otherwise.") (Tye, 2023).

Tye says, "the contingentist about consciousness agrees with the above remarks concerning lightning and is happy to extend them to many other scientific identity statements. But the contingentist holds that the case of conscious mental states—states such that there is something it is *like* to undergo them—is different. Here the claim is not that such states are contingently identical with brain processes, but that such states are contingently identical with physical states of some sort or other, where the notion of a physical state is to be understood broadly to include not only neurophysiological states but also other states that are grounded in microphysical states, including functional states or states of the sort posited by representationalism, for example. For conscious states, the identities are contingent since we can easily imagine their having not obtained. For example, we can easily imagine a zombie undergoing the physical state with which the experience of fear is to be identified and yet not experiencing fear at all. Similarly, we can easily imagine someone experiencing fear without undergoing the given physical state" (Tye, 2023).

[32] Tye notes that "contrary to orthodoxy, there is no obvious difficulty with holding that identity statements in which the identity sign is flanked by rigid designators are sometimes contingent" (Tye, 2023).

The solution, Tye suggests, "lies with the realization that it is a mistake to model the consciousness case on that of physical-physical relationships. Qualitative character Q is identical with physical property R, if physicalism is true. But this is a contingent identity (even though the designators 'Q' and 'R' are rigid). So, we can imagine Q without R (and R without Q), but the fact that we can do so is not an indicator of an explanatory gap. A creature could indeed have been in a state having Q without being in a state having R and vice-versa" (Tye, 2023).

Might things have been different in the actual world? Indeed, they might, Tye says. "The physical processing might have gone on just as it does, the information processing might have been just the same, the cognitive machinery might have functioned as it does, and yet along with all of this, Q might not have been present in experience. That is certainly intelligible to us. But it creates no explanatory puzzle; for that is only a metaphysically possible world. It is not the actual world. As far as the actual world goes, there is nothing puzzling or problematic, nothing left to explain … No mystery remains" (Tye, 2023).

This is because "in the actual world," consciousness is physical, according to the physicalist, "since it is only on the hypothesis of physicalism with respect to the actual world that problems of emergence and causal efficacy can be handled satisfactorily, or so the physicalist believes."

Thus, Tye concludes, "once we become contingentists, the hard problem has a straightforward and satisfying solution."

In support of his views, Tye turns to "vagueness" in assessing consciousness in the hierarchical taxonomy of life and in the process of evolution (Tye, 2021). According to Tye, "The two dominant theories of consciousness argue it appeared in living beings either suddenly, or gradually. Both theories face problems. The solution is the realization that a foundational consciousness was always here, yet varying conscious states were not, and appeared gradually." Given that it is hardly obvious how to discern which organisms are conscious, and, if so, their kind or level of consciousness, borderline cases of consciousness can make no sense. As David Papineau reviews Tye, "But this isn't because a sharp line is found somewhere as we move from non-conscious physical systems to conscious ones. Rather [according to Tye] it's because no such line exists at all. Even the most basic constituents of physical reality are already endowed with consciousness" (Papineau, 2022). Thus, Tye transitions from his traditional physicalism to a form of panpsychism, though differing from those of mainstream panpsychists (13).[33]

In admirable full disclosure, Tye states that his contingentism "is written from the perspective of the reductive physicalist (understood broadly to include functionalists and representationalists)," and that he believes contingentism presents "the best hope for a defense of reductive physicalism." However, he adds, "I myself am no longer a thoroughgoing reductive physicalist. I now believe that there is an element in our consciousness that cannot be captured via higher level reductions" (Tye, 2023).

In addition, Tye suggests that, from the representationalist perspective and supporting its views, "history matters crucially to phenomenology. What it is like for an individual at a given time is fixed not just by what is going on in the individual at that time but also by what was going on in the individual in the past. Two individuals can be exactly alike intrinsically at a time and yet differ in the phenomenal character of their mental life at that time" (Tye, 2019).

Tye concludes that "once we think of experiences in a representationalist and broadly reductionist way," we can better appreciate phenomenology, including its presence or absence, such as in thought experiments where "a person slowly acquires a silicon chip brain" (see Virtual Immortality, 25).

9.8.12. *Thagard's neural representation, binding, coherence, competition*

Philosopher Paul Thagard poses big questions upfront. "Why do people have conscious experiences that include perceptions such as seeing, sensations such as pain, emotions such as joy, and abstract thoughts such as self-reflection? Why is consciousness central to so much of human life, including dreams, laughter, music, religion, sports, morality, and romance? Are such experiences also possessed by other animals, plants, and robots?" (Thagard, 2024).

Thagard's theory of consciousness "attributes conscious experiences to interactions of four brain mechanisms: neural representation, binding, coherence, and competition." It distinguishes itself from current theories in several respects, he says. "The four brain mechanisms described are empirically plausible and clearly stated. Conscious experiences emerge from their interactions in areas across the brain." The mechanisms, he argues, "explain not only ordinary perceptual experiences such as vision, but also the most complex kinds of conscious experience including self-valuation, dreams, humor, and religious awe." Moreover, he adds, "A crucial but often neglected aspect of consciousness is timing, but the four mechanisms fit perfectly with recent neuroscientific findings about how time cells enable brains to track experiences" (Thagard, 2024).

Thagard's founds his theory on strict, empirically based neuroscience. His way of thinking is exemplified by his "Attribution Procedure," an eight-step process for using what he calls "explanatory coherence" as a touchstone to establish "whether or not an animal or machine has a mental state, property, or process." (Thagard, 2021, pp. 13–14). For example, he offers twelve features of intelligence (i.e., problem solving, learning, understanding, reasoning, perceiving, planning, deciding, abstracting, creating, feeling, acting, communicating) and eight mechanisms to explain these features (i.e., images, concepts, rules, analogies, emotions, language, intentional action, consciousness). "All eight of these mental mechanisms can be carried out by a common set of neural mechanisms, many of which have been modeled computationally." This account of twelve features and eight mechanisms, Thagard says, "yields a twenty-item checklist for assessing intelligence in bots and beasts." A similar way of thinking he applies to consciousness, stating that consciousness results from competition among neural representations (Thagard, 2021, pp. 3–4, 50, 49).

Claiming that his theory of consciousness possesses "the accuracy and breadth of application to mark a solid advance in the grand task of explaining how and why consciousness is so central to human life," Thagard highlights an empirically supported explanation of consciousness resulting from the four brain mechanisms (i.e., neural representation, binding, coherence, and competition); application to a broad range of conscious experiences including smell, hunger, loneliness, self-awareness, religious experience, sports performance, and romantic chemistry; use of these four brain mechanisms to generate novel theories of dreaming, humor, and musical experience; a new theory of time consciousness; assessment of consciousness in non-human animals and machines, including the new generative AI models such as ChatGPT (Thagard, 2024).

Working together, these four brain mechanisms, Thagard says, "explain the full range of consciousness in humans and other animals, and show why plants, bacteria, and ordinary things lack consciousness." No current computers are conscious, he asserts, using a checklist of features and mechanisms of consciousness, "but the new generative models in artificial intelligence have similar mechanisms to humans that might enable some degree of consciousness." He concludes with high physicalist confidence: "Consciousness does not need to be a mystery once we understand how brains build it" (Thagard, 2024).

9.8.13. *T. Clark's content hypothesis*

Philosopher Thomas Clark posits phenomenal consciousness as the representational *content* of a cognitive system's sufficiently structured

[33] To speak of "mainstream panpsychists"—when I was doing neurophysiology (mid 1960s, UCLA Brain Research Institute)—would have seemed an oxymoron.

representational processing (Clark, T., 2019). Conscious experience exists only for the conscious system, so is categorically subjective, and its basic elements are irreducibly qualitative. As a general rule, he says, we don't find representational content in the world it participates in representing, which can help explain subjectivity. Moreover, following Metzinger's concept of an "untranscendable object," a representational system must have epistemic primitives that resist further representation on pain of a metabolically expensive representational regress. This can help explain the non-decomposable, monadic character of basic sensory qualities such as red, sweet, pain, etc. Developments in the science of representation and representational content, he says, may (or may not) vindicate the Content Hypothesis. Clark says that his model is consistent with Integrated Information Theory, Global Workspace Theory, and Predictive Processing, all of which involve representation (Clark, T., 2019, 2024).

Clark, a proponent of naturalism as a worldview (Clark, T., 2007), believes that a materialist can see that "consciousness, as a strictly physical phenomenon instantiated by the brain, creates a world subjectively immune to its own disappearance … it is the very finitude of a self-reflective cognitive system that bars it from witnessing its own beginning or ending, and hence prevents there being, *for it*, any condition other than existing" (Clark, T., 1994). While this sounds odd, almost an oxymoron, Clark develops the idea of "generic subjective continuity" based on a thought experiment inspired by the work of philosopher Derek Parfit. Clark argues in that at death we shouldn't anticipate the onset of nothingness or oblivion—a common secular intuition—but rather the continuation of experience, just not in the context of the person who dies. The end of one's own consciousness, he offers, "is only an event, and its non-existence a current fact, from other perspectives." After death we won't experience non-being, he says, we won't 'fade to black'. Rather, as conscious being we continue "as the generic subjectivity that always finds itself here, in the various contexts of awareness that the physical universe manages to create" (Clark, T., 1994).

9.8.14. Deacon's symbolic communication (human consciousness)

Neuroanthropologist Terrence Deacon asserts that symbolic communication has radically altered the nature of human consciousness, whereas consciousness broadly is coextensive with the development of brains in animals that regulate their movement with the aid of long-distance senses, such as vision, because of the predictive capacity this affords and requires. However, symbolic communication has given humans the capacity of being conscious of a virtual realm that has become untethered from physical contiguity and immediacy (Deacon, 1998, 2024).[34]

Moreover, by virtue of the way that symbolic communication allows us indirect access to others' thoughts and experiences, we have become a symbolically eusocial species that derives our personal identities and ability to think from a physically and temporally extended shared mentality. Some, he says, have referred to this structure as "Extended Mind."

Deacon sees this symbolic mode of cognition as enabling the emergence of novel kinds of remembering and unprecedented forms of emotional experience, as well as unprecedented forms of value, such as ethical norms and aesthetic sense. This is also, he says, the source of our feeling of incompleteness and need to find Meaning.

[34] Note that Terrence Deacon has *two* theories of consciousness on the Landscape: "Self-Organized Constraint and Emergence of Self" earlier (9.5.8) and "Symbolic Communication" here. This is not an error; nor does it imply that the two cannot be woven together. Rather, it recognizes that, at this time, the two are sufficiently different, and sufficiently interesting, to warrant their separate locations.

9.9. Language relationships

Language Relationships discern connections, causal and other, between consciousness and language. Language obviously enriches the content of consciousness, perhaps provides a framework for human consciousness, but is there a deeper relationship? Does consciousness *require* language, in that if there is no language capability there can be no inner experience? Conversely, does language *require* consciousness, in that if there is no inner experience, there can be no language capability? (Note that while language does not generate theories of consciousness per se, it features in some and is rejected in others, both of which are worth exploring.)

Much depends on careful definitions. To take the consciousness-requires-language causal paradigm, if by consciousness we mean phenomenal consciousness, raw inner experience only, then if we claim that language is required, then our claim would limit phenomenal consciousness, inner experience, to human beings and would exclude all (or at least almost all) other animals. Argue this to a happy dog owner and you will confront an angry dog owner.

To take the language-requires-consciousness causal paradigm, with a definition of language sufficiently loose to subsume computer languages or communications between paramecia or signals between embryonic stem cells, consciousness would not be required.

The philosophical debate regarding whether language is necessary for consciousness has a long and meandering history. Many argue that consciousness does not at all require language; others, that consciousness is facilitated by language or even is not possible without it. A contemporary consensus is building around the idea that increasing levels of consciousness, ranging from unconsciousness to highly conscious reflective self-awareness, requires increasing use of language. What follows would be that language is not needed for pure phenomenal consciousness, a general state of awareness, or in responding to external stimuli—such as in preverbal infants—but phenomenal consciousness would be needed for complex expressions of consciousness, like self-awareness, information integration, and metaconsciousness, which are based on language-powered capacities, especially inner speech (Ivory Research, 2019).

Because we sense that many animal species are conscious—much like we assume that other humans are conscious like we are conscious—and we know that language is much more restricted, to humans and, in a lesser sense, some other animals (e.g., primates, cetaceans, birds), this would seem to weaken the consciousness-language nexus. Moreover, language seems to be a much more recent evolutionary emergent than consciousness (Berwick and Chomsky, 2016).

Philosopher Rebecca Goldstein maintains that language does not exhaust all that there is in consciousness. She calls as evidence infants prior to or in the early stages of acquiring language, where "it's clear how much consciousness goes on before there is language" (Goldstein, 2014).

Neuroscientist Colin Blakemore sees an intimate relationship between the structure of language and the high-level aspects of consciousness, especially consciousness of self, the consciousness of intention—"the concept that I am the helmsman of myself, carrying myself around the world, making decisions." He calls the grammatical forms of language "intentional in their style" and argues that our conscious representation of self is a meta-representation of what's really doing the work down below, and that the reason "our brains go to the trouble of building this false representation of how we really are is to implement and to support language" (Blakemore, 2012a).

Blakemore speculates that we don't come pre-programmed to be conscious; that we learn to be conscious and our consciousness develops and changes over time. Recognizing that the term "consciousness" can refer to diverse forms of subjectivity, and that even a newborn baby has "a kind of brute awareness of the world, sensory experiences," he suggests that the nature of subjectivity grows through individual experience and that the complexities of the internal representation of the self is

mediated by language.

Experimental psychologist Jeremy Skipper hypothesizes that language, with an emphasis on inner speech, generates and sustains self-awareness, that is, higher-order consciousness. He develops a "HOLISTIC" model of neurobiology of language, inner speech, and consciousness. It involves a "core" set of inner speech production regions that take on affective qualities, involving a largely unconscious dynamic "periphery," distributed throughout the whole brain. He claims that the "model constitutes a more parsimonious and complete account of the neural correlates of consciousness'" (at least of self-consciousness) (Skipper, 2022).

Ned Block points to a related distinction between consciousness and cognition. Cognition doesn't have to be linguistic, he says, because non-linguistic animals have some cognition. But then there are animals that seem to have little or no cognition, just perception. Block concludes, "We can see consciousness at its purest in perceptual consciousness, and it has nothing to do, or little to do, with language" (Block, 2014).

While the overwhelming contemporary consensus is that consciousness does not require language, human consciousness is obviously and fundamentally affected or even framed by language. We explore several approaches to the consciousness-language nexus.

9.9.1. *Chomsky's language and consciousness*

Philosopher and linguist Noam Chomsky revolutionized the theory of language, and although language-related theory of consciousness has not been a focus of his contributions, its relevance remains. Chomsky famously posited linguistic capacity, especially syntactic knowledge, as at least partially innate and mostly (if not entirely) unique to human beings. Thus, language acquisition in all human children is somewhat instinctual and surprisingly rapid, conditioned by language-specific features of diverse languages. Chomsky labels this core set of inherited grammatical rules "universal grammar" and characterizes these inborn, subconscious capabilities as "deep structure".

Does Chomsky's universal grammar with its deep structure carry implications for consciousness? How does Chomsky approach the hard problem of phenomenal consciousness? His views are complex, not easily categorized (Section: Chomsky, 2022a, 2022b; Feser, 2010, 2022b).

Chomsky is an aggressive critic of behaviorism—it makes no sense, he says, to study internal phenomena by observing external manifestations. The study of language is entirely inconsistent with behaviorist principles. "Nothing there," he says. To understand it, one must examine internal processes. Thus, the connection between the deep structure of language and the essence of consciousness.

Chomsky is also a critic of the hard problem, labeling it a "pseudo-problem." Some questions, by their simple structures, are not real questions, he says, in that there is no logical way to answer them. His example question "Why do things happen?" cannot be answered in the general, while a similar-sounding question, say, "Why did this earthquake happen?" can be answered in the specific. Chomsky believes that the hard problem of consciousness is an example of the former and therefore is not a genuine question (while the "easy" problems of consciousness, discovering neural correlates, are examples of the latter).

Exemplifying Chomsky's unorthodox approach to consciousness, even though he commits to a materialism/physicalism ontology that the mind is generated only in the brain, rather than deflating the ontological status of the mental, his contrarian position is to challenge the ontological status of the physical—arguing that science does not know what matter really is. To Chomsky, matter, not mental, is the main mystery.

As Chomsky says, "The mind-body problem can be posed sensibly only insofar as we have a definite conception of body. If we have no such definite and fixed conception, we cannot ask whether some phenomena fall beyond its range" (Chomsky, 1987). Moreover, "The mind-body problem can therefore not even be formulated. The problem cannot be solved, because there is no clear way to state it. Unless someone proposes a definite concept of body, we cannot ask whether some phenomena exceed its bounds."

As for clarifying the concept of the body, the physical, matter, Chomsky states, "the material world is whatever we discover it to be, with whatever properties it must be assumed to have for the purposes of explanatory theory. Any intelligible theory that offers genuine explanations and that can be assimilated to the core notions of physics becomes part of the theory of the material world, part of our account of body."

To Chomsky, a mechanical model of the world, developed in early modern philosophy and inchoate science, could never account for aspects of the mental. Thus, while he understands Descartes' motivation to postulate a separate, nonphysical "thinking substance," he rejects Descartes' classic dualism and trains his analytic guns on the mechanical model in particular and on matter in general.

Chomsky feels no pressure to devise his own theory of consciousness. If anything, he shuns grand solutions. "There seems to be no coherent doctrine of materialism and metaphysical naturalism, no issue of eliminativism, no mind-body problem (Chomsky, 2020). In short, as Edward Feser notes, "if the problem has no clear content, neither do any of the solutions to it" (Feser, 2022b). Chomsky is content to allow science to do its work, advancing knowledge of the brain and of the mind, leaving to the future the construction of proper theories of consciousness irrespective of current notions of the physical and matter.

One may infer that Chomsky contemplates an expanded view of the physical, with matter having features now unknown, which then would "naturally" subsume the mental. (Note: Chomsky rejects panpsychism.) However, in an overarching sense, he remains unsure whether human beings have the capacity to solve what he believes are genuine mysteries about the nature of reality, but he is also unsure whether consciousness will prove to be an ultimate mystery.

9.9.2. *Searle's language and consciousness*

To philosopher John Searle, language is crucial for consciousness, just as consciousness is crucial for language, because much of our consciousness is shaped by language and because the parts of language that are most important to us are precisely those that are conscious (Searle, 2014b).

Searle contrasts human and animal consciousness: "My dogs have a kind of consciousness which is incredibly rich. They can smell things I can't smell and they have a kind of inner life that I don't have, but all the same, there are all kinds of conscious experiences they simply cannot have. My doggy lying there may be thinking about chasing other dogs but he's not thinking about doing his income tax or writing his next poem or figuring out how he's going to have a better summer vacation next year."

Searle stresses how language gives us enormous power in shaping consciousness. A favorite quotation is from the French philosopher La Rochefoucauld: "Very few people would ever fall in love if they never read about it." Searle's point is that language shapes experience; there are all kinds of experiences you just can't have without language.

As for how language and consciousness articulate and developed over time, Searle envisions an evolutionary "boot-strapping effect." It starts off with pre-linguistic consciousness, and then develops linguistic meaning and communication, which enrich consciousness. The result is an elaborate structure of language, which makes for a more elaborate structure of consciousness, which then enables you to enrich your language. There is a continuous reinforcing and compound effect (Searle, 2014b).

Non-linguistic animals can't do this, Searle continues: "My doggie can think somebody is at the door, but he cannot think I wish 17 people were at the door, or I hope we get more people at the door next week. Because to do that, he has got to be able to shuffle the symbols in a way that human beings can with their inner syntax."

Although animals do not form or express their beliefs in a symbolic language, Searle attributes to them intentional states, and because intentional states require consciousness, it follows that consciousness

does not require symbolic language. He cites as evidence that animals "correct their beliefs all the time on the basis of their perceptions" (Searle, 2002; Proust, 2003).

9.9.3. Koch's consciousness does not depend on language

Neuroscientist Christof Koch asserts without ambiguity, "consciousness doesn't depend on language," and he offers vivid clinical cases of brain trauma or insult where language is obviously lost and consciousness is obviously retained. Koch is especially exercised by the claim that "only humans experience anything," that other animals have no sentience, a belief he calls "preposterous, a remnant of an atavistic desire to be the one species of singular importance to the universe at large. Far more reasonable and compatible with all known facts is the assumption that we share the experience of life with all mammals" (Koch, 2019).

Koch recounts and rejects how "Many classical scholars assign to language the role of kingmaker when it comes to consciousness. That is, language use is thought to either directly enable consciousness or to be one of the signature behaviors associated with consciousness." He concludes, "language contributes massively to the way we experience the world, in particular to our sense of the self as our narrative center in the past and present. But our basic experience of the world does not depend on it" (Koch, 2019).

9.9.4. Smith's language as classifier of consciousness

Philosopher Barry Smith states that while we think of consciousness as "moments of experience," the way we capture what's similar or different in our experiences over time is via language. The "passing show," he says, "gets assembled into larger, more meaningful groups when we use language to classify and categorize." How do we do this? How do we connect up these bits of consciousness with something stable? How do we classify the world, not just our own experience, and communicable between experiencers? The answer is language, he says, which he calls a species-specific property of human beings. With language, we codify our own experience, represent the content of our own minds, and compare it with the contents of other minds (Smith, 2012).

Distinguishing consciousness from language, Smith tells of someone who lost all of their words for fruit and vegetables, and only those words. They could use language normally and they had conscious awareness of fruits and vegetables, but they could not use, pronounce or even recognize words for fruit and vegetables. "It's as if a whole shelf of meanings had been taken away."

Smith relates grades of consciousness to grades of language. One can lose the word for an object but can still recognize the object (a form of aphasia). Deeper, one can not only lose the word as a piece of sound representing an object, but also not recognize the object either and lose the whole meaning (a form of agnosia). He describes stroke patients who, for example, can't use the word "glove". "What is that?" "Can't say." Perhaps just the word is missing, because if they are asked, "Is there a glove on the table?", they answer, "Yes." But other stroke patients answer, "I've no idea." And if you show them a glove and ask, "What's this for?", they say, "I don't know, maybe it's for keeping coins."

Smith suggests that words are ways that our visual consciousness categorizes and structures the world. And perhaps a deeper loss of language can lead to a dissolution of the very categories that we use to classify our perceptual experiences. So, it's not just that I can't name or categorize some object, but without language the actual conscious experience of that object is radically different. If so, language is responsible, at least in part, for organizing consciousness (Smith, 2012).

9.9.5. Jaynes's breakdown of the bicameral mind

Psychohistorian Julian Jaynes's 1976 book, *The Origin of Consciousness in the Breakdown of the Bicameral Mind*, proposes that consciousness, particularly "the ability to introspect," is a learned behavior rooted in language and culture and arises from metaphor; consciousness is neither innate nor fundamental. To Jaynes, language plays a central role in consciousness; language is "an organ of perception, not simply a means of communication" (Jaynes, 1976; Bicameral Mind, 2024).

Jaynes defines consciousness idiosyncratically by distinguishing it from sensory awareness and cognition; as such it more closely resembles "introspective consciousness," as he calls it, than it does phenomenal consciousness, which is the target of this Landscape. Nonetheless, it is helpful to work through Jaynes's definitions and arguments, clarifying how to avoid what could be confounding or muddled thinking about consciousness. While Jaynes's consciousness is not phenomenal consciousness, his careful parsing of his definition gives insight into the subtleties of the parsing process. Moreover, appreciating the flow of Jaynes's arguments as well as the substance of his claims sharpens our view of the entire Landscape.

In Jaynes's words, "Consciousness is not a simple matter and it should not be spoken of as if it were." He starts with what his consciousness is not. (i) Not the "many things that the nervous system does automatically for us. All the variety of perceptual constancies … all done without any help from introspective consciousness." (ii) Not what he calls "preoptive" activities, such as how we sit, walk, move. "All these are done without consciousness, unless we decide to be conscious of them." (iii) Not even speaking, where "the role of consciousness is more interpolative than any constant companion to my words." Consciousness, he stresses, is not sense perception; it does not copy experience; it is not necessary for learning; it is not even necessary for thinking or reasoning; and it has only an arbitrary and functional location (Jaynes, 1987).

To Jaynes, consciousness, or what he refines as "subjective conscious mind," is an analog of the real world. "It is built up with a vocabulary or lexical field whose terms are all metaphors or analogs of behavior in the physical world … It allows us to short-cut behavioral processes and arrive at more adequate decisions. Like mathematics, it is an operator rather than a thing or a repository. And it is intimately bound with volition and decision … Every word we use to refer to mental events is a metaphor or analog of something in the behavioral world" (Jaynes, 1987).

Jaynes says that the primary feature of his consciousness is an "associated spatial quality that, as a result of the language used to describe such psychological events, becomes, with constant repetition, this spatial quality of our consciousness or *mind-space* …. It is the space which you preoptively are introspecting on at this very moment."

The second most important feature of Jaynes' consciousness is the subject of the introspecting, the *introspective "I"*. Here Jaynes uses analogy, which differs from metaphor in that the similarity is between relationships rather than between things or actions. "As the body with its sense organs (referred to as I) is to physical seeing," he says, "so there develops automatically an analog 'I' to relate to this mental kind of 'seeing' in mind-space."

A third feature of Jaynes' consciousness is *narratization*, "the analogic simulation of actual behavior." Consciousness, he says, "is constantly fitting things into a story, putting a before and an after around any event." Other features of Jaynes' consciousness include: "*concentration*, the 'inner' analog of external perceptual attention; *suppression*, by which we stop being conscious of annoying thoughts, the analog of turning away from annoyances in the physical world; *excerption*, the analog of how we sense only one aspect of a thing at a time; and *consilience*, the analog of perceptual assimilation." Jaynes "essential rule" is that "no operation goes on in consciousness that was not in behavior first. All of these are learned analogs of external behavior" (Jaynes, 1987).

Definition in hand, Jaynes asks, "When did all this 'inner' world begin?", which he calls "the most important watershed in our discussion."

Jaynes famously introduces the hypothesis of the "bicameral mind", a non-conscious mentality supposedly prevalent in early humans that featured a kind of auditory hallucinations. He argued that relatively

recent human ancestors as late as the ancient Greeks did not consider emotions and desires as stemming from their own minds but rather as the actions of external gods (Bicameral mentality, 2024).

Jaynes takes the oldest parts of the Iliad and asks, "Is there evidence of consciousness?" The answer, he thinks, is no. "People are not sitting down and making decisions. No one is. No one is introspecting. No one is even reminiscing. It is a very different kind of world" (Jaynes, 1987).

Who, then, makes the decisions? Whenever a significant choice is to be made, Jaynes suggests that "a voice comes in telling people what to do. These voices are always and immediately obeyed. These voices are called gods." To Jaynes, this is the origin of gods. He regards them as "auditory hallucinations" similar to, although not the same as, "the voices heard by Joan of Arc or William Blake. Or similar to the voices that modern schizophrenics hear."

Jaynes coins the "bicameral mind" using the metaphor of a bicameral legislature. It simply means that human mentality at this time was in two parts, a decision-making part and a follower part, and neither part was conscious in the sense in which Jaynes has described it (above) (Jaynes, 1987).

The theory posits that the human mind once operated in a state in which cognitive functions were divided between one part of the brain which appears to be "speaking", and a second part which listens and obeys—the bicameral mind—and that the breakdown of this division gave rise to consciousness in humans.

Jaynes supports his theory with historical texts and archaeological evidence. He places the origin of consciousness around the 2nd millennium BCE and suggests that the transition from the bicameral mind to consciousness was triggered by the breakdown of the bicameral system of society (Bicameral mentality, 2024).

Jaynes describes bicameral societies as "strict and stable hierarchies," including bicameral theocracies, where "everything went like clockwork providing there was no real catastrophe or problem." But such a system is precarious, especially as society grows in population and complexity, such that "given a time of social and political instability, bicamerality can break down like a house of cards." Whereas all significant decisions previously had been based on the bicameral mind, after its breakdown, after the hallucinated voices no longer told people what to do, a new way of making decisions had to develop, which was a kind of proto-consciousness (Jaynes, 1987).

There is an obvious, perhaps tempting, neurobiological correlate: the two cerebral hemispheres, especially based on the pioneering split-brain research of Michael Gazzaniga and Roger Sperry, which explained functional brain lateralization and how the cerebral hemispheres communicate with each another. Jaynes puts it simply: "the right hemisphere was 'talking' to the left, and this was the bicameral mind" (Jaynes, 1987).

Although Jaynes's physicalist, deflationary theory of consciousness continues to intrigue, it is not accepted by consciousness experts. Nevertheless, Jaynes's ideas and arguments can inform our view of the Landscape.

9.9.6. *Parrington's language and tool-driven consciousness*

Biologist John Parrington proposes that a qualitative leap in consciousness—"human self-conscious awareness"—occurred during human evolution as "our capacity for language and our ability to continually transform the world around us by designing and using tools" transformed our brains. His challenge is to distinguish human language and use of tools from analogous activities of animals, particularly other primates, as contemporary research uncovers more complex animal capacities (Parrington, 2023).

Regarding language, Parrington stresses the "highly distinctive feature of human language" as "an interconnected system of abstract symbols, linked together by grammar." This is why, he says, "only human beings are able to use language to convey complex ideas like past, present and future, individual versus society, location in space and even more abstract concepts." (Parrington, 2023, p. 22). He defends his view of human consciousness as language-dependent by stressing our capacity for "inner speech, or more generally inner symbols, as central to human thought" (Parrington, 2023, p. 55).

Regarding use of tools, Parrington argues that "tool use by other species tends to be both occasional and also very limited in the type of tools that are created. In contrast, a unique feature of our species is that practically all of our interactions with the world are through tools that we have created." Moreover, "we are continually in a process of inventing new types of tools and technologies" (Parrington, 2023, p. 19).

Parrington's theory focuses on human brains, which are "not just much bigger than those of other primates, but radically different in structure and function" (a claim that hangs on "radically") (Parrington, 2023, p. 20). He references different brain regions, highlighting the cerebellum, long thought limited to coordinating repetitive movements but now shown to play a role in human creativity and imagination (Parrington, 2023, p. 47), and the prefrontal cortex, greatly expanded in humans, the locus of reasoning, planning, decision making, control of social behavior and some aspects of language, all of which relate to human uniqueness (Parrington, 2023, p. 126). He has brain waves of different frequencies conveying specific sensory signals and combining together into a unified conscious whole, thus explaining how we bind together different aspects of experience into a seamless experience (Parrington, 2023, p. 19).

Parrington argues that "the effect of language and other cultural tools" have transformed human consciousness, which "provides another level of binding." This surely means, he says, that "our sense of self is not an illusion, but rather a very real phenomenon based on the binding role of brain waves and the extra element of unity based on conceptual thought" (Parrington, 2023, p. 147). Rejecting what he calls "outdated models of the brain as a hard-wired circuit diagram," he argues that meaning is created within our heads through a dynamic interaction of oscillating brain waves.

Parrington believes that "in some ways" he has addressed the hard problem and "hopefully demonstrated that there is nothing magical about human consciousness" (Parrington, 2023, p. 196). He frames his theory, as he must, within an evolutionary context, seeking to explain inner speech, thought, and self-conscious awareness in terms of the evolved neural circuitry that undergirds these uniquely human capacities, especially as manifest in language and tools. While Parrington's goal, as Susan Blackmore puts it, is to develop "a material explanation of human consciousness"—and "he has done a great job of exploring material explanations of thought, perception, self-representation and behavioral control"—but none of this, Blackmore concludes, "gets at the deeper questions about subjective experience" (Blackmore, 2023).

9.10. *Phylogenetic evolution*

Phylogenetic Evolution, the phylogenetic evolution of consciousness, at first blush, is not a specific theory of consciousness per se. Rather, it is recruited as the mechanistic process for many (but not all) of the theories on the Landscape. Yet, is there a sense in which phylogenetic evolution can become a prime explanation in its own right?

Certainly, according to Dennett (9.10.1), LeDoux (9.10.2) and Ginsburg/Jablonka (9.10.3), consciousness exemplifies Theodosius Dobzhansky famous adage, "Nothing in biology makes sense except in the light of evolution" (Dobzhansky, 1973).

Neuroscientists and writers Ogi Ogas and Sai Gaddam present a step-by-step simulation of how evolution produced consciousness. It is a tale of eighteen "increasingly intelligent minds," as they say, from the simple stimulus-response of microbes interacting with their environments to the limitless creativity of humankind (and beyond). Leveraging the "resonance" theories of Stephen Grossberg (9.4.2), their mentor, they tell a story of what each "new" mind could do that previous minds could not (Ogas and Gaddam, 2022).

To physicist Lawrence Krauss, "consciousness is a slippery quality because it exists on a spectrum in the evolutionary development of life

that is very difficult to measure or quantify" (Krauss, 2023, p. 195). He stresses "the phenomenon of consciousness is the one area I know of in science where the forefront discussions seem to be made by philosophers equally as often as they are made by experimental cognitive scientists," which, he says softly, is "an indication of a science in its early stages" (Krauss, 2023, pp. 193–194).

Amidst the surfeit of competing neurobiological theories, Krauss is most comfortable pursuing "the possible distinct evolutionary advantages that consciousness might endow humans with." He follows the thread that "feelings emerged as ever more complex systems evolved to incorporate higher-order cognitive processing to issues of survival and homeostasis" (9.5.). Consciousness, through introspection, he says, "could build on the nervous system monitoring of basic internal body conditions to produce novel, rather than innate, survival strategies. The ability to use internal representations of goals, whether from cognitive maps or stored memories, to flexibly respond to the changing environmental conditions, was a huge evolutionary leap, and has been noted to probably exist only in some mammals and perhaps in birds" (Krauss, 2023, pp. 211–212).

Philosophers David Buller and Valarie Hardcastle offer an alternative to the strong evolutionary claim that "the mind contains 'hundreds or thousands' of 'genetically specified' modules, which are evolutionary adaptations for their cognitive functions." They argue that "while the adult human mind/brain typically contains a degree of modularization, its 'modules' are neither genetically specified nor evolutionary adaptations. Rather, they result from the brain's developmental plasticity, which allows environmental task demands a large role in shaping the brain's information-processing structures." They maintain that "the brain's developmental plasticity is our fundamental psychological adaptation, and the 'modules' that result from it are adaptive responses to local conditions, not past evolutionary environments" (Buller and Hardcastle, 2000).

Questions remain. What creatures are conscious and to what degree? How low on the phylogenetic scale must one descend to wink out anything resembling human consciousness? For example, does an octopus have phenomenal consciousness? Philosopher (and scuba-diver) Peter Godfrey-Smith not only affirms octopus higher intelligence, he also traces the evolution of mental properties in the primordial seas, claiming that "evolution built minds not once but at least twice (Godfrey-Smith, 2016).

Appreciating Godfrey-Smith's work, Carlo Rovelli uses the "complex intellectual abilities" of octopuses as "a valuable case study" of consciousness. In recent decades, he observes, "the phrase 'the problem of the nature of consciousness' has taken the place of what in the past used to be the problem of the meaning of soul, spirit, subjectivity, intelligence, perception, understanding, existing in the first person, being aware of a self …" Consciousness is neurobiological, Rovelli asserts, and one way to tackle the issue is to observe our non-human cousins and even octopuses, an extremely distant relative. The octopus, he offers, "is the extraterrestrial that we have been looking for in order to study a possible independent realization of consciousness" (Rovelli, 2020).

Raymond Tallis questions the entire enterprise of assuming "the [evolutionary] advantage of being a conscious organism rather than a self-replicating bag of chemicals innocent of its own existence." His skeptical argument against "what *seems* like a no-brainer" is "not to start near the end of the story, with complex, sophisticated organisms such as higher mammals … [whose] life depends on conscious navigation through the world." No, he says, "we must begin at the beginning: by asking, for example, what survival value is conferred on a photosensitive cell in virtue of its organism being *aware* of the light incident upon it. And the answer appears to be: 'none.'" Tallis argues, "If there's no reason to believe that the sentience of primitive organisms would give them an edge over the competition, there is no starting point for the evolutionary journey to the sophisticated consciousness we see in higher organisms like you and me." The mystery of consciousness, he concludes, "remains intact" (18.4) (Tallis, 2023).

Most experts, scientists and philosophers who study the evolution of mind, support a gradual, incrementalistic theory of mental development, much like Dennett, Godfrey-Smith, and Ogas/Gaddam. There are dissenting voices: for example, Nicholas Humphrey (9.8.6) and perhaps Noam Chomsky (9.9.1).

Here's the point. In considering the multifarious theories on the Landscape of Consciousness, one should overlay each theory with its putative phylogenetic evolutionary development. Ask, "What was the process that brought it about?"

9.10.1. *Dennett's evolution of minds*

Daniel Dennett delights us with the wondrous and sometimes counterintuitive power of evolution in the development of consciousness (or, more generally, "minds"), notably in his psychohistory journey, *From Bacteria to Bach and Back: The Evolution of Minds* (Dennett, 2017). Even if one doesn't wholly subscribe to Dennett's own explanations of consciousness (9.2.4)—which I don't—everyone's understanding of consciousness can be enriched by Dennett's probative and insightful way of thinking (Dennett, 2007, 2023a, 2023b). Dennett describes evolution as a "universal acid" that "eats through just about every traditional concept, revolutionizing world-views" (Dennett, 1995).

"How come there are minds?" is Dennett's big evolutionary question, "And how is it possible for minds to ask and answer this question?" His short answer is that "minds evolved and created thinking tools that eventually enabled minds to know how minds evolved, and even to know how these tools enabled them to know what minds are … We know there are bacteria; dogs don't; dolphins don't; chimpanzees don't. Even bacteria don't know there are bacteria. Our minds are different. It takes thinking tools to understand what bacteria are, and we're the only species (so far) endowed with an elaborate kit of thinking tools" (Dennett, 2017).

Dennett reflects that he has been struggling through the "thickets and quagmires" of the mind question for over fifty years, and he has found a path, built on evolution, that "takes us all the way to a satisfactory—and satisfying—account of how the 'magic' of our minds is accomplished without any magic, but it is neither straight nor easy" (Dennett, 2017).

9.10.2. *LeDoux's deep roots of consciousness*

Neuroscientist Joseph LeDoux argues that the key to understanding human consciousness and behavior lies in viewing evolution through the prism of the first living organisms. He tracks the evolutionary timeline to show how even the earliest single-cell organisms had to solve the same problems we and our cells have to solve, and how the evolution of nervous systems enhanced the ability of organisms to survive and thrive and have brought about the emergence of consciousness (LeDoux, 2019).

Motivated by his long-standing interest in how organisms detect and respond to danger, LeDoux found in evolution the "deep roots" of human abilities, hence the "deep roots" of consciousness, which "can be traced back to the beginning of life." LeDoux argues that what we have inherited from our long chain of biological ancestors is not a fear circuit but rather "a defensive survival circuit that detects threats, and in response, initiates defensive survival behaviours and supporting physiological adjustments." Fear, on the other hand, from LeDoux perspective, is a recent expression of cortical cognitive circuits. Danger and survival have a deep history; consciousness, a shallower one (LeDoux, 2021).

9.10.3. *Ginsburg and Jablonka's associative learning during evolution*

Neurobiologist Simona Ginsburg and evolutionary theorist Eva Jablonka propose that learning during evolution has been "the driving force" in the transition to basic or minimal consciousness. They identify the evolutionary marker as "a complex form of associative learning, which they term "unlimited associative learning" and which "enables an organism to ascribe motivational value to a novel, compound, non-reflex-inducing stimulus or action, and [to] use it as the basis for

future learning" (Ginsburg and Jablonka, 2019).

Associative learning, Ginsburg and Jablonka argue, "drove the Cambrian explosion and its massive diversification of organisms." They suggest that "consciousness can take many forms and is found even in such animals as octopuses (who seem to express emotions by changing color) and bees (who socialize with other bees)" (Ginsburg and Jablonka, 2022). As for the evolutionary transition to human rationality, they propose "symbolic language as a similar type of marker" (Ginsburg and Jablonka, 2019).

9.10.4. Cleeremans and Tallon-Baudry's phenomenal experience has functional value

Cleeremans and Tallon-Baudry propose that "subject-level experience—'What it feels like'—is endowed with intrinsic value, and it is precisely the value agents associate with their experiences that explains why they do certain things and avoid others." Because experiences have value and guide behavior, they argue, "consciousness has a function" and that under "this hypothesis of 'phenomenal worthiness' … conscious agents 'experience' things and 'care' about those experiences" (Cleeremans and Tallon-Baudry, 2022).

The authors note that "the function of consciousness" has been "addressed mostly by philosophers," yet "surprisingly few things have been written about [it] … in the neuroscientific or psychological literature." The reason, they surmise, is the "classical view" that "subjective experience is a mere epiphenomenon that affords no functional advantage." They reject such "consciousness inessentialism" by appealing to "how the concept of value has been approached in decision-making, emotion research and consciousness research" and by arguing that "phenomenal consciousness has intrinsic value"—such as it being "the central drive for the discovery and creation of new behaviours." They conclude that consciousness "must have a function" (Cleeremans and Tallon-Baudry, 2022).

Under their hypothesis, "consciousness would have evolved and been selected because it adds an important degree of freedom to the machinery of reward-based behaviour: behaviour that seems purposeless from a purely functional perspective nevertheless has intrinsic value. But this, crucially, only holds when associated with conscious experience." Phenomenal experience, they speculate, "might act as a mental currency of sorts, which not only endows conscious mental states with intrinsic value but also makes it possible for conscious agents to compare vastly different experiences in a common subject-centered space"—a feature, they claim, that "readily explains the fact that consciousness is 'unified.'" They offer the "phenomenal worthiness hypothesis" as a way to make "the 'hard problem' of consciousness more tractable, since it can then be reduced to a problem about function"—an offering unlikely to persuade nonmaterialists (Cleeremans and Tallon-Baudry, 2022).

9.10.5. Andrew's consciousness without complex brains

Philosopher Kristin Andrews, an expert on animal minds, argues that progress in consciousness studies has been hampered by prevailing conventional wisdom that for an organism to be conscious, a complex brain is required. She advocates moving "past a focus on complex mammalian brains to study the behavior of 'simpler' animals" (Andrews, 2023).

In forming her argument, Andrews rehearses how Crick and Koch helped turn consciousness studies into a real science by supposing that "higher mammals" possess some essential features of consciousness (9.2.2), by setting aside the still-common Cartesian view that language is needed for conscious experience, and by assuming that a nervous system is necessary for consciousness. She recruits the Cambridge Declaration on Consciousness, which states that "there is sufficient evidence to conclude that 'all mammals and birds, and many other creatures, including octopuses' experience conscious states." The Declaration, she notes, identifies five consciousness markers (not all of which would be necessary): "homologous brain circuits; artificial stimulation of brain regions causing similar behaviours and emotional expressions in humans and other animals; neural circuits supporting behavioural/electrophysical states of attentiveness, sleep and decision-making; mirror self-recognition; and similar impacts of hallucinogenic drugs across species" (Andrews, 2023).

But Andrews posits that "emphasis on the neurological … may be holding the science back," and that animal research suggests "*multiple realizability*—the view that mental capacities can be instantiated by very different physical systems." If neuroscience looks only at *slightly* different physical systems (say, just other primates or even mammals), she says, "we may be overlooking the key piece to the consciousness puzzle."

Andrews asks, "What might we learn if our anthropocentrism didn't lead us to focus on the brain as the relevant part of physiology needed for consciousness, but instead led us to examine the behaviours that are associated with experiences?" She advocates studying "the nature of consciousness by looking at bees, octopuses and worms as research subjects. All these animals have a robust profile of behaviours that warrant the hypothesis that they are conscious. Moving away from painful stimuli, learning the location of desirable nutrients, and seeking out what is needed for reproduction is something we share widely with other animals." By studying simple animals, she offers, we can simplify research on consciousness (Andrews, 2023).

Andrews likens studying consciousness to studying the origin of life on earth and searching for life on other planets. For each, there is only one confirmed instance. It's the "N = 1 problem." "If we study only one evolved instance of consciousness (our own)," she says, "we will be unable to disentangle the contingent and dispensable from the essential and indispensable." She offers "good news" in that "consciousness science, unlike the search for extraterrestrial life, can break out of its N = 1 problem using other cases from our own planet." Typically, consciousness scientists study other primates (e.g., macaque monkeys) and, to a lesser extent, other mammals, such as rats. "But the N = 1 problem still bites here. Because the common ancestor of the primates was very probably conscious, as indeed was the common ancestor of all mammals—we are still looking at the same evolved instance (just a different variant of it). To find independently evolved instances of consciousness, we really need to look to much more distant branches of the tree of life" (Andrews and Birch, 2023).

Andrews speculates that "sentience has evolved only three times: once in the arthropods (including crustaceans and insects), once in the cephalopods (including octopuses) and once in the vertebrates." But she cannot rule out "the possibility that the last common ancestor of humans, bees and octopuses, which was a tiny worm-like creature that lived more than 500 million years ago, was itself sentient—and that therefore sentience has evolved only once on Earth."

In either case, she argues, "If a marker-based approach does start pointing towards sentience being present in our worm-like last common ancestor, we would have evidence against current theories that rely on a close relationship between sentience and special brain regions adapted for integrating information, like the cerebral cortex in humans. We would have grounds to suspect that many features often said to be essential to sentience are actually dispensable" (Andrews and Birch, 2023). Conversely, it could mean that sentience is related to some unknown feature(s).

To Andrews, the philosophy of animal minds addresses profound questions about the nature of mind as they cut across animal cognition and philosophy of mind. Key topics include the evolution of consciousness, tool use in animals, animal culture, mental representation, belief, communication, theory of mind, animal ethics, and moral psychology (Andrews, 2020a). Andrews outlines "the scientific benefits of treating animals as sentient research participants who come from their own social contexts" (Andrews, 2020b).

Andrews concludes: "Just as Crick and Koch pushed back on the popular view of their time that language is needed for consciousness, today we should push back on the popular view of our time that a

complex brain is needed for consciousness." She also speculates: "If we recognize that our starting assumptions are open to revision and allow them to change with new scientific discoveries, we may find new puzzle pieces, making the hard problem a whole lot easier" (Andrews, 2023).

In essence, then, Andrews reverses the traditional "neurocentric" argument of consciousness. Whereas the common assumption is that consciousness is (somehow) related to the complexity of the nervous system, but because all neurobiological advances, collectively, have not progressed in solving the hard problem, then perhaps the common assumption is not correct and the generation of consciousness can be found outside the nervous system. Thus, rather than assuming that organisms without complex nervous systems cannot be conscious, perhaps a radical new approach might be to consider that these organisms are (in a way) conscious and focus research on how such "lower" or "primitive" consciousness might come about.

Finally, regarding our current obsession with discerning AI sentience, Andrews claims that "without a deep understanding of the variety of animal minds on this planet, we will almost certainly fail" (Andrews and Birch, 2023).

Neuroscience/consciousness writer Annaka Harris goes further, questioning our potentially false but deeply ingrained intuition that "systems that act like us are conscious, and those that don't are not." Plants and philosophical zombies, she says, indicate that this human-centric intuition "has no real foundation." (A. Harris, 2020, 2019). Consciousness may not even require a brain (A. Harris, 2022).

9.10.6. Reber's cellular basis of consciousness

Cognitive psychologist Arthur Reber dubs his theory of the origins of mind and consciousness the Cellular Basis of Consciousness (CBC), arguing that "sentience emerged with life itself." He states, "The most primitive unicellular species of bacteria are conscious, though it is a sentience of a primitive kind. They have minds, though they are tiny and limited in scope." He rejects that "minds are computational and can be captured by an artificial intelligence." He develops CBC using standard models of evolutionary biology, leveraging the "remarkable repertoire of single-celled species that micro- and cell-biologists have discovered … Bacteria, for example, have sophisticated sensory and perceptual systems, learn, form memories, make decisions based on information about their environment relative to internal metabolic states, communicate with each other, and even show a primitive form of altruism." All such functions, Reber contends, "are indicators of sentience" (Reber, 2016, 2018).

Reber's model is based on a simple, radical axiom: "Mind and consciousness are not unique features of human brains. They are grounded in inherent features present in simpler forms in virtually every species. Any organism with flexible cell walls, a sensitivity to its surrounds and the capacity for locomotion will possess the biological foundations of mind and consciousness." In other words, "subjectivity is an inherent feature of particular kinds of organic form. Experiential states, including those denoted as 'mind' and 'consciousness,' are present in the most primitive species" (Reber, 2016).

Reber founds his model on several principles: "Complexity has its roots in simplicity. Evolution has a pyramidal schema. Older forms and functions lie at the base, the more recently evolved ones toward the zenith …. In virtue of the nature of pyramidal systems, the older structures and the behaviors and processes that utilize them will be relatively stable, showing less individual-to-individual and species-to-species variation. They will also, in virtue of their foundational status, be robust and less likely to be lost. Adaptive forms and functions are not jettisoned; they are modified and, if the selection processes are effective, they will become more complex and capable of greater behavioral and mental flexibility and power" (Reber, 2016).

Reber claims that his model has several conceptual and empirical virtues, among them: "(a) it (re)solves the problem of how minds are created by brains—the "Hard Problem"—by showing that the apparent difficulty results from a category error; (b) it redirects the search for the origins of mind from complex neural structures to foundational biomechanical ones; and (c) it reformulates the long-term research focus from looking for 'miracle moments' where a brain is suddenly capable of making a mind to discovering how complex and sophisticated cognitive, emotional and behavioral functions evolve from more primitive ones" (Reber, 2016).

In addressing the hard problem, Reber argues that the reason it looks "hard" is "because it assumes that there is some '*added*' element that comes from having a mind." However, he says, "from the CBC perspective the answer is easily expressed. Organisms have minds, or the precursors of what we from our philosophy of mind perspective think of as minds, because they are an inherent component of organic form. What gets 'added' isn't ontologically novel; it's a gradual accretion of functions that are layered over and interlock with pre-existing ones" (Reber, 2016).

In the CBC framework, "All experience is mental. All organisms that experience have minds, all have consciousness." Reber contends that this way of thinking repositions the problem, from how brains create consciousness (i.e., the hard problem) to how all experience is consciousness. "Instead of trying to grasp the neuro-complexities in brains that give rise to minds, we can redirect the focus toward understanding how particular kinds of basic, primitive organic forms came to have the bio-sensitivity that is the foundation of subjectivity." Reber recognizes that "this argument requires a commitment to a biological reductionism." It would also undermine Functionalism (9.1.3) in that mental states would be "intrinsically hardware *dependent*" (Reber, 2016).

9.10.7. Feinberg and Mallatt's ancient origins of consciousness

Neurologist/psychiatrist Todd Feinberg and evolutionary biologist Jon Mallatt propose that consciousness appeared much earlier in evolutionary history than is commonly assumed, and therefore all vertebrates and perhaps even some invertebrates are conscious. By assembling a list of the biological and neurobiological features that seem responsible for consciousness, and by juxtaposing the fossil record of evolution, the authors argue that about 520–560 million years ago, "the great 'Cambrian explosion' of animal diversity produced the first complex brains, which were accompanied by the first appearance of consciousness; simple reflexive behaviors evolved into a unified inner world of subjective experiences" (Fineberg and Mallatt, 2016).

Doing what they call "neuroevolution," Feinberg and Mallatt put forth the even more unconventional idea that the origin of consciousness goes back to the origin of life, in that single-cell creatures respond to stimuli from the environment, whether attracted to food sources or repelled by harmful chemicals. The authors call this process "sensory consciousness" [but which others may call stimulus-response patterns unworthy of the "consciousness" appellation]. In addition, the cell membrane distinguishes self from non-self, which becomes another baby step on the long evolutionary journey to human consciousness. A crucial developmental step, they say, was the evolution of "hidden layers" of clusters of intermediary nerve cells that process and relay internal signals between sensory-input and motor-output nerve cells. Driven by evolutionary pressures, these clusters would go on to evolve into primitive and then more complex brains (Fineberg and Mallatt, 2016; Rose, 2017).

If indeed these were the historical facts, it would naturally follow that "all vertebrates are and have always been conscious—not just humans and other mammals, but also every fish, reptile, amphibian, and bird." Moreover, Feinberg and Mallatt find that many invertebrates—arthropods (including insects and probably crustaceans) and cephalopods (including the octopus)—"meet many of the criteria for consciousness." Their proposal challenges standard-model theory that "consciousness evolved simultaneously but independently in the first vertebrates and possibly arthropods more than half a billion years ago." Combining evolutionary, neurobiological, and philosophical approaches enables Feinberg and Mallatt to cast a broader group of animals that are conscious, though it is less clear how their theory offers—as the

marketing claims, the authors less so—"an original solution to the 'hard problem' of consciousness" (Fineberg and Mallatt, 2016).

9.10.8. Levin's technological approach to mind everywhere

Developmental and synthetic biologist Michael Levin introduces "a framework for understanding and manipulating cognition in unconventional substrates," which he calls 'TAME—Technological Approach to Mind Everywhere." He asserts that creating "novel embodied cognitive systems (otherwise known as minds) in a very wide variety of chimeric architectures combining evolved and designed material and software"—via synthetic biology and bioengineering—"are disrupting familiar concepts in the philosophy of mind, and require new ways of thinking about and comparing truly diverse intelligences, whose composition and origin are not like any of the available natural model species." TAME, Levin says, "formalizes a non-binary (continuous), empirically-based approach to strongly embodied agency," and it "provides a natural way to think about animal sentience as an instance of collective intelligence of cell groups, arising from dynamics that manifest in similar ways in numerous other substrates" (Levin, 2022).

By focusing on cognitive function, not on phenomenal or access consciousness, Levin takes "TAME's view of sentience as fundamentally tied to goal-directed activity," noting carefully that "only some aspects of which can be studied via third-person approaches." Provisionally, Levin suggests that consciousness "comes in degrees and kinds (is not binary)," for the same reasons he argues for continuity of cognition: "if consciousness is fundamentally embodied, the plasticity and gradual malleability of bodies suggest that it is a strong requirement for proponents of phase transitions to specify what kind of 'atomic' (not further divisible) bodily change makes for a qualitative shift in capacity consciousness" (Levin, 2022).

Although Levin takes the null or default hypothesis to be the relatively smooth continuity of consciousness across species and phylogenetically, he hedges that "the TAME framework is not incompatible with novel discoveries about sharp phase transitions." He points to future, radical brain-computer interfaces in human patients as "perhaps one avenue where a subject undergoing such a change can convince themselves, and perhaps others, that a qualitative, not continuous, change in their consciousness had occurred."

In a radical implication of TAME, Levin argues that "while 'embodiment' is critical for consciousness, it is not restricted to physical bodies acting in 3D space, but also includes perception-action systems working in all sorts of spaces." This implies, he says, "counter to many people's intuitions, that systems that operate in morphogenetic, transcriptional, and other spaces should also have some (if very minimal) degree of consciousness. This in turn suggests that an agent, such as a typical modern human, is really a patchwork of many diverse consciousnesses, only one of which is usually capable of verbally reporting its states (and, not surprisingly, given its limited access and self-boundary, believes itself to be a unitary, sole owner of the body)."

Levin remains "skeptical about being able to say anything definitive about consciousness per se (as distinct from correlates of consciousness) from a 3rd-person, objective perspective." Yet, he muses, "The developmental approach to the emergence of consciousness on short, ontogenetic timescales complements the related question on phylogenetic timescales, and is likely to be a key component of mature theories in this field" (Levin, 2022).

9.10.9. No hard problem in William James's psychology

Writer Tracy Witham argues that William James flipped the paradigm in which the hard problem arises, because James viewed consciousness through a problem he believed it solves by selecting for adaptive responses to specific environmental situations (James, 1890). Essentially, James believed that a brain complex enough to support a proliferation of options for responding to environmental situations is more likely to obscure than to identify the best option to use, unless that brain also has a selection mechanism for choosing adaptive over less, non-, and maladaptive options. But the question remains, Witham says, whether consciousness is, at least, a good prima facie fit, to address what can be called "the selection problem."

The hypothesis that underlies James's view, she says, is that consciousness increases an organism's fitness by "bringing … pressure to bear in favor of those of its performances which make for the most permanent interests of the brain's owner …" (James, 1890, p. 140).

Specifically, the role James gave to consciousness must be understood only in the context of the formation of de facto ends which he believed form when preferred sensations are recalled in their absence (James, 1890, p. 78). This context is crucial, because it is consciousness that confers the preferences for some sensations over others and thereby serves as the source of the ends. But to understand why James gave consciousness that role, Witham says we need to understand his two-word phrase, "cerebral reflex," (James, 1890, p. 80). which implies a stimulus-and-response schema is the basis for the ends-and-means couplings that form cerebral reflexes. However, there is a problem with the implication. For this to work, ends must stand in for stimuli, arising in interactions between organisms and their environments.

The problem is solved, Witham says, if consciousness just is what it seems to be: the means by which we reflect on our interactions with our environments to sense whether the interactions are favorable or not. So, what consciousness seems to be fits James's hypothesis perfectly, that its role is to "bring … pressure to bear [in favor of] those of our performances" that are adaptive. Reflective experience, in short, makes it possible to identify experiences of our environmental interactions that contain adaptive behaviors and retain them as cerebral reflexes for future use. But then, as the means to solve the selection problem, consciousness becomes an adaptive adaptation in the sense of being an adaptation selecting for adaptive behaviors. And it does so by being, indeed, what it seems to be: an adaptive adaptation that is a marvelous source of solutions, not a confounding source of problems.

The critical question, however, is whether a zombie-like black box of sufficient complexity could perform environmentally driven, fitness enhancing, evolutionarily successful activities, and if so, why then the radical advent of something so startlingly novel in the universe: inner experience? In other words, while the question of why consciousness was favored and selected by evolution is important, it is not the question of what consciousness actually *is*, which of course is the hard problem.

10. Non-reductive physicalism

Non-Reductive Physicalism takes consciousness to be entirely physical, solely the product of biological brains, but mental states or properties are irreducibly distinct from physical states or properties such that they cannot be entirely explained by physical laws, principles or discoveries (in brains or otherwise) (Macdonald and Macdonald, 2019).

Non-reductive Physicalism was, in part, a response to conceptual problems in the early identity theories of physicalism where mental properties or kinds were literally the same thing as physical properties or kinds. This was challenged by several conceptual conundrums: the multiple realizability of the same mental properties or kinds by different physical properties or kinds (Hilary Putnam); the intentional essence of mental phenomena, which seems so radically different from physical laws or things (Donald Davidson's "Anomalous Monism," 14.2); and the apparent unbridgeable gap between physics and the special sciences (Jerry Fodor) (Macdonald and Macdonald, 2019).

While mental states are generated entirely by physical states (of the brain), non-reductive physicalism maintains that they are truly other than physical; mental states are ontologically distinct.

This would seem to make Non-Reductive Physicalism a form of property dualism (15.1) in that both recognize real mental states and yet only one kind of substance, matter—but, as expected, some adherents of each reject the claims of the other. If Non-Reductive Physicalism is indeed a form of property dualism, it would be perhaps the predominant contemporary kind.

A core mechanism of Non-Reductive Physicalism is emergence, where novel properties at higher levels of integration are not discernible (and perhaps not even predictable, ever) from all-you-can-know at lower or more fundamental levels. A prime feature of Non-Reductive Physicalism is often "top-down causation," where the content of consciousness is causally efficacious—qualia can do real work (contra Epiphenomenalism, 9.1.2).

Some Christian philosophers, such as Nancey Murphy (10.2), who seek greater consonance between contemporary science and the Christian faith, look to Non-Reductive Physicalism as a nondualistic account of the human person. It does not consider the "soul" an entity separable from the body, such that scientific statements about the physical nature of human beings would be referring to exactly the same entity as theological statements concerning the spiritual nature of human beings (Brown et al., 1998). The structure of Non-Reductive Physicalism is said to enhance the Judeo-Christian concept of "resurrection of the dead" as opposed to what is said to be the non-Judeo-Christian doctrine of an "immortal soul" (Van Inwagen, 1995).

On the other hand, Christian philosopher J.P. Moreland takes dualism to be "the clear teaching of Scripture" that "overwhelmingly sets forth a dichotomy of soul and body" and he decries those Christian thinkers who deny this conclusion, especially adherents of Non-Reductive Physicalism (Moreland, 2014).

Philosopher Jaegwon Kim's objections to Non-Reductive Physicalism, based on causal closure and overdetermination, highlight its three principles: the irreducibility of the mental to the physical; some version of mental-physical supervenience; and the causal efficaciousness of mental states. The problem, according to Kim, is that when these three commitments are combined, an inconsistency is generated that entails the causal impotence of mental properties (Kim, 2024).

I've always been puzzled by Non-Reductive Physicalism in that I can well understand how, under physicalism, consciousness is non-reductive in practice, but how non-reductive in principle? Conversely, if indeed consciousness is in principle non-reductive—impossible for science ever to explain how it works in terms of fundamental physical constituents—it would seem to require the ontological reality of non-physical properties (at least by current boundaries), which would seem to embed a contradiction. Or else, by what mechanisms could such higher-level non-reducible "laws" work? Perhaps by something analogous to quantum fields but operating at higher levels? Occam is sharpening his Razor.

10.1. Ellis's strong emergence and top-down causation

Mathematical physicist George Ellis approaches consciousness by combining non-reductionist strong emergence and top-down causation in the context of "possibility spaces" (Ellis, 2017a). While he calls consciousness "the biggest unsolved problem in science," he sees the larger vision that consciousness transforms the nature of existence itself such that existence is quite different than it might have been had there been only nonconscious matter (Ellis, 2006).

Ellis begins with four kinds of entities, or "Worlds," whose existence requires explanation: matter and forces, consciousness, physical and biological possibilities, and mathematical reality. An adequate explanation of what exists, he says, must encompass all four kinds of entities, in two forms: generic forms of the kinds of entities that might exist, and specific instantiations of some of these possibilities that actually occur or have occurred in the real universe. The first are possibilities, and the second are actualizations of those possibilities (Ellis, 2015).

"Possibility spaces," then, show what is and what is not possible for entities of whatever kind we are discussing. For example, the possibility space for classical physics is all possible states of the system; for quantum physics, the state spaces for the system wave function are Hilbert spaces.

For consciousness, possibility spaces include separate subspaces for all possible thoughts, all possible qualia, all possible emotions—each with its own character. Ellis says, "The rationale is always the same: if these aspects of consciousness occur, then it is possible that they occur; and that possibility was there long before they ever occurred, and so is an abstract feature of the universe. The physical existence of brains enables their potential existence to be actualized" (Ellis, 2015).

Ellis embeds his theory of consciousness in the presence and power of strong emergence, where properties of a system are impossible to predict in terms of the properties of its constituents, even in principle; and of top-down causation, where higher hierarchical levels exert causal force on lower levels, even though the higher levels are comprised only of the lower levels. Strong emergence, according to Ellis, works throughout the physical world, particularly in biology where the whole is more than just the sum of its parts (Ellis, 2017b, 2019).

He explains that "emergence is possible because downward causation takes place right down to the lower physical levels, hence, arguments from the alleged causal completeness of physics and supervenience are wrong. Lower levels, including the underlying physical levels, are conscripted to higher level purposes; the higher levels are thereby causally effective, so strong emergence occurs. No violation of physical laws is implied. The key point is that outcomes of universally applicable generic physical laws depend on the context when applied in specific real world biological situations … including the brain" (Ellis, 2019).

Continuing to focus on emergence and downward causation, Ellis "considers how a classification of causal effects as comprising efficient, formal, material, and final causation can provide a useful understanding of how emergence takes place in biology and technology, with formal, material, and final causation all including cases of downward causation; they each occur in both synchronic and diachronic forms." Taken together, he says, the four causal effects "underlie why all emergent levels in the hierarchy of emergence have causal powers (which is Noble's principle of biological relativity) and so why causal closure only occurs when the upward and downward interactions between all emergent levels are taken into account, contra to claims that some underlying physics level is by itself causality complete" A key feature, Ellis adds, is that "stochasticity at the molecular level plays an important role in enabling agency to emerge, underlying the possibility of final causation occurring in these contexts" (Ellis, 2023).

Ellis's two points here, if veridical and representing reality, would have extraordinary impact on theories of consciousness, and the two bear repeating: (i) emergence has causal powers at all levels in biology, and (ii) top-down causation as well as bottom-up causation is necessary for causal closure. At once, almost every Materialism Theory—maybe *every* Materialism Theory (more than 90 at last count)—would be shown insufficient to explain consciousness (even if one or more were still necessary to do so).

Ellis highlights questions that he claims reductionists cannot answer: "Reductionists cannot answer why strong emergence (unitary, branching, and logical) is possible, and in particular why abstract entities such as thoughts and social agreements can have causal powers. The reason why they cannot answer these questions is that they do not take into account the prevalence of downward causation in the world, which in fact occurs in physics, biology, the mind, and society" (Ellis 2017b, 2019).

David Chalmers distinguishes strong downward causation from weak downward causation. "With strong downward causation, the causal impact of a high-level phenomenon on low-level processes is not deducible even in principle from initial conditions and low-level laws. With weak downward causation, the causal impact of the high-level phenomenon is deducible in principle, but is nevertheless unexpected. As with strong and weak emergence, both strong and weak downward causation are interesting in their own right. But strong downward causation would have more radical consequences for our understanding of nature." However, Chalmers concludes, "I do not know whether there is any strong downward causation, but it seems to me that if there is any strong downward causation, quantum mechanics is the most likely locus

for it … The question remains wide open, however, as to whether or not strong downward causation exists" (Chalmers, 2008).

10.2. Murphy's non-reductive physicalism

Christian philosopher Nancey Murphy, reflecting increasing Christian scholarship calling for acceptance of physicalism, argues that the theological workability of physicalism depends on the success of an argument against reductionism. She takes Non-Reductive Physicalism, a common term in philosophy of mind, to "signal opposition to anthropological dualisms of body and either mind or soul, as well as to physicalist accounts that reduce humans to *nothing but* complex animals." She sets herself the task of showing that "*non*-reductive physicalism is philosophically defensible, compatible with mainstream cognitive neuroscience, and is also acceptable biblically and theologically"—a task made more difficult because she must be able to explain "how Christians for centuries could have been wrong in believing dualism to be biblical teaching" (Murphy, 2017, 2018).

To Murphy, part of the answer lies in translation. She focuses on the Septuagint, a Greek translation of the Hebrew scriptures that dates from around 250 BC. This text translated Hebrew terminology into Greek, and "it then contained terms that, *in the minds of Christians influenced by Greek philosophy*, referred to constituent *parts* of humans. Later Christians have obligingly read and translated them in this way." A key instance, she says, is "the Hebrew word *nephesh,* which was translated as *psyche* in the Septuagint and later into English as 'soul' … In most cases the Hebrew or Greek term is taken simply to be a way of referring to the whole living person" (Murphy, 2018).

Murphy is impressed by how many capacities or faculties of the soul, as attributed by Thomas Aquinas, are now well explained by cognitive science and neurobiology. She is moved by "localization studies—that is, research indicating not only *that* the brain is involved in specific mental operations, but that very specific regions are."

That gives her the physicalism—the easy part, I'd say. What about the non-reductive—the hard part?

An obvious answer to the problem of neurobiological reductionism, Murphy says, would be the presence and power of downward causation or whole-part causation. That is, if causal reductionism is the thesis that all causation is from part to whole, then the complementary alternative causation would be from whole to part. If we describe a more complex system, such as an organism, as a higher-level system than the simple sum of its biological parts, then causal reductionism is bottom-up causation, and the alternative, causal anti-reductionism, or causal non-reductionism, is top-down or downward causation (Murphy, 2017).

To support Non-reductive Physicalism by undermining reductionist determinism, Murphy recruits contemporary concepts in systems theory, such as chaos theory, non-linear dynamics, complex adaptive systems, systems probabilities, and systems biology. Thus, Murphy posits, an understanding of downward causation in complex systems allows for the defeat of neurobiological reductionism.

Finally, Murphy muses that "non-reductive physicalism, while it is the term most often used in philosophy, is perhaps not the best for purposes of Christian anthropology, because, at least by connotation, it places disproportionate stress on the *aspect* of our physicality." She quotes theologian Veli-Matti Kärkkäinen in proposing a replacement: "multi-aspect monism" (Murphy, 2018).

10.3. Van Inwagen's Christian materialism and the resurrection of the dead

Christian philosopher/metaphysician Peter van Inwagen combines a wholly materialist ontology of the human person (Van Inwagen, 2007a) with a committed belief in the resurrection of the dead as the Christian hope of eternal life. His thesis is that "dualism is a Greek import into Christianity and that the Christian resurrection of the dead does not presuppose dualism" (Van Inwagen, 1995, 2007b).

He states, "Most Christians seem to have a picture of the afterlife that can without too much unfairness be described as 'Platonic.' When one dies, one's body decays, and what one is, what one has been all along, an immaterial soul or mind or self, continues to exist"—a picture and a doctrine that Van Inwagen finds "unsatisfactory, both as a Christian and as a philosopher" (Van Inwagen, 1995).

He reflects, "when I enter most deeply into that which I call myself, I seem to discover that I am a living animal. And, therefore, dualism seems to me to be an unnecessarily complicated theory about my nature unless there is some fact or phenomenon or aspect of the world that dualism deals with better than materialism does" (which he does not find). As for the argument from phenomenal consciousness, he admits, "It is a mystery how a material thing could have sensuous properties [phenomenal consciousness]," but then retorts, "simply and solely because it is a mystery how *anything* could."

Van Inwagen rejects dualism biblically as well as philosophically. After examining biblical texts in the Old Testament, Van Inwagen finds "little to support dualism in the Old Testament, and much that the materialist will find congenial." His analysis of New Testament texts requires more elaborate (some may say more convoluted) exegesis: "twisting and turning, impaled on intransigent texts," in Van Inwagen's own self-deprecating words. For example, Jesus's parable of the "Rich Man" and his words to the "Good Thief" on the cross ("Today you shall be with me in Paradise."). Moreover, Paul's repeated representation of death as "sleep" cannot be discounted.

An important philosophical argument for Christian dualism, Van Inwagen says, is that the doctrine of the Resurrection of the Dead seems to presuppose dualism. "For if I am not something immaterial, if I am a living animal, then death must be the end of me. If I am a living animal, then I am a material object. If I am a material object, then I am the mereological sum of certain atoms. But if I am the mereological sum of certain atoms today, it is clear from what we know about the metabolisms of living things that I was not the sum of those same atoms a year ago" (Van Inwagen, 1995).

For the materialist who believes in the biblical resurrection of the dead as a literal future event, as Van Inwagen does, the fact that the atoms of which we are composed are in continuous flux is a "stumbling block." He asks, "How shall even omnipotence bring me back—me, whose former atoms are now spread pretty evenly throughout the biosphere?" This question does not confront the dualist, who will say that there is no need to bring me back because I have never left. But what shall the materialist say?" (Van Inwagen, 1995).

Van Inwagen challenges Divine power: "For what can even omnipotence do but *reassemble*? What else is there to do? And reassembly is not enough, for I have been composed of different atoms at different times." This leads to the conundrum of myriad duplicates.

In the end, Van Inwagen concludes, "there would seem to be no way around the following requirement: if I am a material thing, then, if a man who lives at some time in the future is to be I, there will have to be some sort of material and causal continuity between this matter that composes me now and the matter that will then compose that man." Van Inwagen finds this requirement looking very much like Paul's description of the resurrection: "when I die, the power of God will somehow preserve something of my present being, a *gumnos kókkos* [bare/naked grain/kernel[35]], which will continue to exist throughout the interval between my death and my resurrection and will, at the general resurrection, be

[35] *Gumnos kókkos* [bare/naked grain/kernel] comes from 1 Corinthians 15:37, referring to how on Earth God could resurrect the dead. Here, in context: 1 Corinthians 15:35–38, King James Version—"But some man will say, 'How are the dead raised up? And with what body do they come?' Thou fool, that which thou sowest is not quickened, except it die: And that which thou sowest, thou sowest not that body that shall be, but bare [naked] grain, it may chance of wheat, or of some other grain: But God giveth it a body as it hath pleased him, and to every seed his own body."

clothed in a festal garment of new flesh" (Van Inwagen, 1995).

While van Inwagen would be the first to admit that "oddly enough," few Christian dualists have been persuaded by his arguments against a Christian immortal soul, I (for one) consider his arguments probative, disruptive, insightful (if not dispositive) (Van Inwagen, 2007b).

10.4. Nagasawa's nontheoretical physicalism

Philosopher Yujin Nagasawa interrelates central debates in philosophy of mind (phenomenal consciousness) and philosophy of religion (existence of God) to construct a unique metaphysical thesis, which he calls "nontheoretical physicalism," by which he claims that although this world is entirely physical, there are physical facts that cannot be captured even by complete theories of the physical sciences (Nagasawa, 2008). This is no defense of traditional Non-Reductive Physicalism, but it is consistent with some of its distinguishing features.

Nagasawa's unique methodology, moving from epistemology to ontology, draws heretofore unrecognized parallels between fundamental arguments in philosophy of mind and philosophy of religion, using in the former the Knowledge Argument that Mary cannot know what it is like to see color in her black-and-white room, and in the latter atheistic arguments that God cannot know what it is like to be evil or limited due to his perfections. From what Nagasawa takes as the failures of traditional arguments against physicalism, yet in still rejecting a physicalist approach to phenomenal consciousness, he constructs his "nontheoretical physicalism" (Nagasawa, 2023).

What Nagasawa means by "nontheoretical" is an explanation of physicalism that is entity-based, not theory-based, which is consistent with his view that even with complete and final physical theories all reality cannot be explained (Nagasawa, 2008).

10.5. Sanfey's Abstract Realism

Medical doctor John Sanfey's Abstract Realism (AR) claims to bridge the mind-matter explanatory gap with two arguments suggesting a complementarity between first and third-person perspectives, with each perspective containing an equivalent observer function. The first argument posits that science must use abstract devices integrating past and future moments of continuous time that reflect first-person perception. The second argument tackles the hard problem by examining phenomenal simultaneity, where no time separates experiencer from experienced (Sanfey, 2023).

In "something it is like to experience redness," the experiencer knows they are not simultaneously causing the redness; one cannot consciously cause something without being conscious of doing so, obviously. But an intelligent system not experiencing conscious presence cannot be certain it is not causing what it perceives because its observing self must reside in the same physical systems that may or may not be producing illusions. This suggests, to Sanfey, that experiencing presence is sufficient to create logical possibilities such as disembodied mind or idealism. Rooted in phenomenal simultaneity, these causal mechanics of consciousness are unobservable in principle, he says, making consciousness indistinguishable from strong emergence. Proven causal power means that consciousness can be produced by physical systems even synthetic ones without introducing new physics. (In Sanfey's AR, the brain generates consciousness when two information systems, two electromagnetic fields [9.3], interact bi-directionally, causally, and with sufficient complexity such that one is the observing reference for the other.) (Sanfey, 2023).

Simultaneous causation cannot happen, but experiential simultaneity is certain, and with causal power, consciousness can be integrated with physics within a Non-Reductive Physicalism paradigm—without appealing to psycho-identity, panpsychism, idealism, or reductive physicalism. Matter, defined as that which behaves according to physical laws independently of conscious mind, is always either a sensory or conceptual model, a complementarity of first and third-person perspectives, each containing an equivalent observer function (Sanfey, 2023).

10.6. Northoff's non-reductive neurophilosophy

Northoff frames his views on consciousness (1.2.12) as "non-reductive neurophilosophy," which, he says, is "primarily a methodological approach," a particular strategy that takes into account "certain phenomena which otherwise would remain outside our scope [consciousness studies]." He deems "the link of conceptual models and ontological theories with empirical data to be key in providing insight into brain-mind connection and its subjectivity" (Northoff, 2022).

Paraphrasing Kant, Northoff says that "brain data without brain-mind models are blind, brain-mind models without brain data are empty." Thus, Northoff has non-reductive neurophilosophy allowing for "a systematic and bilateral connection of theoretical concepts and empirical data, of philosophy and neuroscience." His emphasis is on "systematic," by providing and defining "different steps in how to link concepts and facts in a valid way without reducing the one to the respective other." Taken in such sense, Northoff considers non-reductive neurophilosophy "a methodological strategy of analyzing the relationship of concepts and facts just like there are specific methods of logical analyses in philosophy and empirical data analysis in neuroscience." In other words, "non-reductive neurophilosophy is a methodological tool at the interface of philosophy and neuroscience. As such it can be applied to problems in both philosophy and neuroscience" (Northoff, 2022).

11. Quantum theories

Quantum theories of consciousness take seriously the idea that quantum mechanics plays a necessary, if not sufficient role, in the specific generation of phenomenal consciousness in certain physical entities like brains—beyond the general application of quantum mechanics in all physical entities. The kinds of quantum theories or models on offer differ radically.

Philosopher of science Paavo Pylkkänen explores whether the dynamical and holistic features of conscious experience might reflect "the dynamic and holistic quantum physical processes associated with the brain that may underlie (and make possible) the more mechanistic neurophysiological processes that contemporary cognitive neuroscience is measuring." If so, he says, "these macroscopic processes would be a kind of shadow, or amplification of the results of quantum processes at a deeper (pre-spatial or 'implicate') level where our minds and conscious experience essentially live and unfold." At the very least, Pylkkänen says, "a quantum perspective will help a 'classical' consciousness theorist to become better aware of some of the hidden assumptions in his or her approach." What quantum theory is all about, he stresses, is "learning, on the basis of scientific experiments, to question the 'obvious' truths about the nature of the physical world and to come up with more coherent alternatives" (Pylkkänen, 2018).

There is certainly growing interest in the putative quantum-consciousness nexus. For example, *Quantum and Consciousness Revisited*, with papers the product of two conferences, present various philosophical approaches to quantum paradoxes including further considerations of the Copenhagen Interpretation and alternatives with implications for consciousness studies, mathematics and biology. Topics include observation and measurement; collapse of the wave function; and time and gravity. All the papers, the editors write, "reopen the questions of consciousness and meaning which occupied the minds of the early thinkers of quantum physics" (Kafatos et al., 2024).

In his technical review article, "Quantum Approaches to Consciousness," theoretical physicist Harald Atmanspacher describes three basic approaches to the question of whether quantum theory can help understand consciousness: (1) consciousness as manifestation of quantum processes in the brain, (2) quantum concepts elucidating

consciousness without referring to brain activity, and (3) matter and consciousness as dual aspects of one underlying reality (Atmanspacher, 2020a).

For example, one approach considers how quantum field theory can describe why and how classical behavior emerges at the level of brain activity. The relevant brain states themselves are properly considered as classical states. The idea, Atmanspacher says, is "similar to a classical thermodynamical description arising from quantum statistical mechanics," and works "to identify different regimes of stable behavior (phases, attractors) and transitions between them. This way, quantum field theory provides formal elements from which a standard classical description of brain activity can be inferred" (Atmanspacher, 2020a).

Atmanspacher reports applications of quantum concepts to mental processes, focusing on complementarity, entanglement, dispersive states, and non-Boolean logic. These involve quantum-inspired concepts to address purely mental (psychological or cognitive) phenomena, without claiming that actual quantum mechanics is necessary to make it work. This includes research groups studying quantum ideas in cognition (Patra, 2019). While the term "quantum cognition" has gained acceptance, Atmanspacher says that a more appropriate characterization would be "non-commutative structures in cognition," and he questions whether it is "necessarily true that quantum features in psychology imply quantum physics in the brain?" (Atmanspacher, 2020a).

After reviewing major quantum theories of consciousness (several are discussed below), Atmanspacher suggests that progress is more likely made by investigating "mental quantum features without focusing on associated brain activity" (at least to begin with). Ultimately, he says, "mind-matter entanglement is conceived as the hypothetical origin of mind-matter correlations. This exhibits the highly speculative picture of a fundamentally holistic, psychophysically neutral level of reality from which correlated mental and material domains emerge" (Atmanspacher's Dual-Aspect Monism, 14.7.).

To position quantum theories of consciousness, consider each as representing one of two forms: (i) quantum processes, similar to those in diverse areas of biology (e.g., photosynthesis), that uniquely empower or enable the special activities of cells, primarily neurons, to generate consciousness; and (ii) the more radical claim that these two great mysteries, consciousness and quantum theory, are intimately connected such that the solution to both mysteries can be solved only together.

Physicist Carlo Rovelli disagrees. Consciousness and quantum mechanics, he says, have no special, intimate relationship. With respect to quantum mechanics, Rovelli says, "Consciousness never played a role … except for some fringe speculations that I do not believe have any solid ground. The notion of 'observer' should not be misunderstood. In quantum physics parlance an 'observer' can be a detector, a screen, or even a stone. Anything that is affected by a process. It does not need to be conscious, or human, or living, or anything of the sort" (Rovelli, 2022).

Philosopher of physics David Wallace sees "potentially intriguing connections between consciousness and quantum mechanics, tied partly to the idea that traditional formulations of quantum mechanics seem to give a role to measurement or observation—and, well, what is that?" He says, "the natural hypothesis is that measurement or observation is conscious perception," which somehow implies "a role of a conscious observer." Although this would be "extremely suggestive for connecting the two"—consciousness and quantum mechanics—"but you can connect them in a lot of ways." Some, Wallace says, might try to explain consciousness reductionistically in terms of quantum mechanical processes. But, "In my view, that works no better than explaining consciousness in terms of classical processes." However, "Another way is not try to reduce consciousness, but find roles for consciousness in quantum mechanics. That's one of the big questions about consciousness. What does it do? What is it here for? How can it affect the physical world? So, I'm at least taking seriously the idea that maybe consciousness plays a potential role in quantum mechanics. It's a version of the traditional idea that consciousness collapses the wave function. It's not an especially popular idea among physicists these days, partly because it takes consciousness as fundamental—but if, like me, you think there are independent reasons to do that, then I think it's an avenue worth looking at" (Wallace, 2016b).

Chalmers and McQueen readdress the question of whether consciousness collapses the quantum wave function. Noting that this idea was taken seriously by John von Neumann and Eugene Wigner but is now widely dismissed, they develop the idea by combining a mathematical theory of consciousness (Integrated Information Theory, 12) with an account of quantum collapse dynamics (continuous spontaneous localization). In principle, versions of the theory can be tested by experiments with quantum computers. The upshot is not that consciousness-collapse interpretations are clearly correct, but that there is a research program here worth exploring (Chalmers and McQueen, 2022).

Physicist Tim Palmer argues that our ability for counterfactual thinking—the existence of alternative worlds where things happen differently—which is both an exercise in imagination and a key prediction of quantum mechanics—suggests that "our brains are able to ponder how things could have been because in essence they are quantum computers, accessing information from alternative worlds" (he recruits the Many Worlds Interpretation of quantum mechanics). Consciousness (along with understanding and free will), he states, "involves appealing to counterfactual worlds" and thus "quantum computing is the key to consciousness" (Palmer, 2023).

At the very least, for quantum processing to play a content or informational role in the brain it would require some mechanism that stores and transports quantum information in qubits for sufficiently long, macroscopic times. Moreover, the mechanism would need to entangle vast numbers of qubits, and then that entanglement would need to be translated into higher-level chemistry in order to influence how neurons trigger action potentials (Ouellette, 2016). Experiments with anesthetics and brain organoids hint that quantum effects in the brain may be in some way involved in consciousness (Musser, 2024).

Although most physicists and neuroscientists have not taken quantum theories of consciousness seriously, such theories are proliferating, becoming more sophisticated and mainstream, and are increasingly backed up by claims of experimental evidence. Personally, I started out an incorrigible, utter skeptic about quantum consciousness; I'm still a skeptic, though no longer so incorrigible, no longer so utter.

11.1. *Penrose-Hameroff's orchestrated objective reduction*

Penrose-Hameroff's quantum consciousness, which they call Orchestrated Objective Reduction (OrchOR), is the claim that consciousness arises in the fundamental gap between the quantum and classical worlds. Formulated by mathematician and Nobel laureate Roger Penrose (Penrose, 2014; 1996; Penrose, 2014, 2023), and developed by anesthesiologist Stuart Hameroff (Hameroff, 2014a, 2014b), consciousness is non-computational, yet still explained by the physics of neurons, but a physics distinct from and broader than that which we currently understand.

Penrose claims that only a non-computational physical process could explain consciousness. He is not saying that consciousness is beyond physics, rather that it is beyond today's physics. "Conscious thinking can't be described entirely by the physics that we know," Penrose said, explaining that he "needed something that had a hope of being non-computational."[36] He focuses on "the main gap in physics": the contradiction between the continuous, probabilistic evolution given by the Schrödinger equation in quantum mechanics and the discrete, deterministic events when you make measurements in classical

[36] Quotes from Penrose and Hameroff come from their *Closer To Truth* videos: Roger Penrose—https://closertotruth.com/contributor/roger-penrose/; Stuart Hameroff—https://closertotruth.com/contributor/stuart-hameroff/.

physics—"how rules like Schrödinger's cat being dead and alive at the same time in quantum mechanics do not apply at the classical level" (Penrose, 2014, 2023),

Penrose argues that the missing physics that describes how the quantum world becomes the classical world "is the only place where you could have non-computational activity." But he admits that it's "a tall order" to sustain quantum information in the hot, wet brain, because "whenever quantum systems become entangled with the environment, 'environmental decoherence' occurs and information is lost."

"Quantum mechanics acting incoherently is not useful [to account for consciousness]," Penrose explains; "it has to act coherently. That's why we call [our mechanism] 'Orch OR', or 'orchestrated objective reduction'—the 'OR' stands for objective reduction, which is where the quantum state collapses to one alternative or another, and 'Orch' stands for orchestrated. The whole system must be orchestrated, or organized, in some global way, so that the different reductions of the states actually do make a big difference to what happens to the network of neurons" (Penrose, 2014, 2023),

So how can the hot, wet brain operate a quantum information system? Hameroff proposed a biological mechanism utilizing microtubules in neurons. As an anesthesiologist who had shepherded thousands of conscious-unconscious-conscious transitions, Hameroff, together with Penrose, developed their quantum theory of consciousness.

"Objective reduction in the quantum world is occurring everywhere," Hameroff recognizes, "so proto-conscious, undifferentiated moments are ubiquitous in the universe. Now in our view when orchestrated objective reduction occurs in neuronal microtubules, the process gives rise to rich conscious experience" (Hameroff, 2014b).

In Hameroff's telling, microtubules are cylindrical polymers of the protein tubulin capable of information processing, with fundamental units being states of a billion tubulins per neuron. Microtubules in all cells enact purposeful spatiotemporal activities, and in the brain, microtubules establish neuronal shape, create and regulate synapses, and are proposed to underlie memory, cognition and consciousness. Tubulin is the brain's most prevalent protein, so the brain is largely made of microtubules, each with unique, high frequency vibrational and quantum properties from non-polar aromatic ring pathways. The claim is made that experimental evidence shows that anti-depressants, psychedelics and general anesthetics, which selectively alter or block consciousness, all act via microtubules (Brophy and Hameroff, 2023).

Some evidence suggests that entangled states can be maintained in noisy open quantum systems at high temperature and far from thermal equilibrium—for example, counterbalancing decoherence by a "recoherence" mechanism—such that, "under particular circumstances, entanglement may persist even in hot and noisy environments such as the brain" (Atmanspacher, 2020a). Moreover, Anirban Bandyopadhyay describes experiments with the tubulin protein in microtubules where conductivity resistance becomes so low it's almost a macroscopic quantum-like system (Bandyopadhyay, 2014).

Penrose's ontology requires basic conscious acts to be linked to gravitation-mediated reductions of quantum states, with "real quantum jumps" related to conscious thoughts and, by extension, to neural correlates of consciousness. A complete theory seems to require a robust theory of quantum gravity, long the holy grail of physics.

As noted, the Orch OR theory proposes that consciousness arises from orchestrated (Orch) quantum state objective reductions (OR) in microtubules within brain neurons, which connect, adherents say, to the fine-scale structure of spacetime geometry. Adherents posit that Orch OR accounts for cognitive binding, real-time conscious causal action (through non-computable Penrose OR and retroactivity), memory encoding, and, ambitiously, the hard problem of phenomenal experience. Moreover, consciousness as a non-local quantum process in spacetime geometry provides potentially plausible mechanism for near-death and out-of-body experiences, pre-cognition, afterlife and reincarnation (Brophy and Hameroff, 2023). Quite the claim, that.

Hameroff makes the striking statement that "consciousness came before life." Based on observations of extraterrestrial organic material, in context of the Penrose-Hameroff quantum theory of consciousness, Hameroff challenges the conventional wisdom that consciousness evolved after life, posing that "consciousness may have been what made evolution and life possible in the first place" (Hameroff et al., 2024).

For years, Penrose-Hameroff stood largely alone, defending their quantum consciousness model against waves of scientific critics (Baars and Edelman, 2012), some of whom largely dismissed the notion as fanciful and fringy. Then, as quantum biology began emerging as a real science with broad applications—with quantum mechanisms shown to play essential roles in photosynthesis, vision, olfaction, mitochondria, DNA mutations, magnetoreception, etc.—a larger community began taking quantum consciousness more seriously.

Today, while Penrose-Hameroff Orch OR remains the most well-known quantum theory of consciousness, with increasing interest, there are other, diverse theories of how quantum processes are essential in consciousness. Their numbers are growing.

11.2. Stapp's collapsing the wave function via asking "questions"

Mathematical physicist Henry Stapp argues for the quantum nature of consciousness by relying on a traditional interpretation of quantum mechanics, where quantum wave functions collapse only when they interact with consciousness in an act of measurement. He envisions a "mind-like" wave-function collapse that exploits quantum effects in the synapses between neurons, generating consciousness, which he believes is fundamental to the universe (Stapp, 2011, 2023, 2007.)

Stapp founds his theory on the transition from the classical-physics conception of reality to von Neumann's application of the principles of quantum physics to our conscious brains (Stapp, 2006; Von Neumann, 1955/1932). Von Neumann extended quantum theory to incorporate the devices and the brain/body of the observers into physical theory, leaving out only the stream of conscious experiences of the agents. According to von Neumann's formulation, "the part of the physically described system being directly acted upon by a psychologically described 'observer' is the brain of that observer" (Stapp, 2011).

The quantum jump of the state of an observer's brain to the 'Yes' basis state (vector) then becomes the representation, in the state of that brain, of the conscious acquisition of the knowledge associated with that answer 'Yes,' which constitutes the neural correlate of that person's conscious experience. This fixes the essential quantum link between consciousness and neuroscience (Stapp, 2006).

To Stapp, this is the key point. "Quantum physics is built around 'events' that have both physical and phenomenal aspects. The events are physical because they are represented in the physical/mathematical description by a 'quantum jump' to one or another of the basis state vectors defined by the agent/observer's choice of what question to ask. If the resulting event is such that the 'Yes' feedback experience occurs then this event 'collapses' the prior physical state to a new physical state compatible with that phenomenal experience" (Stapp, 2006).

Thus, in Stapp's telling, mind and matter thereby become dynamically linked in a way that is causally tied to an agent's free choice of how to act. "A causal dynamical connection is established between (1) a person's conscious choices of how to act, (2) that person's consciously experienced increments in knowledge, and (3) the physical actualizations of the neural correlates of the experienced increments in knowledge" (Stapp, 2006).

More colloquially, Stapp argues that given the perspective of classical physics, where all is mechanical, where the physical universe is a closed system, "there's nothing for consciousness to do … and so it must be some sort of an illusion." Why would there have been consciousness at all, he asks? Under classical physics, "consciousness is just sitting there inert, a passive observer of the scene in which it has no function; it does nothing. So, it's a mystery why consciousness should ever come into existence" (Stapp, 2007).

In stark contrast, Stapp says, the way quantum mechanics works, in

order to get consequences, predictions, there must be a question posed. It's like "20 questions," yes-or-no questions. A question is posed in the quantum mechanical scheme; then there is an evolution according to the Schrodinger equation, and then nature gives an answer (which is statistically determined).

The axial idea, Stapp says, is that there is nothing in quantum mechanics that determines what decides the questions. This means that there's a gap, a critical causal gap in quantum mechanics. And the way it's filled in practice is that an observer, on the basis of reasons or motivations or with rules, sets up a certain experiment in a certain way. For example, putting a Geiger counter or some other detector in the path of particles.

This yields Stapp's concept of quantum consciousness. Nobody denies that thoughts exist, he says, but how do they do something? And that's the place where quantum consciousness has causal impact.

The crux of quantum mechanics is what questions are going to be asked. There is nothing in classical physics that asks such questions. But in quantum mechanics questions are answered by the psychological process of the experimenter, who is interested in learning something. And because there is nothing in the way quantum mechanics works that explains the choice of the question, there is an opening for the injection of mental events into the flow of physical events. The choice of the question is not determined by the laws as we know them (Stapp, 2007).

This means we need another process, which is consciousness. And this gives consciousness an actual role to play and allows it to do things causally. And if consciousness can act causally and do things, Stapp says, then classic materialism is out.

Niels Bohr had a famous quote: "one must never forget that in the drama of existence we are ourselves both actors and spectators." In the classical worldview, Stapp says, "we were just spectators; always we would just watch what's happening but couldn't do anything. In the quantum mechanical worldview, we are actors. We are needed to make the theory work."

Moreover, Stapp says, "this mental process cannot just be the product of the brain, because the brain, like all physical things, evolves via quantum mechanical rules. While quantum mechanics describes the evolution of potentialities for events to happen, that's all they describe, only potentialities—they do not describe what chooses the events that are going to happen, the actual events. Something must ask the questions, something outside of quantum mechanics—quantum mechanics forces that process." The only candidate, Stapp says, must be the independent existence of consciousness (Stapp, 2007).

Stapp's conclusions are as bold as they are controversial. First, the ontological foundations of consciousness and quantum mechanics are inextricably linked. Second, classical materialism is defeated (Stapp, 2007).

Philosopher of physics David Wallace is sympathetic with the idea that consciousness with respect to quantum physics has to be taken somehow as fundamental and irreducible, but there are two different ways that could go. "There's the dualist way, where you have physics and you have consciousness as two separate things, and there's the panpsychist idea, where consciousness underlies all of physics and is present at the most fundamental level of every physical process. Those are two different ideas" (Wallace, 2016a, 2016b).

When Wallace thinks about consciousness collapsing the wave function, as in quantum mechanics, he says, "That's the dualist half of my head. You've got physics, you've got a wave function, and you've got consciousness, which is observing the wave function. And somehow consciousness is something distinct from the physical wave function and every now and then affecting it in this interesting phenomenon of collapse. In a way, it's an updated version of Rene Descartes's dualism: there's mind and then there's body; they're separate and they interact."

Wallace says one could try to combine dualism and panpsychism with respect to the relationship between consciousness and quantum mechanics, "but I don't think they'd combine all that well," he said. "If consciousness is everywhere and consciousness collapses the wave function, then the wave function would be constantly collapsing and we know that doesn't happen because you get interference effects in double slit experiments. So, I think these two ideas, panpsychism and consciousness collapsing the wave function, should be pursued on separate tracks (Wallace, 2016a; 2016b; 2016c.)

11.3. Bohm's implicate-explicate order

Quantum physicist David Bohm, colleague of Einstein, famously introduced the idea of "implicate order" and "explicate order" as ontological implications of quantum theory to explain two radically opposed perspectives of the same phenomenon—something seems to be needed to account for the bizarrely divergent ways of conceiving reality, quantum and classical, both of which seemed undeniably correct.

Bohm is a big thinker, leveraging the counterintuitive concepts of quantum mechanics to try to see reality as it really is. He envisions matter and mind as intertwined. He worked with Karl Pribram to develop "Holonomic Brain Theory" (9.4.5). He explored the essence of thought with Indian philosopher Jiddu Krishnamurti. Of particular import is what he calls "undivided wholeness," meaning that the subject actively participates with the object, rather than being a detached observer. Bohm developed his "wholeness" as innately dynamic, alive, and open-ended (Gomez-Marin, 2023a).

According to Bohm, everything is in a state of process or becoming (folding and unfolding)—Bohm calls it the "universal flux". All is dynamic interconnected process. In the same manner, Bohm says, "knowledge, too, is a process, an abstraction from the one total flux, which latter is therefore the ground both of reality and of knowledge of this reality" (Section: Bohm, 1980; Bohm, *Wise Insights Forum*, website).

Now, regarding "implicate order," Bohm means "order which is enfolded (the root meaning of 'implicate') and later unfolded or made explicate." Relating the enfolding-unfolding universe to consciousness, Bohm contrasts mechanistic order with implicate order. In mechanistic order, which is inherent to classical physics, "the principal feature of this order is that the world is regarded as constituted of entities which are *outside of each other*, in the sense that they exist independently in different regions of space (and time) and interact through forces that do not bring about any changes in their essential natures. The machine gives a typical illustration of such a system of order …. By contrast, in a living organism, for example, each part grows in the context of the whole, so that it does not exist independently, nor can it be said that it merely 'interacts' with the others, without itself being essentially affected in this relationship" (Bohm, 1980; Bohm, n.d.).

Bohm contends, "the implicate order applies both to matter (living and non-living) and to consciousness, and that it can therefore make possible an understanding of the general relationship between these two"—yet he recognizes "the very great difference in their basic qualities." Still, he believes that because both consciousness and matter are extensions of the implicate order, a connection is possible.

To Bohm, the explicate order, which is "the order that we commonly contact in common experience," has room "for something like memory", with the fact that "memories are first enfolded and then unfolded during recall" being consistent with Bohm's concepts of implicate and explicate order. "Everything emerges from and returns to the Whole" (Bohm, n.d.).

Confirming his non-materialist status, Bohm proposes, "the more comprehensive, deeper, and more inward actuality is neither mind nor body but rather a yet higher-dimensional actuality, which is their common ground and which is of a nature beyond both." What we experience consciously, Bohm offers, is a projection of a higher-dimensional reality onto our lower-dimensional elements. "In the higher-dimensional ground the implicate order prevails," he says. "Thus, within this ground, *what is* is movement which is represented in thought as the co-presence of many phases of the implicate order …. We do not say that mind and body causally affect each other, but rather that the movements of both are the outcome of related projections of a common

higher-dimensional ground" (Bohm, 1980; Bohm, n.d.).

11.4. Pylkkänen's quantum potential energy and active information

Philosopher Paavo Pylkkänen proposes a view in which "the mechanistic framework of classical physics and neuroscience is complemented by a more holistic underlying framework in which conscious experience finds its place more naturally" (Pylkkänen, 2007). Recognizing that it is "very likely that some radically new ideas are required if we are to make any progress" on the hard problem, he turns to quantum theory "to understand the place of mind and conscious experience in nature." In particular, Pylkkänen and physicist Basil Hiley focus on the ontological interpretation of quantum theory proposed by David Bohm and Hiley (1993) and make "the radical proposal that quantum reality includes a new type of potential energy which contains active information. This proposal, if correct, constitutes a major change in our notion of matter" (Hiley and Pylkkänen, 2022).

Pylkkänen and Hiley's intuition is that the reason "it is not possible to understand how and why physical processes can give rise to consciousness is partly the result of our assuming that physical processes (including neurophysiological processes) are always mechanical." However, they say, if "we are willing to change our view of physical reality by allowing non-mechanical, organic and holistic concepts such as active information to play a fundamental role," this might make it possible to understand the relationship between physical and mental processes in a new way (Hiley and Pylkkänen, 2022). For example, the human brain could operate in some ways like a "quantum measuring apparatus" (Pylkkänen, 2022).

Philosophically, according to Pylkkänen, that the physical domain is causally closed has left "no room for mental states qua mental to have a causal influence upon the physical domain, leading to epiphenomenalism and the problem of mental causation." One road to a possible solution is called "causal antifundamentalism:" causal notions cannot play a role in physics, because the fundamental laws of physics are radically different from causal laws." While "causal antifundamentalism seems to challenge the received view in physicalist philosophy of mind and thus raises the possibility of there being genuine mental causation after all," Pylkkänen rejects it in favor of the ontological interpretation of quantum theory imparting active information (Pylkkänen, 2019).

11.5. Wolfram's consciousness in the ruliad

Physicist and computer scientist Stephen Wolfram seeks "to formalize issues about consciousness, and to turn questions about consciousness into what amounts to concrete questions about mathematics, computation, logic or whatever that can be formally and rigorously explored" (Wolfram, 2021b). He begins by embedding consciousness in what he calls the "ruliad" (neologism from "rules"), which he defines as "the entangled limit of everything that is computationally possible: the result of following all possible computational rules in all possible ways." The ruliad, he says, is "a kind of ultimate limit of all abstraction and generalization," encapsulating "not only all formal possibilities but also everything about our physical universe" (Wolfram, 2021a). The ruliad is crucial for formalizing the "rules" of consciousness, he argues, because "everything we experience can be thought of as sampling that part of the ruliad that corresponds to our particular way of perceiving and interpreting the universe" (Wolfram, 2021b).

Consciousness, Wolfram says, is not about the general computation that brains can do. "It's about the particular feature of our brains that causes us to have a coherent thread of experience." And this invokes the ruliad, which "has deep consequences that far transcend the details of brains or biology." It defines (what we consider to be) the laws of physics (Wolfram, 2021b).

While consciousness involves computational sophistication, Wolfram says, "its essence is not so much about what can happen as about having ways to integrate what's happening to make it somehow coherent and to allow what we might see as 'definite thoughts' to be formed about it." Surprisingly, "rather than consciousness being somehow beyond 'generalized intelligence' or general computational sophistication," he instead sees consciousness "as a kind of 'step down'—as something associated with simplified descriptions of the universe based on using only bounded amounts of computation." In addition, "for our particular version of consciousness, the idea of sequentialization seems to be central" (Wolfram, 2021b).

Wolfram probes consciousness by asking, "Why can't one human consciousness 'get inside' another?" It's not just a matter of separation in physical space, he says, "It's also that the different consciousnesses—in particular by virtue of their different histories—are inevitably at different locations in rulial space. In principle they could be brought together; but this would require not just motion in physical space, but also motion in rulial space" (Wolfram, 2021a).

Quantum mechanics is involved in Wolfram's consciousness, but with more than its usual putative mechanisms. Considering the foundations of quantum mechanics in context of the ruliad—quantum mechanics emerges "as a result of trying to form a coherent perception of the universe"—Wolfram offers a sharp epigram to describe consciousness: "*how branching brains perceive a branching universe*" (Wolfram, 2021b).

To Wolfram, to grasp the core notion of consciousness goes beyond explicating consciousness per se because it "is crucial to our whole way of seeing and describing the universe—and at a very fundamental level it's what makes the universe seem to us to have the kinds of laws and behavior it does." The richness of what we see, he says, reflects computational irreducibility, "but if we are to understand it we must find computational reducibility in it." This is how consciousness "might fundamentally relate to the computational reducibility we need for science, and might ultimately drive our actual scientific laws" (Wolfram, 2021a).

11.6. Beck-Eccles's quantum processes in the synapse

Sir John Eccles, Nobel laureate for his seminal work on the synapse, the small space between neurons across which neurochemicals flow to excite or inhibit contiguous neurons, was a pioneer in early efforts to construct a "quantum neurobiological" theory of consciousness. In their formulation, Beck and Eccles applied concrete quantum mechanical features to describe how, in the cerebral cortex, incoming nerve impulses cause the emission of transmitter molecules in presynaptic neurons (i.e., exocytosis) via information transfer and "quantal selection" with a direct relationship with consciousness (i.e., influenced by mental actions) (Beck and Eccles, 1992).

Beck and Eccles propose that "the quantum state reduction, or selection of amplitudes, offers a doorway for a new logic, the quantum logic, with its unpredictability for a single event." Because conscious action (e.g., intention) is a dynamical process which forms temporal patterns in relevant areas of the brain (cerebral cortex), they propose how regulating the myriad synaptic switches between innumerable neurons in those relevant areas can be regulated effectively by a quantum trigger (based on an electron transfer process in the synaptic membrane). Thus, they conclude, "conscious action is essentially related to quantum state reduction" (Beck and Eccles, 1998).

Stapp supports the hypothesis that quantum effects are important in brain dynamics in connection with cerebral exocytosis. Exocytosis is instigated by a neuronal action potential pulse that triggers an influx of calcium ions through ion channels into a nerve terminal, such that, due to the very small diameter of the ion channel, the quantum wave packet that describes the location of the ion spreads out to a size much larger than the trigger site. This means that "one must retain both the possibility that the ion activates the trigger, and exocytosis occurs, and also the possibility that the ion misses the trigger site, and exocytosis does not occur" (Stapp, 2006).

As Beck and Eccles hypothesize, "the mental intention (the volition) becomes neurally effective by momentarily increasing the probability of exocytosis in selected cortical areas" (Beck and Eccles, 1992). If so, this fundamental indeterminism of the nature of each specific quantum state collapse is said to open opportunity for mental powers to affect brain states, with supposed implications for conscious intervention and even for free will.

11.7. Kauffman's mind mediating possibles to actuals

Theoretical biologist Stuart Kauffman posits the following: (i) Quantum measurement converts Res potentia—ontologically real Possibles—into Res extensa - ontologically real Actuals. (ii) Brain/mind/consciousness cannot be purely classical physics because no classical system can be an analog computer whose dynamic behavior can be isomorphic to "possible uses", and therefore, brain/mind/consciousness must be partly quantum. (iii) Res potentia and Res extensa suggest a role for mind/consciousness in collapsing the wave function converting Possibles to Actuals, because no physical cause can convert a Possible into an Actual. (iv) Our brain/mind/consciousness entangles with the world in a vast superposition and we collapse the wave function to a single state which we experience as qualia, allowing "seeing" or "perceiving" of X to accomplish Y (Kauffman, 2019, 2023; Kauffman and Roli, 2022)[37]

As Kauffman and parapsychologist Dean Radin put it, "We propose a non-substance dualism theory, following a suggestion by Heisenberg (1958), whereby the world consists of both ontologically real Possibles that do not obey Aristotle's law of the excluded middle, and ontologically real Actuals, that do obey the law of the excluded middle." Measurement, they say, is what converts Possibles into Actuals" (Kauffman and Radin, 2020).

The "culprit" at the root of the mind-body problem, according to Kauffman and Radin, is the causal closure of classical physics. "We ask mind to act *causally* on the brain and body, but in classical physics all of the causes are already determined." Because of this, they conclude, no form of substance dualism can work while quantum mechanics as the foundational mechanism of consciousness should be taken seriously—which, they say, would lead to "the intriguing possibility that some aspects of mind are nonlocal, and that mind plays an active role in the physical world" (Kauffman and Radin, 2020). (9.)

11.8. Torday's cellular and cosmic consciousness

Developmental physiologist John Torday offers an original cellular-based explanation of consciousness that embeds quantum mechanics (Torday, 2022a, 2022b, 2023, 2024). He describes consciousness as a two-tiered-system, derivative from physiology, having been "constructed" from the environment via factors in the environment that have been assimilated via symbiogenesis and integrated as cell physiology—the cell semi-permeable membrane being the first tier, and the compartmentation and integration of cell physiologic data as cell-cell communication as the second tier. Basing his model on both classical Newtonian and quantum mechanical principles, he proposes that consciousness is stored within and between our cells based on control mechanisms, referencing the "First Principles of Physiology", that is, negative entropy, chemiosmosis and homeostasis, and consciousness is retrieved from them via the central nervous system as the "algorithm" for translating local and non-local cellular physiologic memories into thought (Torday, 2022a).

He claims that quantum entanglement is integral to our physiology, and that it links our local consciousness with the non-local consciousness of the cosmos, distinguishing causation from coincidence based on science. Moreover, he posits that local physiologic memories are paired with non-local memories that dwell in cosmic consciousness and that all cellular memories are on a continuum of local and non-local properties, and that under certain conditions we may be more locally or non-locally conscious. He speculates that as we evolve, we move closer to the non-local by transcending the local. He maintains that we can take advantage of certain experiences in order to attain a transcendent level of consciousness: lucid dreaming, near-death experiences, out-of-body experiences, Maslow peak experiences, runner's high (Torday, 2022a).

Torday's main point is that "the quantum" is native to our physiology (Torday, 2022a, 2022b, 2023, 2024). Moreover, "since our physiology derives from the Cosmos based on Symbiogenesis," he hypothesizes that "the cell behaves like a functional Mobius Strip, having no 'inside or outside' cell membrane surface—it is continuous with the Cosmos, its history being codified from Quantum Entanglement to Newtonian Mechanics, affording the cell consciousness and unconsciousness-subconsciousness as a continuum for the first time" (Torday, 2024).

11.9. Smolin's causal theory of views

Physicist Lee Smolin approaches the question of how qualia fit into the physical world in the context of his "relational and realist completion of quantum theory, called the *causal theory of views*" (Smolin, 2020).

Smolin has long focused on a "realist" double completion of quantum mechanics and general relativity that would give a full description of, or explanation for, all individual physical processes, independent of our knowledge or interventions. Such a completion is required for unifying gravity, spacetime, and cosmology into the rest of physics. His common theme has been that of a relational "hidden variables" theory: a realist description of precisely what goes on in each individual event or process, which reduces to quantum mechanics in a certain limit and averaging procedure.

In Smolin's theory, the first key idea is that "the universe is constructed from nothing but a collection of views of events, where the view of an event is what can be known about that event's place in the universe from what can be seen from that event." In other words, "the beables of this theory ['beable' is short for 'maybe-able,' i.e., anything that could possibly be, in any superimposed quantum states] are views from events, the information available at each event from its causal past, such as its causal predecessors and the energy and momentum they transfer to the event." Smolin calls this the "view" of an event—that is, "a causal universe that is composed of a set of partial views of itself." Within such an ontology of views, Smolin says it's "natural to propose that instances or moments of conscious experience are aspects of some views. That is, an elementary unit of consciousness is not a single qualia, but the entire of a partial view of the universe, as seen from one event" (Smolin, 2020.)

Smolin's second key idea restricts the views that are associated with consciousness to within a very small set. Most events and their views are common and routine, he says, in that they have many near copies in the universe within their causal pasts. He proposes that these common and routine views have no conscious perceptions. Then, "there are a few, very rare views which are unprecedented, which are having their first instance, or are unique, in that they have no copies in universal history." Smolin proposes it is "those few views of events, which are unprecedented, and/or unique, and are hence novel, [i.e., they are not duplicates of the view of any event in the event's own causal past] which are the physical correlates of conscious perceptions."

This addresses, he says, "the problem of why consciousness always involves awareness of a bundled grouping of qualia that define a

[37] Kauffman says this new way of thinking about the mind-body problem differs from those of Descartes, Spinoza, Berkeley, and materialism. Res potentia and Res extensa are not substance dualism because "potentia" are not substances. But Res potentia and Res extensa are not Spinozian monism, a single substance with mental and physical properties. Nor are they Idealism, which has no Res extensa. Nor are they materialism, which has no Res potentia. Kauffman says he bases his way of thinking, in part, on Werner Heisenberg's ontological interpretation of the quantum state as "potentia."

momentary self. This gives a restricted form of panpsychism defined by a physically based selection principle which selects which views have experiential aspects."

To summarize, Smolin bases his theory on two concepts: First, the beables of a relational theory to be the views of events. Second, the possibility of making a physical distinction between common and routine states, on the one hand, and novel and unique states, on the other. "A relational theory that incorporates both ideas offers a possible setting for bringing qualia and consciousness into physics. The physical correlates of consciousness would be the novel or unique views of events" (Smolin, 2020.)

11.10. Carr's quantum theory, psi, mental space

Mathematician-astronomer Bernard Carr speculates that "mental space," an unknown aspect of reality, may be the ultimate foundation of consciousness. "Even if you believe that consciousness collapses the wave function," he says, "that doesn't really accommodate consciousness within physics. It's saying that quantum theory is weird and therefore maybe it can explain consciousness, which is also weird—but that is illogical because it's just explaining one mystery in terms of another. We need to get consciousness into physics in a more fundamental way" (Carr, 2016a).

Carr notes that most physicists take the view that "consciousness is just an epiphenomenon produced by the brain, independent of physics, and that as physicists they don't have to confront the problem of consciousness because, after all, physics has a third-person perspective, objects in the outside world, whereas consciousness has a first-person perspective. In other words, clearly brains exist and brains are physical systems, but consciousness is simply beyond the domain of physics. The real issue is how can physics ever accommodate that first-person perspective?" (Carr, 2016b).

Carr considers the radical view that "consciousness actually is more fundamental, that the brain's role is to limit your experience. So, when you see the world through your eyes and hear it through your ears, the brain is limiting your experience—which, on the face of it, might seem a completely bizarre thing to say, but that, at least, is an alternative view, that consciousness is not actually generated by the brain, but merely encounters the world through the brain" (Carr, 2016c).

"The only way I can see this," Carr poses, is a state of affairs "where consciousness is primary, a fundamental aspect of reality. In other words, consciousness is not just generated as a result, as the endpoint, of physical processes. In some sense, it's there from the beginning" (Carr, 2016c).

As to the relationship between consciousness and mathematics, Carr sees them "on a par because I feel that the final picture of the world must marry matter and mind. They come together. Which is primary? I'm not sure the question even makes sense, because I prefer a picture in which matter and mind co-exist right from the beginning." Carr is careful to clarify what he means by "mind." He says, "When I use the word 'mind' in this context, I'm using 'Mind' with an upper-case 'M', rather than mind with a lower-case 'm', which is generated by the brain. 'Mind' with a big 'M' is like consciousness with a big 'C'" (Carr, 2016c).

In forming his theory, Carr sees support from psi or the paranormal. While he recognizes that psi "encompasses a multitude of sins," there are some aspects, such as telepathy and clairvoyance, which he takes seriously, whereas other aspects, such as precognition and psychokinesis, less so. Still, he regards even these psi phenomena as possible because of potential deep interactions between consciousness and physics. Thus, psi is another reason why, he says, "We need a theory of physics that accommodates consciousness." (Carr stresses that he gives no credence to many aspects of psi or the paranormal.) (Carr, 2016d).

Carr's "favorite view," he says, is that "the way to explain this link between minds, and indeed between minds and the physical world, is to say that there is in some sense a 'bigger space' and this bigger space in some sense links your mind and my mind." He labels this bigger space "mental space." He says, "Just as there's a physical world that reconciles innumerable observations of the physical world, there is this 'mental space' that allows connections between different minds and between minds and the physical world—because, remember, the physical world is also part of this bigger space."

Carr offers another category of explanations for psi which involves quantum theory, where entanglement can connect spatially separated objects and events. "Maybe we're all entangled in some weird quantum mechanical way. Now, that's probably the view which is currently the most popular among parapsychologists." However, that's not Carr's own view. "As noted, my own favorite view is that there is this bigger space, this mental space, that in some sense links minds and perhaps matter as well."

Carr discerns the relationship between quantum theory and this mental space. "If you want consciousness to come into physics, quantum theory is going to play a role. All I'm saying is I don't think that quantum theory alone can explain all the phenomena. You need some form of mental space to accommodate these psi or paranormal phenomena (if you believe in these phenomena, of course, which most of my colleagues do not)." Carr stresses, rightly I think, that psi or paranormal phenomena are worth taking seriously (17), because even with a minimalist view that the probability of these phenomena being real is small, their significance for a final theory of physics would be huge" (Carr, 2016d).

11.11. Faggin's quantum information-based panpsychism

Physicist/inventor Federico Faggin postulates "with high confidence" that "consciousness and free will are properties of quantum systems in pure quantum states" because they depend on quantum entanglement, a nonlocal property that cannot exist in any classical, deterministic universe (Faggin, 2023). The kind of information involved in consciousness needs to be quantum for multiple reasons, he says, "including its intrinsic privacy and its power of building up thoughts by entangling qualia states." As a result, Faggin comes to a "quantum-information-based panpsychism" (QIP) (D'Ariano and Faggin, 2022).

The essence of QIP is that "a quantum system that is in a pure quantum state is conscious of its own state, that is, it has a qualia experience of its state." Faggin calls this "a highly plausible postulate" because "a qualia experience is definite (integrated, not made of a mixture of separable parts) and private since it can only be known by the experiencer."

More formally, the theory says that a quantum state is an effective mathematical representation of a conscious experience because it possesses the same crucial characteristics of what it represents: the definiteness and privacy of the experience. "Within QIP, quantum information describes the subjective inner reality of quantum systems, a reality that is private for each system" (Faggin, 2023).

But this mathematical description of an experience (a vector in Hilbert space), Faggin stresses, is *not* the experience itself. Quantum information is non-cloneable and thus can be only partially objectified with classical information. Moreover, "the nature of that private knowing is not numeric but *qualitative* and *subjective*, because a conscious system 'knows' its own state by feeling it through qualia."

Faggin says his hypothesis has creative possibilities, which are the foundation of imagination, intuition, vision, creativity, comprehension, and inventiveness, emerging "from the quantum level of reality, since a classical world is deterministic, that is, algorithmic and predictable, and thus incapable of real creativity." True creativity, Faggin says, like free will and consciousness, "are *non-algorithmic* properties that can only exist in a fundamental layer of the universe ruled by quantum physics." Because quantum consciousness is not reproducible, Faggin predicts that no machine can ever have it or create it (it is not reducible to mechanisms) and, he says, it could continue to exist after the death of the body (Faggin, 2023).

11.12. Fisher's quantum cognition

Condensed matter physicist Matthew Fisher proposes that quantum processing with nuclear spins might be operative in the brain and key to its functioning. He identifies "phosphorus as the unique biological element with a nuclear spin that can serve as a qubit for such putative quantum processing—*a neural qubit*—while the phosphate ion is the only possible *qubit-transporter*." He suggests the "Posner molecule" (calcium phosphate clusters, $Ca_9(PO_4)_6$) as "the unique molecule that can protect the neural qubits on very long times and thereby serve as a (working) *quantum-memory*" (Fisher, 2015).

To be functionally relevant in the brain, he says, "the dynamics and quantum entanglement of the phosphorus nuclear spins must be capable of modulating the excitability and signaling of neurons"—which he takes as a working definition of "quantum cognition". Phosphate uptake by neurons, he says, might provide the critical link.

Because quantum processing requires quantum entanglement, Fisher argues that "the enzyme catalyzed chemical reaction which breaks a pyrophosphate ion into two phosphate ions can quantum entangle pairs of qubits," and that "Posner molecules, formed by binding such phosphate pairs with extracellular calcium ions, will inherit the nuclear spin entanglement." Continuing the explanatory sequence, Fisher says "Quantum measurements can occur when a pair of Posner molecules chemically bind and subsequently melt, releasing a shower of intracellular calcium ions that can trigger further neurotransmitter release and enhance the probability of post-synaptic neuron firing. Multiple entangled Posner molecules, triggering non-local quantum correlations of neuron firing rates, would provide the key mechanism for neural quantum processing" (Fisher, 2015).

The possible centrality of quantum processing in the brain is supported by the emerging field of quantum biology. It can be called, "quantum neuroscience" (Ouellette, 2016). Fisher's proposal, even if incorrect in its specifics, is useful in identifying the kinds of processes and sequences of explanatory steps required if quantum processing is to be fundamental for brain function in general and for consciousness in particular.

11.13. Globus's quantum thermofield brain dynamics

Psychiatrist-philosopher Gordon Globus seeks to link two seemingly independent discourses: An application of quantum field theory to brain functioning, which he calls "quantum brain dynamics," and the continental postphenomenological tradition, especially the work of Martin Heidegger and Jacques Derrida. Underlying both, he says, "is a new ontology of non-Cartesian dual modes whose rich provenance is their between" (Globus 2003).

The key issue, in Globus's telling, is that of primary "closure"—the nonphenomenality of quantum physical reality—and the action that brings "dis-closure." Dis-closure of the phenomenal world, he argues, "can be understood within the framework of dissipative quantum thermofield brain dynamics without any reference to consciousness" (Globus, 2011). He posits to "deconstruct" the field of consciousness studies by combining "two persistently controversial areas: the hard problem of qualia and the measurement problem in quantum physics …. within the framework of dissipative quantum thermofield brain dynamics: disclosure." His claim is that "the problematics of consciousness/brain, qualia, and measurement in quantum physics are resolved by substituting disclosure for perceptual consciousness and distinguishing the phenomenal brain-p from the macroscopic quantum object brain-q" (Globus, 2013).

Metaphysically, Globus conceives the world as a "continual creation" on the part of each quantum thermofield brain in parallel, which is "triply tuned": by sensory input, memory and self-tuning. Such a brain, he says, "does not primarily process information—does not compute—but through its multiple tunability achieves an internal match in which a world is disclosed, even though there is no world out there, only objects under quantum description at microscopic, mesoscopic and macroscopic scales." Globus claims his "unconventional formulation revives a version of monadology via quantum brain theory" (Globus, 2022).

Globus decries how "philosophers have said some rather naive things by ignoring the extraordinary advances in the neurosciences in the 20th century. The skull is not filled with green cheese!" On the other hand, he criticizes "the arrogance of many scientists toward philosophy and their faith in the scientific method," which he calls "equally naïve," asserting that "scientists clearly have much to learn from philosophy as an intellectual discipline" (Globus, 2012).

11.14. Poznanski's dynamic organicity theory

Neuroscientist Roman Poznanski proposes a Dynamic Organicity Theory (DOT) of consciousness, a quantum biological theory based on a multiscale interpretation of type-B materialism.[38] DOT utilizes a multiscalar temporal-topological framework to include quantum biological effects in the sense of what happens to macroscopic systems upon interaction with quantum potential energy that exists when a living negentropic[39] state of the brain imposes thermodynamic constraints (Section: Poznanski, 2024).

DOT does not deal with quantum consciousness or assume quantum brain dynamics. However, according to Poznanski, a Schrödinger-like equation describes the quantum effects within the multiscale complexity, where multiscale complexity is both functional and structural through changeable boundary conditions (resulting in the topology being a holarchical modularity). This is made possible by treating time consciousness, i.e., "consciousness-in-the-moment," on a nonlinear temporal scale and implicitly grounding space to the contingency of changing boundary conditions. The approach is based on the *dynamics of functional relations* (not to be confused with functionalist or relational theories of consciousness). It is a nonspatial topological framework (not the mathematical study of "space" in a general sense of topological spaces) associated with the temporal aspect of the functionality. Here, functionality refers to the biological realization of the physical as those features of usefulness that exist subjectively. Therefore, Poznanski says, it rules out functionalism and focuses on the qualitativeness of brain functioning. As noted, the approach is type-B materialism (Chalmers, 2003), where consciousness is a physical process, but epistemic objectivism alone does not define physicalism (Shand, 2021). This means that functionality as the quality of usefulness only refers to physical properties assessed subjectively, which can be possible only through quantum biological effects.

Moreover, the functional capability of the negentropic state changing over time must satisfy the following necessary condition for consciousness to arise: the functionality of multiscale complexity must exceed the functionality of maximum complexity, i.e., $F_{MultiComplexity} > F_{MaxComplexity}$. This means that consciousness arises when the functionality of multiscale complexity reaches above the functionality of maximum complexity. This required increase in functionality of multiscale complexity is derived from an additional degree of freedom made possible by quantum biology[40] beyond that of the functionality of maximum complexity as derived from brain structure, dynamics, and function. $F_{MaxComplexity}$ is an insufficient measure of consciousness. $F_{MultiComplexity}$ provides an epistemically subjective approach to dynamic organicity, including self-referential dynamic pathways that give an

[38] A type-B materialist "accepts that there is an unclosable epistemic gap, but denies that there is an ontological gap" (Chalmers, 2003).

[39] "Negentropy" is a reduction in entropy and a corresponding increase in order.

[40] Quantum biology does not imply that quantum mechanics applies here. It is a classical-to-quantum analog approach, based on wave mechanics, that is sufficient to illustrate the process.

extra quality of energy-negentropy exchange for path selection as realization relations. $F_{MultiComplexity}$ is not a step-function but a gradual ascendance to plateaus accounting for different degrees of consciousness. (Whether this condition is sufficient is beyond DOT to decipher; something with an equivalent topology could cause consciousness in other systems.) (Poznanski, 2024).

Poznanski states that "the act of understanding uncertainty is the main qualifier of consciousness" and "the 'act' connotes the experienceable form, which is, in essence, a precursor of the experience of acting." The process entails the potential for understanding "meaning" through self-referential dynamical pathways "instead of recognizing (cf. introspection) sensory information through perceptual channels, forming the basis of understanding uncertainty without relying on memory recall." It is not, he says, "coming into existence" because "quantum-thermal fluctuations are irreducible, yet the process as a whole comes 'to exist' perhaps not instantaneously but appears spontaneously. Its output is intentionality as an instruction to act in path selection."

The self-reference principle, which Poznanski says can replace emergence and self-organization when dealing with functionality rather than structure, "establishes dynamical pathways from the microscale to the macroscale (this includes nonlocal pathways), in which diachronic causation and how the disunity of causal order in the redundancy creates a weak unity of consciousness through its temporal structure," the inferred purpose giving rise to "a sense of self."

Poznanski avoids discussing phenomenological properties of consciousness, such as qualia, because, he says, they do "not apply to conscious reality when considered in the context of functional-structural realism, an offshoot of structuralism, without relying on introspection." Phenomenological consciousness, he says, "appears like a black box of 'being' instead of 'doing.'" However, functional interactions that entail self-referential dynamics "are uniquely fathomed and, hence, not phenomenally equivalent in other functional systems."

Thus, Poznanski concludes, "a living negentropic state that supports biological function is a dynamic state of being organic representing an additional degree of freedom for intrinsic information to be structured, which makes it possible for a dynamic organicity theory of consciousness to take shape in the material brain" (Poznanski, 2024).

11.15. Quantum consciousness extensions

The following theories of consciousness are not quantum theories per se in that they do not have quantum mechanics as the essence or generator of consciousness. Rather, each reflects how quantum mechanics could facilitate or interact with other theories of consciousness. All are highly speculative.

Computer scientist Terry Bollinger enjoys speculating about possible mechanisms of quantum consciousness; these include, non-linear soliton Schrödinger wave models in sensory neural networks; neural dendrites as antennas for wave collapses; how warm brains might actively maintain and manipulate quantum wave functions; and how "quasiparticles" might enable quantum consciousness by quantizing classical data transfers between neurons (Bollinger, 2023).

Complexity theorist Sudip Patra posits that mathematical tools used in quantum science (information theory included) can be also used to describe cognition; for example, Hilbert space modeling of cognitive states might provide better descriptions of different features like contextuality in decision making, or even exploring 'entanglement-like' features of mental states (Patra, 2023; Rooney and Patra, 2022). Though Patra is agnostic about any underlying physics of consciousness, he works with Kauffman (11.7) to construct a non-local theory of consciousness outside the constraints of physical space-time.

New-age physician-author Deepak Chopra explains "the intricate relationship between consciousness and the quantum field" by applying the same word "field" to both. Consciousness isn't individual, he says. "Instead, it is a vast field that individuals share in. This field encompasses myriad possibilities. It is the source from which thoughts, sensations, images, and feelings emerge and then dissolve back into, just as subatomic particles do in the quantum field. Mental experiences and quanta are transient, shaped by uncertainty, and are, in essence, energetic fluctuations within the consciousness field." Chopra points to the infinite nature of the quantum and the consciousness fields, and to the essential entanglement within each, such that local realism—i.e., the world of isolated physical objects and mental thoughts—is "out the window" for both physical and mental phenomena. This entanglement, he says, "suggests that physical objects are intertwined with perception and consciousness, blurring the boundaries between the observer and the observed." Chopra proposes "a drastic paradigm shift" in which "consciousness comes first, being the field that is the origin of creation, acting in concert with the quantum field" (Chopra, 2023a,b).

Philosopher Emmanuel Ransford proposes "quantum panpsychism" where matter is richer "with an extra content or dimension"—he calls it "holomatter," composed of "holoparticles"—and consciousness is "a nonmaterial content of the world." It assumes two types of causality: "out-causation," causation from outside, out of reach and deterministic; and "in-causation," causation from within, unpredictable and "self-willed," a kind of randomness. Holoparticles, Ransford offers, also have two parts: one obvious, deterministic and out-causal; the other hidden, random-looking and in-causal. This hints, he says, that "the randomness of some quantum events is a smoking-gun evidence of in-causation." He adds the "im-im hypothesis," where "im-im" stands for *im*material and *im*manent, and his claimed insight is that the brain is a catalyst of the mind. "It is a biological 'lamp' of sorts that pours out untold sparks of consciousness instead of untold sparks of light (or photons) in the case of ordinary lamps." Indeed, the brain spawning large flows of active and entangled in-causal holoparticles within the im-im framework would underpin ordinary consciousness—holoparticles linking quantum and consciousness. This is why "consciousness, albeit immaterial, needs a physical structure to 'catalyze' it into being" (Ransford, 2023).

Theoretical engineer Edward Kamen proposes that "the human soul is a type of quantum field," which interacts with only certain fields in the physical universe, and not directly with matter. The claim is made that "fields that interact with the soul field include electromagnetic waves," citing *as* evidence "near-death experiences where events that could not have been seen through the eyes of the individual are verified." Extending the theory, Kamen speculates that because "electric fields and electromagnetic fields have the same quanta consisting of photons, electric fields may also interact with the soul field." This could result in the transfer of information, he says, from working memory to the soul through electric fields produced by neural ensembles in the human brain. Further, the soul field may also affect neurons on the molecular level, perhaps via electric fields and cytoelectric coupling (Kamen and Kamen, 2023).

Quantum consciousness: a growth market.

11.16. Rovelli's relational physics

Physicist Carlo Rovelli focuses on "the profoundly relational aspect of physics, manifest in general relativity, but especially in quantum mechanics." 20th century physics, he says, "is not about how individual entities are by themselves. It is about how entities manifest themselves to one another. It is about relations." This vindicates, he offers, "a very mild form of panpsychism," but "this same fact may undermine some of the motivations for more marked forms of panpsychism" (Rovelli, 2021).

"Although there is nothing specifically psychic or mental in the relational properties of a system with respect to another system," Rovelli says "there is definitely something in common with panpsychism, because the world is not described from the outside: it is always described relative to a physical system. So, physical reality is, in our current physics, perspectival reality" (Dorato, 2016).

Rovelli takes a deflationary view of the hard problem: "If our basic understanding of the physical world is in terms of more or less complex

systems that interact with one another and affect one another, the discrepancy between the mental and the physical seems much less dramatic." He concludes, "It is a world where physical systems—simple and complex—manifest themselves to other systems—single and complex—in a way that our physics describes. I see no reason to believe that this should not be sufficient to account for stones, thunderstorms, and thoughts" (Dorato, 2016).

According to George Musser, one way to argue that relationalism could solve the hard problem is, first, to recognize that "third-person physics isn't up to the task of explaining first-person experience and, specifically, its qualitative aspect (qualia)." Then, Rovelli's approach is to say that "physics is not, in fact, third-person; it is specific to each of us, just as each of us has our own private stream of consciousness." Thus, "the two sides are not so mismatched after all." However, Musser adds, "although physics may well be relational, subjective experience doesn't seem to be" (Musser, 2023a,b).

12. Integrated information theory

Integrated Information Theory (IIT), developed by neuroscientist Giulio Tononi and supported by neuroscientist Christof Koch, is an original, indeed radical model that states what experience is and what types of physical systems can have it (Tononi and Koch, 2015). IIT is grounded in experience, the phenomenology of consciousness, and it features mathematical description, quantitative measurement, scientific testability, broad applications, and nonpareil, intrinsic, cause-effect "structures." In other words, "IIT addresses the problem of consciousness starting from phenomenology—the existence of my own experience, which is immediate and indubitable—rather than from the behavioral, functional, or neural correlates of experience" (Tononi et al., 2022). Controversial to be sure, IIT has become a leading theory of consciousness.[41]

IIT accounts for consciousness in the following way. First, introspection and reason identify the essential properties of consciousness—the axioms of phenomenal existence. Then, each axiom is accounted for terms of cause–effect power; that is, "translating" a "phenomenal property into an essential property of the physical substrate of consciousness" [PSC]—yielding the postulates of physical existence. In this way, IIT claims to "obtain a set of criteria that a physical substrate of consciousness (say, a set of cortical neurons) must satisfy" (Tononi et al., 2022).

IIT asserts that distinct conscious experiences *are* in a literal sense distinct kinds of conceptual structures in a radical and heretofore unknown kind of "qualia space." IIT says (and introduced the idea) that for every conscious experience, there is a corresponding mathematical object such that the mathematical features of that object are isomorphic to the properties of the experience.

"Integrated information theory means that you need a very special kind of mechanism organized in a special kind of way to experience consciousness," Tononi says. "A conscious experience is a maximally reduced conceptual structure in a space called 'qualia space.' Think of it as a shape. But not an ordinary shape—a shape seen from the inside." Tononi stresses that simulation is "not the real thing." To be truly conscious, he said, an entity must be "of a certain kind that can constrain its past and future—and certainly a simulation is not of that kind" (Tononi, 2014b).

Christof Koch envisions how IIT could explain experience—how consciousness arises out of matter. "The theory makes two fundamental axiomatic assumptions," Koch explains. "First, conscious experiences are unique and there are a vast number of different conscious experiences. Just think of all the frames of all the movies you've ever seen or movies that will ever be made until the end of time. Each one is a unique visual experience and you can couple that with all the unique auditory experiences, pain experiences, etc. All possible conscious experiences are a gigantic number. Second, at the same time, each experience is integrated—what philosophers refer to as unitary. Whatever I am conscious of, I am conscious of as a whole. I apprehend as a whole. So, the idea is to take these two axioms seriously and to cast them into an information theory framework. Why information theory? Because information theory deals with different states and their interrelationships. We don't think the stuff the brain is made out of is really what's critical about consciousness. It's the interrelationship that's critical" (Koch, 2012b).

IIT starts from phenomenology itself—a point that Tononi stresses cannot be overstressed—with axioms that are deemed to be unequivocally and universally true for all instances of consciousness, such that whatever systems manifest these axioms will ipso facto manifest consciousness.

It is at this point that IIT seeks a mathematical expression of the fundamental properties of experience. It is not the reverse: IIT does not start from mathematics hoping to explain phenomenology; rather it starts with phenomenology and ends with mathematics (Tononi, 2014a). Because IIT's consciousness is a purely information-theoretic property of systems, not limited to brains or even to biology, Tononi constructs a mathematical function φ (phi) to measure a system's informational integration, with levels of φ covarying with degrees of consciousness (Van Gulick, 2019).

In IIT, each experience, each conscious percept, has clear characteristics: it is specific: it is what it is by how it differs from alternative experiences; it is unified: irreducible to noninterdependent components; it is unique: it has its own one-off borders and a particular spatiotemporal grain (Oizumi et al., 2014; Haun and Tononi, 2019).

These pillar concepts, all grounded in experience, are expressed by five phenomenological axioms: intrinsic existence, composition, information, integration and exclusion. These axioms are then formalized into postulates that prescribe how physical mechanisms, such as neurons or logic gates, must be configured to generate experience (phenomenology). The postulates are used to define integrated information as information specified by a whole that cannot be reduced to that specified by its parts (Tononi and Koch, 2015).

Each of IIT's five postulates defines and constrains the properties required of physical mechanisms to support consciousness (Tononi and Koch, 2015).

(i) Intrinsic Existence. Consciousness exists of its own inherent nature: each experience is real, and it exists from its own inherent perspective; to account for experience, a system of mechanisms in a state must exist intrinsically and it must have cause–effect power.

(ii) Composition. Consciousness is structured: each experience is composed of phenomenological distinctions; the system must be structured: subsets of system elements (composed in various combinations) must have cause–effect power upon the system.

(iii) Information. Consciousness is specific: each experience is the particular way it is; the system must specify a cause–effect-enabling structure that is the particular way it is; the system has a set of specific cause–effect repertoires that distinguishes it from all other possible structures (differentiation).

(iv) Integration. Consciousness is unified: each experience is irreducible to noninterdependent subsets of phenomenal distinctions; the cause–effect structure specified by the system must be unified: it must be intrinsically irreducible.

(v) Exclusion. Consciousness is definite, in content and spatiotemporal grain: each experience has the set of phenomenal distinctions it has, not less or more, and flows at the speed it does, not faster or slower; the cause–effect structure specified by the

[41] I do not give Integrated Information Theory its own category because I think IIT is *the* leading theory of consciousness. I do so because IIT is (i) *a* leading theory; (ii) original in premises and approach; (iii) controversial; and (iv) it would be misleading if classified in any of the other categories.

system must be definite and is maximally irreducible intrinsically ("conceptual structure").

It is this conceptual structure that is especially intriguing. Maximally irreducible intrinsically, it is also known as a "quale" (plural: qualia). Its arguably infinite varieties are formed when higher-order mechanisms specify concepts, with the constellation of all concepts specifying the overall form or shape of the quale. On this basis, Tononi and Koch formulate the central identity of IIT quite simply: *an experience is identical to a conceptual structure that is maximally irreducible intrinsically* (Tononi and Koch, 2015).

Questions that IIT seeks to address: Why the cerebral cortex gives rise to consciousness but the cerebellum does not, though the latter has even more neurons and appears to be just as complex? Is consciousness present in coma patients, preterm infants, non-mammalian species? Can computers, artificial intelligence (e.g., large language models) become conscious as humans are conscious?

Most relevant to our Landscape is IIT's fundamental ontology. Put simply, it begins with "the ontological primacy of phenomenal existence." The proper understanding of consciousness, IIT states, is "true existence, captured by its intrinsic powers ontology: what truly exists, in physical terms, are intrinsic entities, and only what truly exists can cause" (Tononi et al., 2022).

Seeking to embed its theory of consciousness within a coherent metaphysical framework, IIT introduces its "0th postulate" or "principle of being." To exist physically, IIT states, "means to have cause–effect power—being able to take and make a difference. In other words, physical existence is defined purely operationally, from the extrinsic perspective of a conscious observer, with no residual 'intrinsic' properties (such as mass or charge). Furthermore, physical existence should be conceived of as cause–effect power all the way down—namely down to the finest, 'atomic' units that can take and make a difference" (Tononi et al., 2022).

IIT deep conclusion is that "only a substrate that unfolds into a maximum of intrinsic, structured, specific, irreducible cause–effect power—an intrinsic entity—can account for the essential properties of phenomenal existence in physical terms." IIT goes on to claim that "only an intrinsic entity can be said to exist intrinsically—to exist for itself, in an absolute sense. By contrast, if something has cause–effect power but does not qualify as an intrinsic entity, it can only be said to exist extrinsically—to exist for something else—say, for an external observer—in a relative sense. And intrinsic, absolute existence is the only existence worth having—what we might call true existence. Said otherwise, an intrinsic entity is the only entity worth being."

In a crucial move, according to Tononi and colleagues, "IIT asserts an *explanatory identity*: an experience is identical to a Φ-structure. In other words, the phenomenal properties of an experience—its quality or how it feels—correspond one-to-one to the physical properties of the cause–effect structure unfolded from the physical substrate of consciousness. Thus, all the contents of an experience here and now—including spatial extendedness; temporal flow; objects; colors and sounds; thoughts, intentions, decisions, and beliefs; doubts and convictions; hopes and fears; memories and expectations—correspond to sub-structures in a cause–effect structure (Φ-folds in a Φ-structure)" (Tononi et al., 2022).

This means that "all contents of experience correspond to sub-structures within a maximally irreducible cause–effect structure—to Φ-folds within a Φ-structure. This applies not only to the experience of space, time, and objects, but also to conscious thoughts and feelings of any kind … Conscious alternatives, too, are Φ-folds within the Φ-structure corresponding to an experience.

Fundamentally, then, it is IIT's claim that when one is conscious, "what actually exists is a large Φ-structure corresponding to my experience, and it exists at its particular grain. No subsets, supersets, or parasets of that Φ-structure also exist, just as no other grains also exist. Moreover, what actually exists is only the Φ-structure corresponding to my experience, not also an associated physical substrate. Crucially, any content of my experience, including alternatives, reasons, and decisions, corresponds to a sub-structure [i.e., Φ-folds] within my Φ-structure, not to a functional property emerging from my [neural] substrate (Tononi et al., 2022).

Because "IIT starts from phenomenal existence and defines physical existence operationally in terms of cause–effect power 'all the way down,' with no intrinsic residue, such as mass and charge … a physical substrate should not be thought of as an ontological or 'substantial' basis—an ontological substrate—constituted of elementary particles that would exist as such, endowed with intrinsic properties."

This means, according to IIT, "because I actually exist—as a large intrinsic entity—the neurons of my substrate as such but the Φ-structure expressing its causal powers … Moreover, because my alternatives, reasons, and decisions exist within my experience—as sub-structures within an intrinsic entity—the neuronal substrates of alternatives, reasons, and decisions cannot also exist." If this picture is correct, IIT claims controversially, "it leaves no room for emergence or dualism of any sort" (Tononi et al., 2022).

As a defining corollary to its radical theory of consciousness, IIT claims that true free will exists, based on "the proper understanding of experience as true existence and on the intrinsic powers view: what truly exists, in physical terms, are intrinsic entities, and only what truly exists can cause." In contrast, in materialistic theories, with ontological and causal micro-determination, much of the debate about free will has revolved not around existence but around determinism/indeterminism, so that true free will is incompatible (Tononi et al., 2022).

In the same set of "adversarial collaboration" experiments that tested Global Workspace Theory (9.2.3), IIT was also subjected to the putatively rigorous protocols (Templeton World Charity Foundation, n.d.). "The specific IIT prediction examined was that consciousness is a kind of "structure" in the brain formed by a particular type of neuronal connectivity that is active for as long as a given experience, say, seeing an image, is occurring. This structure is said to be in the posterior cortex (the occipital, parietal, and temporal cortices in the back part of the brain). Preliminary results indicate that while "areas in the posterior cortex do contain information in a sustained manner"—which could be taken as evidence that the "structure" postulated by the theory is being observed—the independent "theory-neutral" researchers didn't find sustained synchronization between different areas of the brain, as had been predicted. Preliminary brain-scanning data to calculate φ for simplified models of specific neural networks within the human brain, such as the visual cortex, seem to correlate with states of consciousness (Lenharo, 2023a,b, 2024). Scanning the brain as people "slip into anesthesia" is said to offer support for IIT by calculating phi "for simplified models of specific neural networks within the human brain that have known functions, such as the visual cortex" (Wilson, 2023)—though, by all accounts, the empirical neuroscience of IIT is still rudimentary.

More recently, Koch defines IIT's consciousness as "unfolded intrinsic causal power, the ability to effect change, a property associated with any system of interacting components, be they neurons or transistors. Consciousness is a structure, not a function, a process, or a computation." He calls out "the theory's insistence that consciousness must be incorporated into the basic description of what exists, at the rock-bottom level of reality"—a claim that "has also drawn considerable fire from opponents." He explains that IIT "quantifies the amount of consciousness of any system by its integrated information, characterizing the system's irreducibility. The more integrated information a system possesses, the more it is conscious. Systems with a lot of integration, such as the adult human brain, have the freedom to choose; they possess free will" (Koch, 2024, p. 16).

Personally, I see IIT operating in three dimensions. First, measurement: IIT is a test of consciousness, assessing what things are conscious, and in those things that are, quantifying the degree of consciousness (e.g., coma patients). Second, mechanism: IIT can predict brain structures and functions involved in consciousness. Third, ontology (the most

controversial): IIT speculates that the conceptual structures of qualia are "located" in some kind of "qualia space" (13.5).

The first two dimensions, IIT's measurement and mechanism, could sit comfortably in the Materialism Theories area of the Landscape. The third, IIT's ontology of qualia, is radically distinct, its classification unclear—which is part of the reason why I have given IIT its own category on the Landscape.[42]

IIT claims that integrated information is both necessary and sufficient for consciousness: necessary seems uncontroversial; sufficient is the rub to many. But what I especially like about IIT's "conceptual structures" in "qualia space" is that IIT makes a stake-in-the-ground commitment to what consciousness per se may *literally be*—an appreciated rarity on the Landscape of consciousness (which does not mean that I subscribe to it).

12.1. Critiques of integrated information theory

IIT has its critics, of course, as should every scientific theory. Some like to highlight IIT's "anti-common sense" predictions imputing consciousness to objects and things that just do not in any way seem to be conscious. The early exchange between theoretical quantum computer scientist Scott Aaronson and Giulio Tononi is illuminating (Aaronson, 2014a, 2014b, 2014c; Tononi, 2014a).

More sensational, though not necessarily more illuminating, is the open letter from 124 neuroscientists and philosophers, including leading names, that characterizes IIT as "pseudoscience," a damning descriptor that relegates IIT with the likes of astrology, alchemy, flat Earth and homeopathy. The impact is such that one can no longer discuss IIT without referencing the letter (Fleming et al., 2023).

The letter is titled "The Integrated Information Theory of Consciousness as Pseudoscience" and it expresses concerns that the media, including both *Nature* and *Science* magazines "celebrated" IIT as "a 'leading' and empirically tested theory of consciousness"—prior to peer-review. Moreover, the letter criticizes the large-scale adversarial collaboration project as testing only "some idiosyncratic predictions made by certain theorists, which are not really logically related to the core ideas of IIT." The letter concludes, "As researchers, we have a duty to protect the public from scientific misinformation"—thereby igniting a firestorm in consciousness studies (Fleming et al., 2023).

Nature called it an "uproar" (Lenharo, 2023a,b). Responding, Christof Koch said, "IIT is a theory, of course, and therefore may be empirically wrong," but it makes its assumptions very clear—for example, that consciousness has a physical basis and can be mathematically measured.

David Chalmers was quick to comment: "IIT has many problems, but 'pseudoscience' is like dropping a nuclear bomb over a regional dispute. It's disproportionate, unsupported by good reasoning, and does vast collateral damage to the field far beyond IIT. As in Vietnam: 'We had to destroy the field in order to save it'" (Chalmers, 2023).

Hakwan Lau, one of the lead co-authors of the open letter, writes in an extended response to the "uproar" that "it is already false to characterize IIT, a panpsychist theory, as being empirically tested at all in a meaningful way." He argues that the entire field, including his own theory, is not at the stage where predictions can logically apply, stating "the advertised goal of really testing and potentially falsifying theories is unrealistic, given where the field is at the moment." Lau concludes by doubling down: "The world has now seen the nature of the conflicts and problems in our field, which can no longer be unseen. As a matter of fact, a sizable group of researchers think that IIT is pseudoscience" (Lau, 2023).

To physicist-neuroscientist Alex Gomez-Marin, "IIT ticks too many nonmaterialist boxes. There is academic hate for nonphysicalist speech … Cancel culture has unfortunately landed in the sciences, and just now in neuroscience. Using the pseudo-word is a pseudo-argument akin to name-calling to get rid of people … We have the responsibility to tell the truth, to the best of our ability" (Gomez-Marin, 2023).

My own view straddles the barbed fence. On one side, I agree that IIT has more weight than warrant in the pop-sci and even scientific communities, and that the results of the adversarial collaboration experiments, even if they could achieve their preset objectives, would not, perhaps could not, justify the core IIT theory. Moreover, the one-on-one adversarial experiments in general, with their high publicity, give the inappropriate impression that the two protagonists are the finalists in a theory-of-consciousness "run off," as it were, when in fact there are many dozens of other theories, nonphysical as well as physical, still in the game.

On the other side, I do not sign on to the "pseudoscience" branding; just because IIT may not be subject to traditional kinds of scientific methodologies, such as falsification, does not ipso facto force it out of bounds. (The multiverse in cosmology faces similar kinds of criticism.[43]) It could be that discerning consciousness escapes traditional science methodologies, as would a majority of theory-categories on this Landscape (not that discerning truth is a democratic process).

12.2. Koch compares integrated information theory with panpsychism

Neuroscientist Christof Koch states that Integrated Information Theory (IIT) shares many intuitions with panpsychism (13), in particular that "consciousness is an intrinsic fundamental property of reality, is graded, and can be found in small amounts in simple physical systems." Unlike panpsychism, Koch continues, IIT "articulates which systems are conscious and which ones are not [partially] resolving panpsychism's combination problem and why consciousness can be adaptive." The systemic weakness of panpsychism, or any other-ism, he says, "is that they fail to offer a protracted conceptual, let alone empirical, research program that yields novel insights or proposes new experiments" (Koch, 2021).

While uncertainty in theoretical development and inconceivability of empirical experiments are indeed weaknesses, should they ipso facto disqualify the theory? Experimental verification of string theory seems impossible because the energy levels required are many orders of magnitude larger than instrumentation could ever be built, and while some argue that this incapacity to be falsified should indeed disqualify string theory as a scientific theory, many string theorists disagree, betting their careers on it.

Koch's comparing IIT with panpsychism provides insight into both. Although admitting "I've always had a secret crush on the singular beauty of panpsychism," Koch counts himself among those surprised by its resurgence. He claims that IIT addresses several major shortcomings of panpsychism—"it explains why consciousness is adaptive, it explains the different qualitative aspects of consciousness (why a 'kind of blue' feels different from a stinky Limburger cheese), and it head-on addresses the combination problem"—per IIT's exclusion postulate, only systems with a maximum of Φ have intrinsic existence and are conscious" (Koch, 2021).

The exclusion postulate, Koch explains, "dictates whether or not an aggregate of entities—ants in a colony, cells making up a tree, bees in a hive, starlings in a murmurating flock, an octopus with its eight semi-autonomous arms, and so on—exist as a unitary conscious entity or not."

Koch claims that IIT "offers a startling counter-example to Goff's

[42] In attempting to classify IIT's ontology of "conceptual structures in qualia spaces," one could make a case that IIT could be a form of Panpsychism, a kind of Dualism, or part of a much-enhanced Materialism. IIT leaders reject Dualism, distance themselves from Panpsychism (13.2), and probably would argue that, to subsume IIT, Materialism as currently practiced would need to be stretched to the snapping point.

[43] We do not carry the multiverse analogy too far, because the multiverse has more independent theoretical motivations and mechanisms.

claim that qualitative aspects of conscious experience cannot be captured by quantitative considerations"—"a detailed, mathematical account of how the phenomenology of two-dimensional space, say an empty canvas, can be fully accounted for in terms of intrinsic causal powers of the associated physical substrate, here a very simple, grid-like neural network" (Koch, 2021, quoting Huang,). Integrated Information Theory may well be wrong, Koch says, but it "provides proof-of-principle for how quantitative primary qualities (here intrinsic causal power of simple model neurons that can be numerically computed; it doesn't get more quantitative than that) correspond to secondary qualities—the experience of looking at a blank wall" (Koch, 2021). (For Goff's response, 13.8.)

13. Panpsychisms

Panpsychism is the theory that phenomenal consciousness exists because physical ultimates, fundamental physics, have phenomenal or proto-phenomenal properties. This means that the essence of mentality, awareness, experience is a primitive, non-reducible feature of each and every part or aspect of physical reality, similar to the fundamental fields and particles in physics. Everywhere there is energy-matter, perhaps everywhere there is even spacetime, panpsychism says there is also something of consciousness. Everything that exists has a kind of inherent "proto-consciousness" which, in certain aggregates and under certain conditions, can generate inner awareness and experience. Panpsychism has multiple forms, nuances, and variants, as one would expect.

Panpsychism is one of the oldest theories in philosophy of mind, going back to pre-modern animistic religions, the ancient Greeks, Leibniz's monads, and a host of 19th century thinkers (Goff et al., 2022). Of late, in reaction to the seemingly intractable hard problem of consciousness, panpsychism has been gathering adherents and gaining momentum, especially among some analytic philosophers.

Panpsychism has strong non-Western roots, not often explored. In particular, the ideas and arguments from Indian philosophical traditions—especially Vedānta, Yogācāra Buddhism, and Śaiva Non-dualism—can enrich contemporary debates about panpsychism (Maharaj, 2020).

Panpsychism is also finding new supporters. Take "Kabbalah Panpsychism," an interpretation of the Jewish mystical tradition that understands consciousness to be holographically and hierarchically organized, relativistic, and capable of downward causation (Schipper, 2021).

Yujin Nagasawa provides a careful critique of panpsychism, arguing that although it seems promising, it reaches "a cognitive dead end" in that "even if it's true, we can't prove it." He challenges so-called constitutive Russellian panpsychism (14.1), which many consider to be the most efficacious panpsychist approach to the hard problem of consciousness, by arguing that it "seems caught in a deadlock: we are cognitively unable to show how microphenomenal properties can aggregate to yield macrophenomenal properties (or how cosmophenomenal properties can be segmented to yield macrophenomenal properties)" (Nagasawa, 2021).

Panpsychism's revival, indeed its flourishing, has left some philosophers (as well as scientists) dumbfounded and dismayed. (I'd feel remiss if I did not make an exception and at least recognize panpsychism's critics.) When I asked John Searle about panpsychism's increasing scholarly acceptance, he said, "I don't think that's a serious view. If you've got panpsychism, you know you've made a mistake. And the reason is that consciousness comes in discrete units. There has to be a place where my consciousness ends and your consciousness begins. It can't just be spread over the universe like a thin veneer of jam. Panpsychism has the result that everything is conscious, and you can't make a coherent statement of that" (Searle, 2014a).

To physicist Sean Carroll, "our current knowledge of physics should make us skeptical of hypothetical modifications of the known rules, and that without such modifications it's hard to imagine how intrinsically mental aspects could play a useful explanatory role." Part of the reason is the "causal closure of the physical" such that "Without dramatically upending our understanding of quantum field theory, there is no room for any new influences that could bear on the problem of consciousness." Other than materialism/physicalism, Carroll characterizes all theories of consciousness, including panpsychism, thus: "To start with the least well-understood aspects of reality and draw sweeping conclusions about the best-understood aspects is arguably the tail wagging the dog" (Carroll, 2021).

Here I array the nature and kinds of panpsychism on offer. I then summarize the perspectives of several well-known panpsychists.

13.1. Micropsychism

Proponents position panpsychism as a solution to the vexing problems of both materialism and dualism: replacing materialism's apparent impotence to account for consciousness and avoiding dualism's sharply bifurcated reality (Goff et al., 2022). The challenge, according to Chalmers, is how microphysical properties, characterized by a completed physics, relate to phenomenal (or experiential) properties, the most familiar of which is simply the property of phenomenal consciousness (Chalmers, 2013).

If panpsychism is correct, Chalmers says, there is microexperience and there are microphenomenal properties, which are obviously very different from human experience. Though a proper panpsychist theory of consciousness is currently lacking, some progress can be made.

Chalmers posits "constitutive panpsychism" as the thesis that macroexperience is (wholly or partially) grounded in microexperience. It is the thesis that microexperiences somehow add up to yield macroexperience. "Nonconstitutive panpsychism" holds that microexperience does not ground the macroexperience; rather, macroexperience is strongly emergent from microexperience and/or from microphysics (Chalmers, 2013).

In either case, traditional panpsychism is micropsychism, the position that all facts of panpsychism are formed at the micro-level. Two forms are distinguished, based on which aspect of mentality is privileged to be fundamental and ubiquitous: thought (*pancognitivism*) and consciousness (*panexperientialism*).

Panpsychism's thorniest problem, long recognized, is the "combination problem": How could micro-level entities with their own very basic forms of conscious experience somehow come together in brains to constitute human and animal conscious experience? The problem is severe: How could minuscule conscious subjects of rudimentary experience somehow coalesce to form macroscopic conscious subjects with complex experiences? (Goff et al., 2022).

13.2. Panprotopsychism

Panprotopsychism is distinguished from panpsychism in that the most basic protophenomenal properties are not themselves forms of consciousness, but rather must combine to generate forms of consciousness. Panprotopsychism would then be a kind of "emergent panpsychism," with the "phenomenal magic" requiring actions at two levels. Such emergence could be weak or strong, depending on whether one could in principle explain with perfection, solely from all the relevant facts about protophenomenal properties, all the relevant facts about phenomenal properties as manifest in conscious creatures (Goff et al., 2022).

"Panqualityism" is the view that protophenomenal properties are thin unexperienced qualities, whereas our conscious experience is thick with experienced qualities. Their challenge is to explain how such unexperienced qualities come to be experienced (Goff et al., 2022).

13.3. Cosmopsychism

Cosmopsychism reverses the standard explanatory ontology that

facts about big things are grounded in facts about small things. It posits that facts about little things are grounded in facts about big things. In other words, all things ultimately exist and are the way they are because of certain facts about the universe as a whole. Following the argument to its logical conclusion, there would be one and only one fundamental thing: the universe (Goff et al., 2022).

The minimal commitment of cosmopsychism is that the universe is in some sense "conscious." But just as micropsychism can have quantum particles with experience but no thought, so cosmopsychism can have the universe with some kind of experience, but without thought or agency.

Philip Goff makes a grander case. He develops a form of cosmopsychism, according to which the universe is a value-responding agent, an ultimate explanation motivated to account for the fine-tuning of the laws of physics and for the emergence of life and mind. He states that assuming fine-tuning needs explanation (it is not "an implausible fluke"), then there are three prime categories to evaluate: theism, multiverse, and "agent cosmopsychism." He argues that "agentive cosmopsychism is more theoretically virtuous than theism" because "God" would require "a commitment to both physical and non-physical kinds, and to both necessary and contingent kinds." Similarly, on the multiverse, he argues that "its structural complexity is realized by an astronomical number of distinct individuals" that "we cannot directly observe," whereas on agentive cosmopsychism, "the structural complexity is realized by the properties of a single individual," so there is no need to "postulate a single new individual." Goff reasons that agentive cosmopsychism is more parsimonious in that it requires "only one causal capacity rather than multiple" (Goff, 2019a,b). In his book, *Why? The Purpose of the Universe*, Goff calls this third way "teleological cosmopsychism"—some kind of conscious cosmos with some kind of goal-directed intent (Goff, 2023).

Thus, Goff rejects both theism and multiverse as explanations of fine-tuning, claiming that each has prediction errors and insurmountable problems. He focuses on the one universe that we have and know to be real, "merely" adding some new properties. "The universe is a conscious mind," he concludes, "with purposes of its own" that are "still unfolding" (Goff, 2023).

Yujin Nagasawa makes a novel case for cosmopsychism by drawing parallels between the relationship between mind and body in philosophy of mind and the relationship between God and cosmos in philosophy of religion. In analyzing articulations between panpsychism and cosmopsychism in philosophy of mind, and between polytheism and pantheism in philosophy of religion, he argues that by replacing divinity with phenomenality in pantheism we can derive cosmopsychism, and that doing so undercuts the combination problem (panpsychism's greatest challenge). He claims that using a top-down approach (with which he derives polytheism from pantheism) in conjunction with endorsing cosmopsychism, "the consciousness of the cosmos is ontologically prior to the consciousnesses of individuals like us." This, he says, avoids the combination problem (Nagasawa, 2019).

Sophisticated arguments for cosmopsychism come from Indian philosophy. Swami Vivekananda, the 19th century Indian monk who introduced Hinduism and Vedānta to the West, champions (with his followers) a distinctive form of cosmopsychism, a panentheistic cosmopsychism, according to which the sole reality is Divine Consciousness, which manifests as everything and everyone in the universe (Medhananda, 2022).

13.4. Qualia force

In the theory of Qualia Force, consciousness is a deep feature of physical reality that emerges from the fields and particles of fundamental physics, perhaps in the strong emergence sense that it cannot be explained by fundamental physics, even with knowledge beyond the current, even in principle. This qualia force differs from traditional panpsychism, where consciousness is co-fundamental with the deepest laws of physics. Although in some sense derivative from the fundamental laws of physics, this qualia force sustains its own faculties and capacities.

13.5. Qualia space

In the theory of Qualia Space, consciousness is an independent, non-reducible feature of reality that exists in addition to the deepest laws of fundamental physics (i.e., the four forces, spacetime, mass-energy). This heretofore unknown qualia-space aspect of the world may take the form of a radically new structure or organization of reality, perhaps a different dimension of reality.

The clearest current example would be Integrated Information Theory's (IIT) "conceptual structures" in qualia space (12). While this radically novel feature might suggest that IIT should be classified as a Panpsychism variant, I prefer to keep IIT independent but recognize the implicit connection by including "qualia space" here under Panpsychism. Note that IIT makes no claim that IIT's qualia space is ubiquitous in reality, as it would need be for IIT to be classic panpsychist in nature (Tononi and Koch, 2015). I can imagine other, distinct, non-IIT theories of consciousness founded on qualia-space.

In addition, the Qualia Research Institute's (QRI) "State-Space Consciousness Via Qualia Formalism and Valence Realism" holds that phenomenal properties are a fundamental feature of the world and aren't spontaneously created only when a certain computation is being performed" (Qualia Research Institute, n.d.). Although it "mostly fits well with a panpsychist view," QRI members prefer to classify themselves as a dual-aspect or neutral monism (6).

13.6. Chalmers's panpsychism

Panpsychism's renaissance can be attributed, at least in part, to philosopher David Chalmers, who has long entertained panpsychism as a possibly viable theory of consciousness (Chalmers, 1996; 2007; 2014a; 2014b; 2016c). "To find a place for consciousness within the natural order," he wrote, "we must either revise our conception of consciousness, or revise our conception of nature" (Chalmers, 2003). This sentence prepares the way, as it were, because if one is unwilling to deflate consciousness (as a kind of illusion), then one has no choice but to expand nature.

In his early work, Chalmers raised panpsychism, tentatively, in the context of his kind of dualism. "I resisted mind-body dualism for a long time, but I have now come to the point where I accept it, not just as the only tenable view but as a satisfying view in its own right. It is always possible that I am confused, or that there is a new and radical possibility that I have overlooked; but I can comfortably say that I think dualism is very likely true. I have also raised the possibility of a kind of panpsychism. Like mind-body dualism, this is initially counterintuitive, but the counterintuitiveness disappears with time. I am unsure whether the view is true or false, but it is at least intellectually appealing, and on reflection it is not too crazy to be acceptable" (Chalmers, 1996; Doyle, n.d.a).

While Chalmers's initial considerations of panpsychism were perhaps motivated by a "when-all-else-fails" perspective, his more recent papers address complex philosophical issues inherent in panpsychism (Chalmers, 2013).

Chalmers divides the most important views on the metaphysics of consciousness "almost exhaustively into six classes," three involving broadly reductive views, "seeing consciousness as a physical process that involves no expansion of a physical ontology," and three involving broadly nonreductive views, "on which consciousness involves

something irreducible in nature, and requires expansion or reconception of a physical ontology." Chalmers's sixth class embeds panpsychism[44] (Chalmers, 2003).

Panpsychism, more formally, is the theory that "consciousness is constituted by the intrinsic properties of fundamental physical entities: that is, by the categorical bases of fundamental physical dispositions. On this view, phenomenal or protophenomenal properties are located at the fundamental level of physical reality, and in a certain sense, underlie physical reality itself" (Chalmers, 2003).

In one line of argument, channeling Hegel, Chalmers starts with the thesis of materialism and the antithesis of dualism, and reaches the synthesis of panpsychism. This synthesis encounters the antithesis of panprotopsychism (13.2), from which he reaches the new synthesis of Russellian monism (14.1). This synthesis encounters the new antithesis of the combination problem, and whether there can be a new synthesis, Chalmers avers, remains an open question. Still, he argues that there is "good reason to take both panpsychism and panprotopsychism very seriously," and he concludes boldly: "If we can find a reasonable solution to the combination problem for either, this view would immediately become the most promising solution to the mind-body problem" (Chalmers, 2016a).

Chalmers has explored all the major non-materialism theories, including Quantum Theories (Chalmers and McQueen, 2022) and Idealism (Chalmers, 2020d) as well as Panpsychism, not wholly committing to any one. Although he favors Panpsychism, he recognizes its problems (Chalmers, 1996; 2007; 2014a; 2014b; 2016c).

13.7. Strawson's panpsychism

Philosopher Galen Strawson calls panpsychism "the most parsimonious, plausible and indeed 'hard-nosed' position that any physicalist who is remotely realistic about the nature of reality can take up in the present state of our knowledge" (Strawson, 2008, 2011). Conversely, he calls the denial of "conscious experience, the subjective character of experience, the 'what-it-is-like' of experience," in his words, "the silliest claim ever made" (Strawson, 2018).

Strawson is a sophisticated (and unabashed) champion of panpsychism, yet I decided to classify his theory under Monism (14), the next category, not here under Panpsychism. The reason is the prominence of his argument to subsume panpsychism under his enlarged understanding of "materialism" or "physicalism"—amplified by his insistence that, in essence, committing to panpsychism makes one a "real materialist" or "real physicalist" (Strawson, 2009) (14.4.). Strawson's social constructivist view: "Panpsychism is not a new theory, but it is newly popular, and it is still widely held to be 'absurd'. It remains to be seen whether it will ever advance to 'obvious'"[45] (Strawson, 2019b).

13.8. Goff's panpsychism

Philosopher Philip Goff starts from the premise "one thing that science could never show is that consciousness does not exist" and he mounts a vigorous, rigorous case for panpsychism, the staggering idea (at least initially) that "consciousness is a fundamental and ubiquitous feature of the physical world." He positions consciousness as "fundamental to what we are as human beings," "the source of much that is of value in existence," "the ground of our identity and a source of great value," and "the only thing we know for certain is real." He sets up the explanatory tension: "Nothing is more certain than consciousness, and yet nothing is harder to incorporate into our scientific picture of the world" (Goff, 2019a,b).

Goff sets out to undermine materialism's traditional argument that neuroscience has both made enormous advances, evincing its power, and it has a long way to go, explaining its lack of success. None of the neuroscientific advances, Goff says, "has shed any light on how the brain produces consciousness" and while many neuroscientists take this as evidence that one day neuroscience will "crack the mystery of consciousness," Goff turns their argument around and claims it is evidence that the cause of consciousness differs in kind from the causes of other scientific problems. "Explaining consciousness will require a change in our understanding of what science is," he argues; this is because "the scientific revolution itself was premised on putting consciousness outside of the domain of scientific inquiry" (i.e., *Galileo's Error*). "If we ever want to solve the problem of consciousness," he declares, "we will need to find a way of putting it back" (Goff, 2019a,b).

Goff positions panpsychism as conceding that "there is an element of truth" in each of the claims of naturalistic dualism, that immaterial minds are part of the natural order, and materialism, that the physical world will ultimately explain inner experience. No doubt, as Goff states, "An increasing number of philosophers and even some neuroscientists are coming around to the idea that it [panpsychism] may be our best hope for solving the problem of consciousness" (Goff, 2019a,b). It's fascinating to explore why.

Targeting each of the major competing theories of consciousness, Goff claims to show their inadequacies—which, given the challenge of explaining consciousness, is not the most difficult of tasks. Goff defends panpsychism, stressing arguments from simplicity and parsimony. Panpsychism, obviously, has its own problems—especially the pesky combination problem—which Goff gamely addresses. His debates with intellectual opponents are probative (Kastrup, 2020a, 2020b).

Goff responds to Christof Koch's "startling counter-example to Goff's claim that qualitative aspects of conscious experience cannot be captured by quantitative considerations" (4.2). But while Goff voices "no doubt that we can in principle map out the quantitative structure of visual experience in mathematical language," he denies that such a mathematical description can fully capture the qualities that fill out that structure. If it could, he says, "we could use the mathematical description to explain to a colorblind neuroscientist what it's like to see color," which, he says, is absurd. Purely quantitative language entails an "explanatory limitation," Goff contends, and "if a purely quantitative theory can't even convey the qualities of experience, then it certainly can't reductively account for them" (Goff, 2021).

In a special issue of the *Journal of Consciousness Studies* dedicated to Goff's panpsychism, Goff responds extensively to commentators and critics (*Journal of Consciousness Studies*, 2021). He frames his argument broadly: "The problem of consciousness is rooted in the philosophical foundations of science" such that "we can't account for the qualities of consciousness in the purely quantitative language of physical science" (Goff, 2021).

In his multifaceted replies to scientists, Goff stresses science's explanatory limitation and he is not persuaded that the various arguments, such as Rovelli's relational or perspectival approach (11.16), can solve the "two aspects of consciousness that give rise to a hard problem: qualitivity and subjectivity"[46]—either, in Goff's view, would be "sufficient to refute materialism" (Goff, 2021).

In his multifaceted replies to philosophers, Goff focuses on panpsychism's combination problem and offers a form of "hybrid panpsychism," which distinguishes sharply "between subjects and their experiences, holding that the former are 'strongly emergent' (i.e., they can't be reductively explained) whilst the latter are 'weakly emergent'

[44] The sixth class is labeled "Monism," which means only one of a kind of fundamental stuff, a stuff with both phenomenal and physical properties (Chalmers, 2003).

[45] Strawson's quote follows his reference to William James: "'First, you know, a new theory is attacked as absurd,' William James once remarked; 'then it is admitted to be true, but obvious and insignificant; finally it is seen to be so important that its adversaries claim that they themselves discovered it.'"

[46] Goff in "Chalmers's Hard Problem of Consciousness," near the beginning of this paper.

(i.e., they can be reductively explained, in terms of consciousness at the level of physics)" (Goff, 2021).

Thus, Goff addresses the challenge that strong emergent panpsychism, which postulates fundamental psychophysical laws of nature, suffers problems similar to those of dualism, and weak emergent panpsychism, without such extra laws, suffers problems similar to those of physicalism. He argues that this "new hybrid of the strong and weak emergentist forms of panpscyhism"—where "subjects of experience are strongly emergent but their phenomenal properties are weakly emergent"—is a form of cosmopsychism rather than micropsychism (Goff, 2024).

In his multifaceted replies to theologians, Goff disputes the notion that "the case for panpsychism should also lead one to theism," because, for one, a "self-explainer" can be the universe itself; God is not the only choice here (Goff, 2021).

13.9. A. Harris's panpsychism as fundamental field

Neuroscience/consciousness writer Annaka Harris posits that "consciousness isn't self-centered" and that we should "think of consciousness like spacetime—a fundamental field that's everywhere." In *Conscious*, her "meditation on the self, free will, and felt experience," she wonders whether "we've been thinking about the problem backward. Rather than consciousness arising when non-conscious matter behaves a particular way, is it possible that consciousness is an intrinsic property of matter—that it was there all along?" (A. Harris, 2020, 2019).

Harris argues that contemporary panpsychism, the idea that "all matter is imbued with consciousness in some sense," differs significantly from its earlier versions, now "unencumbered by any religious beliefs … [and] informed by the sciences and fully aligned with physicalism and scientific reasoning." She carefully distinguishes between consciousness and thought, so that if some primitive consciousness does inhabit all matter, this does not mean that inanimate objects, like rocks, have experiences or "points of view." Only certain complex systems, like humans and other animals, have such (A. Harris, 2020).

Harris has a disarmingly simple solution for panpsychism's vexing combination problem. "We run into a combination problem," she says, "only when we drag the concept of a 'self' or a 'subject' into the equation. The solution to the combination problem is that there is really no 'combining' going on at all with respect to consciousness itself." It all depends on "the arrangement of the specific matter in question" (A. Harris, 2020).

As for "the correct resolution to the mystery of consciousness," Harris says she personally "is split between a brain-based explanation and a panpsychic one. So while I'm not convinced that panpsychism offers the correct answer, I am convinced that it is a valid category of possible solutions that cannot be easily dismissed." She prefers, however, a more neutral term, such as "intrinsic nature theory" or "intrinsic field theory" (A. Harris, 2020).

13.10. Sheldrake's self-organizing systems at all levels of complexity

Iconoclastic biologist Rupert Sheldrake's radical views on the nature of reality inform theories of consciousness in two ways. One, covered here, envisions self-organizing systems at all levels of complexity as a robust form of panpsychism. A second, covered later, is how "morphic fields" relate to consciousness (17.9) (Sheldrake, n.d.a).

Sheldrake sees no "sharp separation of consciousness in physical reality; " rather, "our consciousness and our physical reality go hand in hand." He says, "I am certainly not a dualist," but he does posit "a kind of mind or consciousness at all levels of nature"—in atoms and molecules, cells and organisms, plants and animals—and, astonishingly, "in the earth, in the sun, in the galaxy, and in the whole universe" (Sheldrake, 2007a). Motivated in part by "the recent panpsychist turn in philosophy, " Sheldrake suggests that "self-organizing systems at all levels of complexity, including stars and galaxies, might have experience, awareness, or consciousness" (Sheldrake, 2021).

Sheldrake defines consciousness, idiosyncratically, as "largely about making choices, considering alternative possibilities." He states, "Consciousness is about choice. It's about choosing among possibilities." What then does consciousness do?" he asks. "It enables different possibilities to be held together and chosen among"—yielding his nonmainstream postulate that "any system in nature that has possibilities that are not fixed would have some measure of consciousness." A key to Sheldrake's consciousness is how "physical reality at any moment opens up into the future through a range of possibilities … And it's those future possibilities which are the realm in which consciousness operates." All things that have consciousness are in this same state (Sheldrake, 2007b).

Referencing the indeterminate nature of quantum mechanics, Sheldrake says, "even a hydrogen atom and an electron has a whole realm of possibility open to it, of which only a small fraction is realized … [but] to what extent it's making real choices, to what extent consciousness [occurs] in something as simple as an electron, is arguable and probably undecidable."

He then makes his even more startling move: "I think it gets much more interesting when we look at larger systems like the sun or the galaxy." Here's Sheldrake's argument: "If consciousness emerges from patterns of electrical activity in our brains, as materialists would assume, the sun has vastly more complex patterns of electrical activity than our brains. So why shouldn't that be associated with consciousness? Why shouldn't the sun have a mind? And if the sun has a mind, why not all the stars? If all the stars have minds, what about huge collections of stars in galaxies, linked up by vast plasma currents of electricity surging across trillions of miles of galactic space, with rhythmic patterns connecting all parts" (Sheldrake, 2007b).

Sheldrake goes ultimate: "Maybe the entire universe has a mind. Why not? There may be many, many levels of consciousness." Sheldrake's consciousness is a nesting of consciousnesses at all levels of organization resident in reality. (Actually, Sheldrake would prefer the term "mind" or "mind-like aspects" than "consciousness," because from our perspective these nonbiological "minds" might be considered "unconsciousness" or "nonconscious.")

Sheldrake clarifies that these kinds of nonbiological consciousnesses would be totally different from human consciousness. Just as human consciousness differs from dog consciousness, he says, "sun consciousness' differs from "earth consciousness," and so on. If the sun is conscious, "it may be concerned with the regulation of its own body and the entire solar system through its electromagnetic activity, including solar flares and coronal mass ejections. It may also communicate with other star systems within the galaxy" (Sheldrake, 2021).

"It's hard for us to imagine other forms of consciousness," Sheldrake stresses. Nonetheless, he suggests, "there's mind-like organization at all levels of the universe and in nature," including a mind-like organization of the entire universe."

Sheldrake suggests that "the electrical fields of organized or self-organizing systems are a good candidate for an interface between consciousness and the physical structure"—whether cells, animals, humans or stars. Note that in Sheldrake's system the electrical fields are not the consciousness per se, which he describes as "matters of possibilities." Rather, the electrical fields mediate between physical and consciousness (as defined).

Sheldrake concludes that all levels or kinds of organization in nature have their own kind of mind, mediated by electrical fields, and that the entire universe as a whole also has some kind of consciousness or mind, which would play an important part in what happens as the universe evolves (Sheldrake, 2021, n.d.a).

13.11. Wallace's panpsychism inside physics

To philosopher of physics David Wallace, one way to motivate panpsychism is as a kind of synthesis of materialism (consciousness is just reducible to the physical) and dualism (consciousness is separate

from the physical). Each, he says, has major advantages and major disadvantages. "Materialism seems like it can't adequately explain consciousness. Dualism can't give an adequate causal role to consciousness." Wallace envisions panpsychism "as a way of getting the best features of both materialism and dualism without their disadvantages," which is why he envisions "panpsychism potentially as the synthesis of materialism and dualism" (Wallace, 2016a).

Wallace starts with dualism, where "consciousness is real and fundamental, existing at the bottom-most level of nature"—but dualism, he stresses, has a serious problem: "How can dualism play a causal role in physics, because physics looks to be closed and autonomous?" This is where Wallace has panpsychism playing the critical causal role by looking to the intrinsic nature of physics. "Physics tells us how fields and particles relate to each other, but it doesn't tell us about what they really are in themselves. According to panpsychism, consciousness is right there inside the physical world, as its intrinsic nature, and thus when one field or particle affects another, it's really consciousness which is doing the causing. So, you get a causal role for consciousness in physics and you get consciousness as real and fundamental." That's a set of advantages, Wallace argues, "that no other theory has—and it motivates panpsychism" (Wallace, 2016a).

Wallace explains that when physics gives a mathematical theory of how all fundamental physical entities relate to one another quantitatively, it doesn't tell us what these entities actually are. This gives room, he says, for panpsychism to offer a hypothesis about what these entities actually are. However, Wallace stresses that the intrinsic relationship among all these entities, non-conscious and conscious, must be as described by the laws of physics. There is no need to postulate a fifth kind of force or feature as the carrier of panpsychic consciousness, he says; rather, the need is, as Stephen Hawking put it, "What is it that breathes fire into the equations?" That would be the fundamental nature of the reality that physics is describing (Wallace, 2016a, 2016b). Regarding consciousness itself, Wallace would have it not so much as requiring an extra force or feature in the physical world (as panpsychists sometimes imply), but rather as the underlying nature of the processes that physics is describing mathematically.

13.12. Whitehead's process theory

Although Process Theory is already classified under Materialism Theories/Relational, motivated by Griffin's "panexperiential physicalism" (9.7.7), I am making the odd decision to classify it also here under Panpsychism, motivated by process philosopher Matthew Segall's bringing Alfred North Whitehead's Philosophy of Organism "into conversation with the recent panpsychist turn in analytic philosophy of mind." According to Segall, "Whitehead's unabashedly metaphysical project broadly aligns with recent critiques of reductive physicalism and the turn toward a conception of experience as basic to Nature." Whitehead's panexperientialism, he says, attempts to take consciousness at face value, resisting inflationary accounts toward absolute idealism and deflationary toward eliminative materialism (Segall, 2020).

Segall distinguishes Whitehead's process-relational panexperientialism from the dominant substance-property variants of panpsychism, arguing that Whitehead's version avoids many of panpsychism's conceptual difficulties. To begin, "Whitehead's process-relational rendering doesn't claim that experience is a 'primary attribute' or 'intrinsic property' of matter. This is because in Whitehead's view, physics has moved beyond the substantialist view of matter, and talk of essential or accidental properties only made sense given such an [archaic] ontology … While there was an 'essential distinction between [substantial] matter at an instant and the agitations of experience,' with this conception of matter having been swept away, a door is opened to analogies between energetic activity and concrete experience." Thus, "Experiences, like energy vectors, are intrinsically process-relational in that they always involve transition beyond themselves: They manifest in a 'specious present' [Whitehead] as a tension between the actualized facts of an inherited past and the potential forms of an anticipated future" (Segall, 2020).

While Segall has "the philosophical payoff of panpsychism" dissolving the hard problem of consciousness by "giving experience its proper place in Nature without undermining the scientific image of the universe." Regarding substance-property panpsychism's combination problem, Segall says that Whitehead's process-relational approach "doesn't so much solve this problem as it does reframe the problem's presuppositions." Whitehead does this not by "struggling to understand how abstract little bits of extended matter with mental intrinsic properties might combine to form bigger bits of minded matter," but rather by starting "with a more concrete conception of energetic activity that is more easily analogized to agitations of experience. Neither 'matter' nor 'mind' is composed of simply located bits or states." Thus, "the ongoing composition of the cosmos is achieved not through the summation of tiny parts, nor through subtraction from some larger whole (as cosmopsychists would have it), but by a dipolar relational process with both a stability providing material pole and a novelty inducing mental pole."

According to Segall, "Whitehead is neither a micropsychist nor a cosmopsychist exclusively. He tries to have it both ways. There is a universal soul, a psyche of the cosmos, a primordial actuality or God of this world, and there are countless creatures creating in concert with it. Creativity transcends both God and finite actualities; it is the source of all co-evolving parts, wholes, bodies, and souls. Whitehead's account of process includes moments of combination and decombination, conjunction and disjunction. For Whitehead the combination problem becomes a logic of concrescence [i.e., 'the production of novel togetherness'], a feature and not a bug, a way of thinking change as more than just the rearrangement of pre-existing parts or the fragmentation of a pre-existing whole but as *genuine becoming*, as an 'emergent evolution' or 'creative advance' where neither wholes nor parts pre-exist their relations … and in each act of creation the past is not destroyed but reincarnated in the novel occasion … Concrescence is thus a cumulative process and not a merely additive one" (Segall, 2020).

Some call Whitehead's defense of a panpsychist philosophy the theory's most significant development in the 20th century. Whitehead radically reforms "our conception of the fundamental nature of the world, placing *events* (or items that are more event-like than thing-like) and the ongoing *processes* of their creation and extinction as the core feature of the world, rather than the traditional triad of matter, space and time. His panpsychism arises from the idea that the elementary events that make up the world (which he called *occasions*) partake of mentality in some—often extremely attenuated—sense, metaphorically expressed in terms of the mentalistic notions of creativity, spontaneity and perception" (Goff et al., 2022).

This makes Whitehead an emergentist rather than a constitutive panpsychist. "A given moment of conscious experience is not reducible to nor simply identical with its constituent parts." It is "a creative repetition of the past rather than a combination of parts" (Segall, 2020).

14. Monisms

Monism is the theory that all of reality consists of exactly one concrete object or thing, and everything that exists is, in some sense, that one concrete object or thing (or part of it) (Schaffer, 2018). Because monisms seek to account for both mental and physical aspects of reality, avoiding the metaphysical difficulties of dualism and overcoming the explanatory weakness of materialism, it follows that monisms are also theories of consciousness. In one way or another, monisms must cover or contain everything we call mental as well as everything we call physical. (The existence of various kinds of monisms does not much affect how monisms are theories of consciousness.)

There is substantial and obvious articulation, or overlap, between Monism and Panpsychism. Both are motivated by the need to integrate consciousness into the deep nature of reality; thus, monism theories have panpsychism features and panpsychism theories can be seen as

monisms (to first approximations). Perhaps it is simply the case of each reinforcing the other in what are merely different perspectives, historical and theoretically, on essentially the same stance regarding the fundamental nature of ultimate reality. However, they are not entirely the same in that panpsychism has phenomenal or protophenomenal properties as a part or aspect of some larger, fundamental entity, while monism has only one fundamental entity that encompasses everything (although it is not intuitively obvious that this distinction makes much of a difference). Separate categories for monism and panpsychism are certainly justified, yet the boundary can be fuzzy.

Some of the theories or ways of thinking that follow are categorized under Monism because all other categories seem less appropriate, imposing a belief system that should not apply. (I hope each of these theories feels less uncomfortable in Monisms.)

14.1. *Russellian Monism*

Russellian Monism, based on the insights of philosopher Bertrand Russell, is a view that phenomenal consciousness and the physical world are deeply intertwined (Alter and Nagasawa, 2012). It characterizes the fundamental essence of matter as beyond that which can be accessed by empirical science or described by mathematical models. The claim is that the conundrum of consciousness, and how it fits into the physical world, is so critical that integrating consciousness (or proto-consciousness) into fundamental reality could suggest that the elements integrated are distinct from the ones revealed as a result of integration, thus shadowing if not revealing hidden, deep, intrinsic features of the physical world (Goff et al., 2022).

Three core concepts conjoin to generate Russellian monism: (i) *structuralism about physics* (describing the world in terms of its spatio-temporal/relational structure and dynamics); (ii) *realism about quiddities* (or *inscrutables*) (there are *quiddities/inscrutables*, which underlie but are not limited by the structure and dynamics physics describes); and (iii) *quidditism* (or "*inscrutinism") about consciousness* (at least some *quiddities/inscrutables* are either phenomenal or protophenomenal properties and are thereby relevant to the essence of consciousness) (Alter and Nagasawa, 2012; Alter and Pereboom, 2019).

Daniel Stoljar presents four different accounts of the inscrutables: "(i) Phenomenal monism: The inscrutables are phenomenal in nature. (ii) Protophenomenal monism: The inscrutables are not themselves phenomenal in nature but they are a precursor to phenomenal properties. (iii) Physical monism: The inscrutables are physical in nature, though they are outside the domain of physics. (iv) Neutral monism: The inscrutables are neither phenomenal nor physical but rather have a nature that is neutral between the two" (Kind and Stoljar, 2023).

To Russellian monists, if the intrinsic nature of fundamental matter is itself infused by phenomenal properties that express consciousness, then the model is "Russellian panprotopsychism." Either way, the claim is that Russellian Monism bests dualism by avoiding problematic physical-nonphysical causation and bests materialism by taking consciousness seriously and grounding it in ultimate reality (Goff et al., 2022).

Philip Goff explains that "Russellian monism comes in both smallest and priority monist forms. For the smallest, fundamental categorical properties are instantiated by micro-level physical entities, perhaps electrons and quarks. For the priority monist, the most fundamental categorical properties are instantiated by the universe as a whole." Each of the categories can be matrixed by whether its properties are "consciousness evolving" or "not consciousness evolving," yielding four categories of Russellian monism (Goff, 2019a,b).

14.2. *Davidson's anomalous monism*

Anomalous Monism, developed by philosopher Donald Davidson, holds that mental properties and events must have a physical ontology, but that psychology cannot be reduced to physics. As such, Anomalous Monism is a form of property dualism (15.1) and shares features with Non-reductive Physicalism (10). As Davidson writes, "anomalous monism holds that mental entities (particular time- and space-bound objects and events) are physical entities, but that mental concepts are not reducible by definition or natural law to physical concepts" (Davidson, 1993).

Anomalous Monism is distinguished from other theories of consciousness by the intersection of three propositional claims: (i) Mental events have genuine causal powers and cause physical events. (ii) All causal relationships are backed by natural laws. (iii) There are no natural laws connecting mental phenomena with physical phenomena. While each claim has adherents, it is the conjunction of the three claims, taken together, that gives Anomalous Monism its distinctive look, because at first glance there surely appears to be inconsistency (if not contradiction) (Silcox, n.d.).

To appreciate Anomalous Monism's originality and subtleties, it needs to be unpacked. A foundational principle is that "psychology cannot be a science like basic physics, in that it cannot in principle yield exceptionless laws for predicting or explaining human thoughts and actions (mental anomalism)." And it is "precisely because there can be no such strict laws governing mental events that those events must be identical to physical events" (Yalowitz, 2021).

How to make sense of this? What may seem like a non sequitur is in fact the heart of the argument. If the physical is the only existent, then ipso facto the mental (like everything else) must come from the physical with robust regularities. But how do the mental and physical articulate? What is this connection?

Here's the flow of the argument. Given that the mental has causal powers (claim 1), and that all causal relationships require natural law (claim 2), because there are no natural (psychophysical) laws that connect the mental and the physical (claim 3), therefore there is only one logical way to connect mental events and physical events—now denied a causal relationship (combining claims 2 and 3): they must be literally *the same thing*, the mental and the physical must be in the strong sense *identical*.

As identity theories of consciousness are a leitmotif, and a touchstone, for comprehending the Landscape, we go deeper. Earlier identity theories held that "claims concerning the identity of particular mental and physical events (tokens) depended upon the discovery of lawlike relations between mental and physical properties (types) … Token-identity claims thus depended upon type-identity."

But Anomalous Monism, almost by its founding premise, does not depend on such psychophysical laws. "Davidson's position is dramatically different … It in effect justifies the token-identity of mental and physical events through arguing for the impossibility of type-identities between mental and physical properties" (Yalowitz, 2021).

Now of course this argument proves that the mental and the physical are identical only to the extent that the three premises are all accepted as valid, because the conclusion is embedded (or "hidden") within the premises (as are all deductive arguments structured in this way). Anomalous Monism differs from other theories especially in claiming that there are no natural laws connecting mental phenomena with physical phenomena. Other theories assume there are laws or ways to connect the mental and the physical, or laws or ways where the mental and the physical are part of, or derived from, the same stuff.

14.3. *Velmans's reflexive monism*

Psychologist Max Velmans describes Reflexive monism as "a dual-aspect theory" (in the tradition of Spinoza) which argues that the one basic stuff of which the universe is composed has the potential to manifest both in physical forms and as conscious experience. According to the theory, in the universe's "evolution from some primal undifferentiated state," it differentiates into "distinguishable physical entities, at least some of which have the potential for conscious experience, such as human beings" (Velmans, 2008).

Velmans's "Monism" is straightforward: "the view that the universe,

at the deepest level of analysis, is one thing, or composed of one fundamental kind of stuff." His "Reflexive" is more complex: "Each human participates in a process whereby the universe differentiates into parts and becomes conscious in manifold ways of itself, making the entire process reflexive."

Velmans focuses on "the ontological status and seeming 'out-thereness' of the phenomenal world and to how the 'phenomenal world' relates to the 'physical world', the 'world itself', and processing in the brain." He seeks both to bridge the materialist-dualist gap and to differentiate Reflexive Monism from "both dualism and variants of physicalist and functionalist reductionism, focusing on those aspects of the theory that challenge deeply rooted presuppositions in current Western thought." Within Reflexive Monism, he says, "the brain is simply what the human mind looks like when it is viewed from an external (third-person) perspective, and neither the observations of external observers nor those of subjects have a privileged status" (Velmans, 2008).

Central to Velmans's argument is that in terms of their phenomenology, "experiences of the external world are none other than the physical world-as-experienced, thereby placing aspects of human consciousness in the external phenomenal world, rather than exclusively within the head or brain" (Velmans, 2023). His reflexive model also makes the strong claim—the radical claim—that, "Insofar as experiences are anywhere, *they are roughly where they seem to be*." For example, "A pain in the foot is in the experienced foot, and this perceived print on this visible page really is out here on this visible page. Nor is a pain in the foot accompanied by some other, *additional* experience of pain in the brain, or is this perceived print accompanied by some additional experience of print in the brain. In terms of phenomenology, this perceived print, and my experience of this print are *one and the same*." Technically, he says, this is a form of *phenomenological externalism* (Velmans, 2008).

To understand how experienced objects and events might really be (roughly) where they are experienced to be, Velmans looks closely at "the way that phenomenal space relates to 'real' space. No one doubts that physical bodies can have real extension and location in space." But we "find it hard to accept that experiences can have a real, as opposed to a 'seeming' location and extension." We do not doubt, he says, that a physical foot has a real location and extension in space, but a pain in the foot can't really be in the foot, as we are "committed to the view that it is either nowhere or in the brain." Although this common understanding that "location in phenomenal space is not location in real space," according to Reflexive Monism, "this ignores the fact that, in everyday life, we take the phenomenal world to be the physical world. It also ignores the pivotal role of phenomenal space in forming our very understanding of space, and with it, our understanding of location and extension in measured or 'real' space" (Velmans, 2008).

Velmans says that Reflexive Monism provides a different perspective on the hard problem of consciousness by viewing physical and experiential aspects of mind as arising from a common "psychophysical ground." Thus, he argues, of the competing views of consciousness on offer, Reflexive Monism, being a non-reductionist dual-aspect theory, "most closely follows the contours of ordinary experience, the findings of science, and common sense" (Velmans, 2008).

14.4. Strawson's realistic monism and real materialism

In defining an all-pervading materialism, encompassing all mental as well as all physical properties and objects, philosopher Galen Strawson espouses his kind of monism, "Realistic Monism," as he calls it (Strawson, 2009). "I'm attracted to the thing-monist view," he says, "according to which the universe is a single thing in some non-trivial sense" (Strawson, 2020a). His principal thesis is "the primacy of panpsychism" and he claims "compelling reasons for favoring panpsychism above all other positive substantive proposals about the fundamental nature of concrete reality" (Strawson, 2020b).

Strawson deconstructs the concept and use of the term "materialism," showing that, historically, it had nothing to do with denial of the existence of consciousness, but rather that consciousness is wholly material. He laments that the words "materialism" and "physicalism" have come to be treated as synonymous and to involve denial of the existence of consciousness. It is, he says, ironic that these two words have "been used to name a position in the philosophy of mind that directly rejects the heart of materialism and is certainly false" (Strawson, 2011).

Strawson asserts that physicalism (or materialism[47]), that is, "real physicalism" (or "real materialism"), entails panexperientialism or panpsychism, on one assumption: it entails panpsychism given the impossibility of "radical" emergence. Moreover, given that all physical stuff is energy, in one form or another, we may suppose that "all energy is an experience-involving phenomenon" (Section: Strawson, 2003, 2009, 2015; 2020a; Strawson and Russell, 2021; Strawson, 2011).

Strawson happily admits, "This sounded crazy to me for a long time, but I am quite used to it, now that I know that there is no alternative …" It may also sound odd to use "physical" to characterize mental phenomena like experiential phenomena, but real physicalism, realistic physicalism, entails panpsychism, and whatever problems are raised by this fact, he exhorts, are problems a real physicalist must face.

Strawson defines physicalism to be the view that "every real, concrete phenomenon in the universe is … physical." It is a view about the actual universe, and that he assumes it is true. But then comes the "Strawsonian Twist."

What does it take to be a "realistic physicalist" or a "real physicalist?" He makes one thing absolutely clear. "You're certainly not a realistic physicalist, you're not a real physicalist, if you deny the existence of the phenomenon whose existence is more certain than the existence of anything else: experience, 'consciousness', conscious experience, 'phenomenology', experiential 'what-it's-likeness', feeling, sensation, explicit conscious thought as we have it and know it at almost every waking moment."

All materialists hold that every concrete phenomenon in the universe is physical, and they are neither sensible nor realistic, Strawson says, if they have any inclination to deny the concrete reality of mental phenomena like experiential phenomena. He concludes by taking no prisoners: "Full recognition of the reality of experience, then, is the obligatory starting point for any remotely realistic version of physicalism … It is the obligatory starting point for any theory that can legitimately claim to be 'naturalistic' because experience is itself the fundamental given natural fact" (Strawson, 2008).

As a "real physicalist," in his definition, Strawson holds that the mental/experiential is physical, and he is happy to say, along with many other physicalists, that experience is 'really just neurons firing', at least in the case of biological organisms like ourselves. But when he says these words he means something radically different from what almost all physicalists mean. He does not mean that all characteristics of what is going on, in the case of experience, can be described by physics and neurophysiology (or any non-revolutionary extensions of them). His claim is stunningly different. It's that experiential phenomena "just are" physical, so that there is a lot more to neurons than physics and neurophysiology account for (or *can* account for). No one who disagrees with this, he says, is a "real physicalist." This is Strawson's challenge.

Reviewing Strawson's book subtitled, "Does Physicalism Entail Panpsychism?", philosopher Jerry Fodor shares Strawson's intuition that the hard problem is "not going to get solved for free" and "views that we cherish will be damaged in the process." Fodor concludes, "If you want an idea of just how hard the hard problem is, and just how

[47] Strawson uses "physicalism" and "materialism" interchangeably as ontological descriptors, though at one point preferring "physicalism" because "matter" is now specially associated with mass-energy while "physical" is more encompassing. For the uses of "materialism" and "physicalism" in this paper, see Footnote 12.

strange things can look when you face its hardness without flinching, this [Strawson's book] is the right book to read" (Fodor, 2007).

14.5. Polkinghorne's dual-aspect monism

To mathematical physicist and Anglican priest John Polkinghorne, the psychosomatic nature of human persons is best understood in terms of a "dual-aspect monism," in which matter and mind are complementary aspects of a unitary being (Polkinghorne, 2009). He is sure that we're not simply matter, that reality is more than just ideas, and that none of the classical solutions seem to correspond to our experience.

In fact, Polkinghorne argues that classical materialism, idealism and Cartesian dualism all exhibit a bankruptcy in the face of the many-layered, and yet interconnected, character of our encounter with reality. This recognition encourages the search for some form of dual-aspect monism—similar theories are called "double-aspect theories"—an account that would acknowledge the fundamental distinction between experience of the material and experience of the mental but which would neither impose on reality a sharp division into two unconnected kinds of substance nor deny the psychosomatic unity of human beings (Polkinghorne, 2001).

Dual-aspect monism is designed to take seriously both our mental experiences and the material world. It claims that they are related in a very deep and complementary way in that there is only one stuff in the world. Dual-aspect monism seeks to avoid devaluing or subordinating either side. Polkinghorne rejects the charge that dual-aspect monism is a subtle form of materialism, because, he says, "It doesn't treat the mental as being just an epiphenomenon of the material" (Harris, 1998).

To give physical systems the kind of freedom and top-down control that he desires, Polkinghorne recruits complexity theory, with its dualities of parts/whole and energy/information. The intrinsic unpredictabilities present in nature, he states, afford the metaphysical opportunity to consider dissipative systems as exhibiting top–down causality (Polkinghorne, 2009).

Given that in dual-aspect monism there cannot be a nonphysical soul, much less an immortal soul, how does Polkinghorne account for the eschatological requirements of his strong Christian faith, especially the biblical resurrection of the dead? How might resurrecting the body and reconstituting the "soul" work?

Speaking on *Closer To Truth*, Polkinghorne asks, "Can you make credible understanding of a destiny beyond death for human beings?" From his theological perspective, he sets two equal and opposite requirements for the afterlife of a soul: continuity, in that the same person must live after death, and discontinuity, in that the afterlife-person must live on forever (Section: Polkinghorne, 2007).

"There is not much point in making Abraham, Isaac and Jacob alive again if they are going to die again," he says. "So, you must have both continuity and discontinuity. Now when you think about the continuity side, what could make those people the same as the ones who lived on earth before? The traditional answer has been the soul, often understood in platonic terms—there is some sort of spiritual bit of us liberated at death that exists and carries on."

Polkinghorne has none of that. "I think that's a mistake," he says. "We are animated bodies, not animated souls. We're not apprentice angels; we are embodied human beings. But if we've lost our 'spiritual soul' [as a resource], have we lost our continuity? I don't think so, but we have to reconceive the soul."

Polkinghorne focuses on the carrier of continuity for a person in this life. "It's quite difficult," he says; "here am I, an aging, balding academic—what makes me the same person as that little boy with the shock of black hair in the school photograph of many years ago? It's not atomic-material continuity: the atoms in my body are totally different than the atoms in that schoolboy's body."

"It cannot be the atoms," he continues, "but it is the pattern of how some of those atoms are organized, in some extraordinary, elaborate, and complex way." That, Polkinghorne states, is "what I think the human soul is. The soul is the information-bearing pattern; that's the real me" (Polkinghorne, 2007).

Thus, Polkinghorne reconceives the "soul" as an information-bearing pattern that is encoded by and carried in the body/brain, and which is dissolved at death along with the dissolution of the body. However, this unique pattern, this real me, is retained in the divine memory for re-embodiment at the resurrection of the dead (Polkinghorne, 2003). During this post-death, pre-resurrection state, this (reconceived) "soul" has no consciousness and no awareness.

"God will remember the pattern, not lose it," Polkinghorne says, and ultimately, God "will reconstitute that pattern in an act of resurrection."

That's the continuity side of things. The discontinuity side, Polkinghorne says, "is that I'm not made alive again in order to die again, so while I'm going to be embodied, I must be embodied in some new form of matter. And it is perfectly coherent to believe that God can bring into being such a new form of matter" (Polkinghorne, 2007).

To Richard Swinburne, the idea of afterlife existence germinating from a renewed instantiation of the pattern of information that we had when living on Earth is problematic. "The trouble is not merely how could God, if God so chose, bring into [renewed] existence a being with a specific pattern of information, but rather that God could [therefore] bring into existence a few thousand such beings. But because only one of them could be me, a pattern of information provides no additional criterion for distinguishing which one that would be. And whatever the extra criterion is, it would have to be such that there [logically] could only be one instance of it at one time. And if we have such a criterion, then what need is there for the pattern of information to be the same as a previous pattern?" (Swinburne, 2016; Kuhn, 2016b).

14.6. Teilhard de Cardin's evolving consciousness

The Jesuit philosopher/theologian and paleontologist Pierre Teilhard de Chardin envisioned the evolution of consciousness as axial in a grand cosmic system of continuing complexification where consciousness becomes planetized and even "God" is an emergent in a process of "theogenesis" (Delio, 2020). Teilhard helped coin the concept of a "noosphere," describing "the layer of mind, thought and spirit within the layer of life covering the earth" (Teilhard de Chardin, 1964).

According to theologian (and former neuroscientist) Ilia Delio, Teilhard has the total material universe "in movement toward a greater unified convergence" such that "as life systems unite and form more complex relationships, consciousness rises." Teilhard, she says, "speaks of evolution as the rise of consciousness toward a hyper-personalized organism, what he called an irreversible personalizing universe." He speaks of "the human person as a co-creator. God evolves the universe and brings it to its completion through the human person." Now the computer, according to Teilhard, "has evoked a new level of shared consciousness, a level of cybernetic mind giving rise to a field of global mind through interconnecting pathways" (foreshadowing the internet) (Delio, 2021).

Teilhard was a dual-aspect monist. He "considered matter and consciousness not as two substances or two different modes of existence, but as two aspects of the same cosmic stuff." Mind and matter "are neither separate nor is one reducible to the other, and yet neither can function without the other." From the Big Bang onward, Delio says, Teilhard has "a 'withinness' and 'withoutness,' or what he called radial energy and tangential energy. Consciousness is, in a sense, the withinness or 'inside' of matter, and attraction is the 'outside' of matter; hence, the energy of matter is both attractive (tangential) and transcendent (radial)." The complementarity of mind and matter is said "to explain both the rise of biological complexity and the corresponding rise of consciousness." Teilhard identifies "the core energy of the universe as love, which both unifies and transcends by way of consciousness. The greater the exterior levels of physical complexity, the greater the interior levels of consciousness" (Delio, 2021).

To Teilhard, evolution describes "the dynamic impulse in life toward

more being and consciousness" and that which drives evolution is consciousness. In short, "evolution is the rise of consciousness." Following Julian Huxley, he writes that the human person "is nothing else than evolution become conscious of itself"—and adds, "The consciousness of each of us is evolution looking at itself and reflecting upon itself" (Teilhard de Chardin, 1959). The human person is "the point of emergence in nature, at which this deep cosmic evolution culminates and declares itself" (Delio, 2021).

Moreover, "the presence of mind in matter and the openness of matter to greater wholeness is the religious phenomenon of nature." Radically unorthodox, Teilhard sees this reality as the incarnation of God, where "God and world are in a process of becoming a new reality together." Simply put, Delio says, "we cannot speak of God apart from human evolution, an idea that led Teilhard to state that God and world form a complementary pair. God and world are entangled with one another to the extent that talk of God is impossible apart from talk about nature and creative change, and talk of nature makes no sense apart from God" (Delio, 2021).

In summary, Teilhard describes "matter as the matrix of consciousness." He posits "the law of complexity-consciousness" as a fundamental principle of evolution, and conversely, "evolution is fundamentally the rise of consciousness." Moreover, the human person is "evolution become conscious of itself," with the ultimate goal of "the maximization of thought" whereby consciousness radiates "throughout the whole, in every aspect of the cosmos," and then of "self-reflective consciousness," whereby "the human person can stand apart from the world and reflect on it" (Delio, 2023, pp. 30–32).

Finally, the foundation of Teilhard's paradigm is "Omega," which he sees as the "prime mover of evolution," the unifying power in evolution. Omega works its guiding magic from the very beginning of things, "acting on pre-living cosmic elements," moving into consciousness as it emerged as the goal toward which evolution complexifies and converges. "Omega is the absolute whole," making "wholeness in nature not only possible but also intensely personal. Teilhard identifies Omega with God" (Delio, 2023, p. 35).

14.7. Atmanspacher's dual-aspect monism

Physicist-philosopher Harald Atmanspacher presents mind and matter, mental and material domains of reality, as manifestations, or aspects, of one underlying, fundamental reality in which mind and matter are inseparable. He distinguishes between the epistemic discernment of both the separate domains and the underlying reality, and the ontic existence of the "psychophysically neutral domain" (Atmanspacher, 2020a).

He also distinguishes two classes of dual-aspect theories based on "the way in which the psychophysically neutral domain is related to the mental and the physical." In Russellian monisms, "the *compositional* arrangements of psychophysically neutral elements decide how they differ with respect to mental or physical properties. As a consequence, the mental and the physical are reducible to the neutral domain" (Atmanspacher, 2020a).

Whereas in *decompositional* dual-aspect theories, "the basic metaphysics of the psychophysically neutral domain is holistic, and the mental and the physical (neither reducible to one another nor to the neutral) emerge by breaking the holistic symmetry or, in other words, by making distinctions. This framework is guided by the analogy to quantum holism …. [which is] based on speculations that clearly exceed the scope of contemporary quantum theory."

Atmanspacher establishes connections between the ontic and epistemic domains of dual-aspect theory and David Bohm's famous notions of implicate and explicate order (11.3). "Mental and physical states emerge by explication, or unfoldment, from an ultimately undivided and psychophysically neutral implicate, enfolded order." This order is dynamic, not static, as in Whitehead's process philosophy (Atmanspacher, 2020a). Atmanspacher finds dual-aspect potency in the conjecture by quantum physicist Wolfgang Pauli and analytical psychologist Carl Jung on the concept of synchronicity and draws on dual-aspect elements from the two disciplines (17.2; Double-aspect theory, 2023)

In other words, Atmanspacher's dual-aspect theory hypothesizes that mental and material manifestations may inherit mutual correlations because they are jointly caused by the psychophysically neutral level. Such correlations, he says, would be "remnants reflecting the lost holism of the underlying reality" (Atmanspacher, 2020a).

Atmanspacher and philosopher of physics Dean Rickles extend the metaphysical position of dual-aspect monism by aligning "the deep structure of meaning" as "a fundamental feature of the nature of reality," stressing that "the decompositional version of dual-aspect monism considers the mental and the physical as two aspects of one underlying undivided reality that is psychophysically neutral." Crediting their forerunners (Wolfgang Pauli, Carl Jung, Arthur Eddington, John Wheeler, David Bohm, and Basil Hiley), the authors "reconstruct the formal structure of these approaches, and compare their conceptual emphases as well as their relative strengths and weaknesses." Their intent is to establish dual-aspect monism as a scientifically and philosophically robust alternative to physicalism, dualism and idealism (Atmanspacher and Rickles, 2022).

14.8. Ramachandran's new physics and neuroscience

Neuroscientist V.S. Ramachandran states that the question of consciousness cannot be answered "in any obvious terms." Most neuroscientists don't think about the question of consciousness, as it doesn't typically arise in neuroscience or in physics. But, he says, the ancient Vedic texts of India do address the problem of consciousness, the problem of qualia (Section: Ramachandran, 2019).

"Physics, by definition, is a third-person description of the world; its laws have no subjective quality at all." Physics has different wavelengths of electromagnetic radiation, but "you see colors: where does these come from? Consciousness emerges only in a first-person description of the world. I see red; not red is seen by me. I see red!"

"How can physics, including neuroscience, be a complete description of the world if it excludes my primary sensory experience, if it does not admit a first-person perspective?" Ramachandran asks. (He considers neuroscience a branch of physics.) "That I'm looking at the cosmos from here now has no privileged status in science. For me, I have a privileged status. How is that possible? That's the problem."

"We need a new hybrid discipline, physics and neuroscience, that includes consciousness," Ramachandran asserts. "Consciousness is part of reality, but how it entwines with physical laws needs to be explored" (Ramachandran, 2019).

14.9. Tegmark's state of matter

Physicist Max Tegmark speculates that "the subjective experience that we call consciousness is the way information feels when being processed in certain complex ways," and he comes to this strong physicalist view because his starting point is that "It's all physics." This means, he says, "I'm not allowed to have any extra 'secret sauce' to add to the physical world and brain. Thus, explaining consciousness is much harder for me, but at the same time, it [i.e., the physicalist constraint] limits or focuses my work to or on very concrete problems" (Tegmark, 2014a).

Clearly, Tegmark says, "there must be some additional principle about information processing in nature that distinguishes between the conscious kind and the unconscious kind." "I would love to find it," he continues, "not just because it's philosophically fascinating, but because it's important. Assessing consciousness is a critical need, whether in caring for comatose patients or in communicating with super-advanced AI" (Tegmark, 2014a).

Tegmark examines the hypothesis that consciousness can be

understood as a "state of matter," "perceptronium", as he coins it, with distinctive information-processing abilities (Tegmark, 2015). Assuming that consciousness is a property of certain physical systems, with no "secret sauce" or non-physical elements, and given that the key difference between a solid, a liquid and a gas lies not in the types of atoms, but in their arrangement, he conjectures that consciousness can be understood as yet another state of matter. Just as there are many types of liquids, he says, there are many types of consciousness.

To distinguish conscious matter from other physical states of matter, Tegmark explores four basic principles: "the information, integration, independence, and dynamics principles." These principles may identify conscious entities, account for our three-dimensional world, even involve the emergence of time. Tegmark's approach generalizes Giulio Tononi's Integrated Information Theory (12) for neural-network-based consciousness as well as for arbitrary quantum systems.

Founded on his concept that mathematics is the ultimate nature of reality (Tegmark, 2014b, 2014c, 2014d), Tegmark's quest is to better understand the internal reality of our mind and the external reality of our universe, such that they will hopefully co-explain or at least assist each other. This view sits somewhat apart from most materialist theories of consciousness, in which the emergence of consciousness is a contingency of evolution.

14.10. Qualia Research Institute's state-space, qualia formalism, valence realism

The Qualia Research Institute (QRI), a not-for-profit pursuing unique approaches to the science of consciousness, stresses "Qualia Formalism," the hypothesis that the internal structure of our subjective experience can be represented precisely by mathematics, and "Valence Realism," the central importance of emotion/affect, that is, valence (how good or bad an experience feels) as a real and well-defined property of conscious states (Qualia Research Institute). Within the formalism, symmetry is said to play a significant compositional, functional, and aesthetic role. It is called the Symmetry Theory of Valence (proposed by philosopher Michael Edward Johnson): the symmetry of an information geometry of mind corresponds with how pleasant or unpleasant it is to be (or have) that experience. ("The biggest mystery hiding in plain sight is what gives experiences valence.") (Johnson, 2023).

The key QRI move (or assumption) is that every distinct state of conscious experience is unique and can be described mathematically; the number of such states, a "combinatorial explosion of unexpected phenomena," is an unimaginably vast (but not infinite) "state-space of consciousness," which is an independent, quasi-dimensional aspect of reality that grows "supergeometrically." It is the specific geometry of each state-space of consciousness that *is* the conscious percept; each experience would correspond to a single point in the state-space of consciousness; the set of all possible experiences are organized in such a way that the similarities between experiences are encoded in the geometry of the state-space; and the degrees of symmetry or lack of symmetry of the geometry reflect the balance of positive and negative valence, both reflecting brain harmonics which somehow interact with the quasi-dimensional state-space and its symmetries (Shinozuka, 2020). (The "state-space of consciousness" resonates with a similar kind of structure in Integrated Information Theory, 12.)

QRI says its position is close to dual-aspect monism or neutral monism. It is committed to an extended physicalism in the sense that extended laws of physics ultimately must describe fields of qualia. Included is the idea that emotional valence (the pleasantness/unpleasantness of an experience) is a natural kind, a real division of the world carved at its joints, which is said to provide substantial information about phenomenology (Qualia Research Institute, n.d.).

QRI rejects functionalism as creating confusion but considers exotic states of consciousness as important data points for reverse-engineering the underlying formalism for consciousness. As noted, QRI is most compatible with, but not synonymous with, Integrated Information Theory (12), which QRI calls the first mainstream theory of consciousness to satisfy a Qualia Formalist account of experience. QRI leverages the idea from Integrated Information Theory that for every conscious experience, there is a corresponding mathematical object such that the mathematical features of that object are isomorphic to the properties of the experience, and that without this idea, no matter the neurobiological theory, we cannot solve the hard problem of consciousness (Qualia Research Institute, n.d.).

14.11. Bentley Hart's monism: consciousness, being, God

Philosopher, theological scholar, and intellectual provocateur, David Bentley Hart, constructs an ultimate unified monism, first by showing that consciousness/mind and being/existence are profoundly inseverable. He argues that "rational thought and coherent order are two sides of a single reality," and that only by embracing God "as the absolute unity of consciousness and being," can the one ontological reality be confirmed (Hart, 2022b). In a sense, it is a higher-order monism. Oversimplified, an idealist form of panpsychism (Hart, 2021a).

Hart is not a timorous monist: "At the end of the day, I'm a monist as any sane person is … any metaphysics that is coherent is ultimately reducible to a monism" (Hart, 2024).

Unsurprisingly, Hart is a fierce critic of materialism (Hart, 2019a): "The incommensurability between physical causation and mental events is so vast that one can confidently assume that no purely physical explanation of their relation will ever succeed" (Hart, 2021a). He argues that it would be very odd to claim that physiology and mental agency can be characterized within the same "mereological hierarchy." Far from being inverse descriptions of one and the same causal structure, he says, "the causal description peculiar to each sphere—the material and the mental—is not even vaguely similar to that peculiar to the other. If the mental merely supervened physically upon the material, in the way the shape of the wheel supervenes upon the wheel's iron molecules, it is impossible coherently to conceive of that miraculous conjugation as merely a structural extension of inherent physical propensities. Here each level operates in ways radically disparate from—even contrary to—the ways in which the other operates. Material structures and forces, if the reductionist picture of nature is correct, are composite, fragmentable, non-purposive, non-intentional, and essentially third-person; mental agency, by contrast, is indivisibly unified, physically infrangible, thoroughly teleological, inherently intentional, and irreducibly first-person (that is, conscious)" (Hart, 2019a, 2022a, 2022d).

Hart is certain that "nothing like an actual science of mental reality will ever be conceivable (much less practicable) so long as the culture of the sciences clings to a belief in the principle of the 'causal closure of the physical'" (Hart, 2021b). He rejects irreducible emergence as "logical nonsense; whatever properties appear in an effect, unless imposed adventitiously, are already implicit in its 'lower' causes, even if only as a kind of virtual intentionality." He avers that "'Strong emergence' is either a myth, a category error, or a truth so bizarre as to suggest that truth as such is impenetrable to reason; to invoke such a principle is to say nothing" (Hart, 2022a). He recommends reconsidering "something like causal language proposed in Aristotelian tradition" (Hart, 2022b).

Hart's intuition is that "The conditions necessary for knowledge of the world and the conditions necessary for the world's existence as an object of knowledge at any number of vital points seem insensibly to merge into a single reality, a single act," a simplicity and an ultimacy, he says, that cannot be found within nature as a closed totality and cannot be consistent with any physicalist theory of the world. It becomes impossible not to wonder, he continues, "whether the only properly empirical approach to the question of mental reality should begin with a radically different kind of methodological bracketing: one that suspends every presupposition regarding a real distinction between epistemology and ontology."

He continues, "At least, we should never refuse to reflect upon the ancient metaphysical quandary of whether being and consciousness are

ever truly severable from one another." To exist fully, he says, is "to be manifest to consciousness," and "there is no such thing as ontological coherence that is not a rational coherence," such that the irreducibility of mind to physical causes and the irreducibility of being to physical events are one and the same irreducibility. There is a point then, Hart argues, "at which being and intelligibility become conceptually indistinguishable" and "being in itself is pure intelligibility" (Hart, 2022b).

Given that "world and mind really are open to one another," Hart accords "a certain causal priority to mind over matter in our picture of reality" in that materialism would have more difficulty to account for consciousness than consciousness would for matter.

Hart invokes Bernard Lonergan's argument that the "unrestricted intelligibility" of reality leads to God as the one "unrestricted act of understanding." The ascent towards ever greater knowledge is, Hart says, "an ascent towards an ultimate encounter with limitless consciousness, limitless reason, a transcendent reality where being and knowledge are always already one and the same, and so inalienable from one another" (Hart, 2022b).

"A restricted instance of that unrestricted act," Hart says, is his "best definition of mind." He then goes to God, reasoning that "every act of conscious, unified, intentional mind is necessarily dependent upon infinite mind—which is to say, God." God, then, is "the logical order of all reality, the ground both of the subjective rationality of mind and the objective rationality of being …. the one ontological reality of reason as it exists both in thought and in the structure of the universe" (Hart, 2019b, 2022b).

The final step in forming Hart's ultimate monism will seem strange to most, blasphemous to some: taking consciousness and being, already one and the same, and unifying it with God, to become, all together, the ultimate one and the same. This is not pantheism (or panentheism), but based on Hart's Orthodox Christian convictions, a Christological monism. He quotes Maximus the Confessor, who says, "in the union with God, we ultimately are destined to become uncreated." In Hart's ultimate monism, "God doesn't become God, but God in those who are becoming God" (Hart, 2022c).

14.12. Leslie's consciousness inside an infinite mind

Philosopher John Leslie suggests that ethical requirements, when not overruled by stronger ethical requirements, are creatively effective. The cosmos they create is a collection of infinitely many minds, each infinite mind eternally conscious of all that's worth contemplating. Our universe is a structure inside one such mind, its reality consisting simply in its being contemplated. (Infinitely many finer universes might join our universe in that mind's consciousness, but it does at least deserve its place there.) (Leslie, 2001).

How, though, would one's own consciousness fit into this scenario? Well, each infinite mind is "a single existent" in this sense, that its ingredients stand to it somewhat as a ruby's shape and its redness stand to the ruby; they couldn't exist independently, any more than could the particles in the Bose-Einstein condensates described by quantum physics. But despite how all the parts of each universe which any such mind contemplated would exist—remember, solely through entering into that mind's contemplations—some of those parts could each have consciousness of its own. They could be conscious brains, or conscious computers. Being inside the existential unity of that mind wouldn't make these know that it was there that they existed, or what other things existed there. Conscious, when it contemplated us, of every quark and electron of your brain and mine, that mind could leave us in ignorance even of each other's existence (Leslie, 2001).

Similarly, our lives from birth to death could be eternally present to that mind's awareness whereas we could only guess what would fill our next few hours. Still, one's consciousness might itself be existentially unified at any given moment, perhaps thanks to quantum-physical processes. This could explain how the entirety of a painting, for instance, can be known in a single glance. Brains without regions that featured quantum computations, computers which weren't quantum computers, might be incapable of such knowledge.

Leslie concludes, "Innumerable further things worth contemplating would exist inside each infinite mind, many of them quite unlike our universe and its living beings. Examples could be utterly lifeless universes; universes very unlike ours in their physical laws, or obeying no laws at all; countless things of interest or of beauty, each not forming part of any universe" (Leslie, 2001).

15. Dualisms

Dualism is the theory of consciousness that requires two radically distinct parts: a physical brain, obviously, but also in addition, a separate, nonphysical substance that is not only independent of the brain but also not of the physical world (as presently conceived). This would mean that reality consists of (at least) two ontological categories—physical and nonphysical, whether substances, properties, aspects, dimensions or planes of existence. Dualism is often called "substance dualism," to distinguish it from "property dualism," which is ontologically different (15.1). In general usage, "dualism" means substance dualism.

For dualism to be true, what follows must be that the physical world, at its most fundamental level of fields and forces, is not in some way causally closed, and that mental properties play a causal role in affecting the physical world. This perspective, often called *interactionism*, provides that physical states cause phenomenal states, and phenomenal states cause physical states, and whatever psychophysical laws there may be will operate in both directions (Chalmers, 2003; 15.8).

Common forms of dualism identify the essence of the person with a nonphysical "soul," generally an immortal soul. This kind of "soul-centered dualism" is also the theory of consciousness most widely believed by the vast majority of the world's population, largely implicitly via acculturation to belief systems, whether organized religion or folk traditions. Dualism (substance dualism), certainly, is the default doctrine in the Abrahamic religions of Judaism, Christianity and Islam.

Dualism is largely rejected by philosophers, at least by most professional philosophers in the West[48] (PhilPapers Survey, 2009, 2020). Dualism has fallen out of philosophical favor for at least four reasons. (i) No Interactions: given the scientific understanding that the physical world is a causally closed system in that every event has a prior, physically efficient cause, how could anything outside such a closed system affect it? (Goff, 2020). (ii) Not Parsimonious: two kinds of world stuffs seem excessively complex; Occam's razor cuts unnecessary entities in explanations. (iii) No Knowledge: souls are slippery; how to know anything about how they work? (iv) Fading Divine Creator: With God less prominent in academia, there seems one less way to create or allocate souls.

In trying to characterize souls (assuming for a moment that souls do exist), we ask questions. Are all souls exactly the same, as all electrons in the electron quantum field are the same? Are souls undifferentiated (everyone gets the same "starter kit"), or specially tailored to each individual? Are souls created by God? Or are souls the inevitable, automatic product of a set of deep psychophysical laws; in other words, given specific, complex structures of atoms, do souls pop into existence? Or are souls always existing, part of a cosmic consciousness—journeying, reincarnating, transitioning, transforming, reincarnating ….?

Notably, because consciousness, under dualism, would require both

[48] The first PhilPapers Survey of philosophy faculty and PhDs, conducted in 2009, reported: Accept or lean toward: Physicalism, 56.5%; Non-physicalism, 25.9%; Other, 16.4%. (Bourget and Chalmers, 2009; PhilPapers Survey, 2009). The latest Survey in 2020 showed a modest but meaningful shift away from Physicalism (51.93%) and toward Non-physicalism (32.08%); Other, about the same (16.56%) (Bourget and Chalmers, 2023; PhilPapers Survey, 2020).

a non-physical substance and a physical brain (somehow working together), it is conceivable, following the death of the body and the dissolution of the brain, that this nonphysical substance by itself could maintain some kind of existence, conscious or otherwise. (Although this nonphysical substance is traditionally called a "soul"—a term laden with theological burdens—a soul is not the only kind of thing, or form, that such a nonphysical substance could be.)

Philosopher Dean Zimmerman reviews "a spectrum of dualisms," resulting from different meanings of "nonphysical". Are souls simple, with no parts, or composite, with internal components (whether fixed or flexible)? To pose an extreme, could souls be abstract objects, outside of space and time, necessary existents? Most dualists would have souls as concrete, nonphysical objects. Some would even have souls extended in space, sharing the same special coordinate system as bodies (Zimmerman, 2005).

David Bentley Hart welcomes confrontation by claiming that most early modern scientists were better able to understand the mind-body problem than are many in the sciences today. The 17th century solution to the seeming irreconcilability of mind and matter was "to adopt a casual and contented dualism, allowing the mental and the physical each its own discrete autonomous sphere: nature, not being teleological or intentional in any way, is nothing like mind; mind, not being composite, purposeless, and impersonal, is nothing like nature." The two can somehow interact, probably, Hart suggests, through the sheer power of God, but "neither is reducible or even qualitatively similar to the other." Hart recognizes the inherent problems in describing "any kind of coherent ontological, causal, or epistemological continuity between the two spheres"—Hart himself is a monist (14.11)—"it [dualism] was nowhere near so magnificent a disaster as the later, materialistically monistic attempts to reduce mental events to mechanical [processes] have so far proved" (Hart, 2019a, 2021a).

To Galen Strawson, "Dualists who postulate two distinct substances while holding that they interact causally not only face the old and seemingly insuperable problem of how to give an honest account of this interaction. They also face the (even more difficult) problem of justifying the claim that there are two substances." To think that dualism has anything in its favor, Strawson asserts, "is simply to reveal that one thinks one knows more about the nature of things than one does—and it has Occam's razor (that blunt, sharp instrument) against it" (Strawson, 2008). The dualism theories that follow in this section challenge this denial.

Jaron Lanier says, "You've got two choices. Either you know everything [about consciousness], or you organize your ignorance in some intelligent and organized manner. Dualism is the most honest manner of organizing your ignorance, okay?" (Lanier, 2007b).

As noted, *Closer To Truth* viewers regularly send me diverse theories related to consciousness, some just ideas, some elaborate systems, and occasionally they are hard to classify. For example, a consciousness system operating independently of the central nervous system, constituted by "a Material B" (exhibiting "coupling properties" beyond the boundaries of physics) and explored by "memory-related thought processes" and "illogical nonlinear-thinking"[49] (Ma et al., 2023).

It is well known that mental causation is a vexing problem for dualists. By what conceivable mechanism could nonphysical stuff effect physical stuff? This is not a primary issue for this Landscape (15.8), but it is for Dualism.

Again, the purpose of this section on Dualisms as a theory of consciousness is to describe various kinds of dualism, not to argue in favor or against (a self-imposed hurdle on which I occasionally trip).

[49] The three Chinese scientists are, inclusively, from Mainland China, Taiwan, and the USA. It is good that consciousness can catalyze harmony.

15.1. Property dualism

Property Dualism is the idea that while there is only one kind of substance in the world, physical substance, there are two kinds of properties, mental and physical properties, such that mental properties cannot be reduced to or explained by physical properties alone, even though both kinds of properties are generated by the same physical thing, namely brains. More specifically, property dualism maintains that human persons are entirely physical objects, composed wholly by the constituents of fundamental physics and subject only to the laws of physics, but also they have, at the same time and equally inherent, nonphysical properties or aspects, namely mental properties or aspects (thoughts, concepts, ideas) that are not reducible to, and not explainable by, the properties of fundamental physics (and its special science derivatives)—even though all of property dualism's properties must come from those constituents of fundamental physics. Simply, human persons would have nonphysical properties but no nonphysical parts.

According to Dean Zimmerman (following Chalmers), property dualism means that, "For at least some mental states, it is not possible to define, in terms of microphysical properties alone, a physical property common to all individuals in that mental state, and only to them." Property dualism, then, would be the failure of supervenience, which states that "among all the possible individuals in all the possible worlds, there is no pair with all the same microphysical properties but different mental properties" (Zimmerman, 2005).

Zimmerman applies property dualism to two famous questions in philosophy of mind: "It seems easy to imagine physically indiscernible zombies (animate human bodies with no consciousness) or people whose spectrum of color experiences is the reverse of one's own. If genuinely possible, these scenarios show that the mental does not supervene upon the physical" (Zimmerman, 2005).

But in a wholly physical world, how could the mental not supervene upon the physical? How could different mental states arise from precisely the same microphysical states (down to the most fundamental physics)? If mental states can so arise, mustn't something be missing, or arbitrary, in the physical world? If mental states cannot so arise, what then of property dualism?

To oversimplify, property dualism is dualistic only in its deep epistemology, not in its deep ontology, which remains entirely materialistic—consciousness remains wholly the product of brain function. Under property dualism, the mind still comes entirely from the brain, without residue. When super-advanced neuroscience accounts for all that can be known about the brain—though obviously it would be fiendishly complex—will there be nothing left over to explain about the mind?

Yet, property dualism has some mental properties as irreducible, a move that perhaps help blunt attacks on materialist theories of consciousness. (Property dualism shares features with Non-Reductive Physicalism, 10.) But what does this really mean? How irreducible? Irreducible in practice, for sure. But irreducible in principle? What would an absolute complete science, from fundamental physics to neuroscience, *not* capture?

Philosopher Ralph Weir evaluates the common preference in philosophy of mind for varieties of property dualism over other alternatives to physicalism and certainly over substance dualism. He argues that the standard motivations for property dualism "lead directly to nonphysical substances resembling the soul of traditional metaphysics." Using the conceivability of modal arguments for zombies and ghosts and critiquing Russellian monist forms of property dualism, he concludes that "if you posit nonphysical properties in response to the mind-body problem, then you should be prepared to posit nonphysical substances as well" (Weir, 2023).

Property dualism is the first subcategory under dualism because it is the most materialistic, the least dualistic, of the bunch. While I appreciate its important role in the development of philosophy of mind, I must admit that I've never had it near top-of-list in the marketplace of

fundamental theories.

Peter van Inwagen muses that "'property dualism' is a very odd name to give it." His argument clarifies the essence of dualism itself. "If there are non-physical substances, then physical and non-physical substances (a cat and an angel, for example) are clean different kinds of thing. Although they are both substances right enough, the division of the category 'substance' into the sub-categories 'physical' and 'non-physical' is an ontologically significant division. We call Descartes and Plato dualists because they think there are substances in both sub-categories. I would suppose that 'property dualists' call themselves dualists because they think that the division of properties into physical and non-physical properties is an ontologically significant division of the category 'property', a division as significant as the physical/non-physical division of the category 'substance'. If this is so, I think that the self-chosen description 'property dualist' indicates a metaphysical confusion in the way property dualists conceive of properties" (Van Inwagen, 2007b).

Nonetheless, unlike much-disparaged substance dualism, property dualism remains a respectable position within philosophy of mind (Zimmerman, 2005).

15.2. Historical and traditional dualisms

Dualism is the oldest and most ubiquitous theory of consciousness in the sense that nonphysical aspects of the world and mind, such as animism and ancestor worship, had long seemed the default assumption of millennia of pre-modern human groups and cultures. Plato's description of immortal souls in ancient Greece, where the person was entirely immaterial, and the profound ruminations about consciousness in ancient India, debating individual and cosmic varieties, were consistent with common intuitions and thus readily accepted.

On the other hand, biblical accounts of the nature of the person, especially in the Hebrew scriptures, stress human physicality and mortality, with no obvious assertions about immortal souls (Van Inwagen, 1995). In Genesis, humans *became* (were not inherently) "a living soul" (Gen. 2:7). Ezekiel writes, "The soul that sinneth, it shall die" (Ezek. 18:20). Paul, in the New Testament, has "the wages of sin is death" (Rom. 6:23). Granted, theologians can interpret "death," as, say, a soul that is separated from God. But the Psalmist is clear, saying of humans, "His breath goeth forth, he returneth to his earth; in that very day *his thoughts perish*" (Ps. 146:4). And Solomon is unambiguous, "the dead know nothing" (Eccles. 9:5).

Nonetheless, the overwhelming majority of adherents to the Abrahamic religions of Judaism, Christianity and Islam, along with most of their religious teachers, assume that human beings are, in essence, a soul and that the soul has some kind of future beyond death.

John Leslie describes the historical understanding of souls as "existentially unified," noting, "When the parts of a soul were viewed as existentially unified at each particular instant, it wasn't thought that God, when manufacturing unified souls, had to do some kind of special mixing involving many separate steps. It was believed simply that souls had, from the moment of their creation by God, the property of being complex yet existentially unified. Many distinguishable elements of such complexity were present when a soul had a thought or an experience, but still, a soul remained existentially unified at each instant and remained the very same soul at successive instants" (Leslie, 2006).

15.3. Swinburne's substance dualism

Christian philosopher Richard Swinburne is a leading advocate of substance dualism (Swinburne, 2013). "If you want to tell the whole story of the world, you must say what objects there are in the world, what substances there are, and what properties they have at different times," Swinburne said on *Closer to Truth*. "Of course, that will include all the physical objects, all the tables and chairs and planets and atoms. But, of course, that won't tell the whole story. You will also have to tell the story of conscious life, which is associated with each body." Swinburne asserts that in order to tell "the whole story of the world," one must "pick out subjects of experience—not just by the experiences they have, not just by the physical bodies with which they are associated" but also with "separate mental entities for which the natural word is 'soul' … If you can't bring 'soul' into the account of the world, you will not tell the whole story of the world, because you will not tell who has which conscious life" (Swinburne, 2007; Swinburne, 2006).

"If the only things were physical objects, including bodies and brains, we would not be able to distinguish a case where you have the body which is presently yours and I have the body which is presently mine, from the case where you have the body which is presently mine and I have the body which is presently yours," he adds. "If physical properties and mental properties were just properties of bodies there would be no difference between these cases; " but because there are obvious differences between "you" and "me," Swinburne claims that "there must be another essential part of me which goes where I go, and this we can call my 'soul.'" Truths about persons, Swinburne stresses, are not truths about brains or bodies (Swinburne, 2007).

Swinburne's argument for the existence of a soul—that "souls constitute personal identity and the continued existence of me will consist in the continued existence of my soul"—"is quite apart from what might happen in the world to come." Moreover, Swinburne's arguments for the reality of a nonphysical soul do not depend, he says, on theological revelation or his own religious convictions (Swinburne, 2016; Kuhn 2016b).

15.4. Composite dualism

Modern dualism in philosophy of mind begins with Descartes who famously divides the world between the physical and the mental. He was motivated by the obvious distinction that the mind has thought but no extension while the body has extension but no thought. Yet body and mind both seem needed to have a human person.

Composite dualists require both body and mind to constitute a person, where "body" generally denotates brain and "mind" generally denotates soul. There are of course variations and problems (Zimmerman, 2005). A key question is whether the nonphysical part, the soul, has mental states independent from the body/brain? To most dualists, both historical and contemporary, the soul does indeed.

As to the relationship between the body and the soul, Swinburne is ambivalent. "Maybe, of course, a soul can't function on its own," he said. "Maybe it can only function when associated with a body. In that case, my continued existence would consist in it being joined to a body again, perhaps an entirely new body. I think a soul could exist on its own, but not a great deal turns on that." A body is required, Swinburne said, because "for us to interact with others, to recognize others, we need different public characteristics" (Swinburne, 2016; Kuhn 2016b).

I asked Swinburne to speculate on the essence or composition of such a soul. Is it a differentiated substance? What's to prevent your soul from getting mixed up with my soul?

"The difference between souls is ultimate, unanalyzable by anything else," Swinburne responded. "A soul has no extension. It is an 'immaterial particular', to use an old-fashioned philosophical term. It does, of course, have characteristics, properties. It has thoughts, feelings, attitudes, and so on. But the way we distinguish in practice between souls is in terms of the bodies with which they are associated because the difference between your soul and my soul, being ultimate, does not consist in their relations to our respective bodies. There is of course nothing paradoxical about the difference between souls being unanalyzable, because some differences must be ultimate; if you can analyze 'a' by 'b' and 'b' by 'c' and so on, you eventually get to things which you can't analyze, and the differences between human souls in my view are one of those things. This is why the only way souls can have a public presence is through their attachment to bodies" (Swinburne, 2007, 2016).

15.5. Stump's Thomistic dualism

The influential Christian scholastic philosopher St. Thomas Aquinas gives an account of the soul that is non-Cartesian in character, according to Catholic philosopher Eleonore Stump, who has Aquinas taking the soul to be something essentially immaterial or configurational but nonetheless realized in material components. This suggests, she argues, not only that Cartesian dualism isn't essential to Christianity but also that the battle lines between dualism and materialism are misdrawn (Stump, 1995).

Stump recognizes that because Cartesian dualism is widely regarded (among philosophers) as false, and because "it is also the case that the major monotheisms have traditionally been committed to dualism of a Cartesian sort, then in the view of many philosophers the apparent or putative falsity of Cartesian dualism becomes an embarrassment for those religions."

In building his alternative to a Cartesian sort of dualism (in historical context, to Plato's account of the soul), Aquinas is guided by "two complex, culturally conditioned sets of intuitions," each of which relates to a biblical passage. The first is "dust thou art, and unto dust shalt thou return" (Gen. 3:19), conveying that a human being is a material object, "made out of the same sort of constituents as the earth is," and the second is "Then shall the dust return to the earth as it was, and the spirit shall return to God who gave it" (Eccles.12:7), conveying that a human person survives death, "because her spirit or soul continues to exist after the dissolution of her body." Stump has Aquinas accommodating both sets of intuitions with his account of the human soul (Stump, 1995).

Famously, Aquinas takes the soul to be the form of the body, but, as Stump points out, "the soul not only is the form that makes this matter a living human body but also is the form that makes the matter this human being." And when, after death, all that is left of a human being is the soul, "individuality persists on Aquinas's account."

"Soul" is a larger category for Aquinas, his generic term for the substantial forms of all material objects that are living. Plants have souls, not in the human sense, but in that they enable "a configuration of matter which allows for nutrition, growth, reproduction." Animals, too, have souls, since they, too, are living things; but the configuration of their matter also allows them perception. The forms that constitute human beings allow a more distinctive set of capacities, namely, intellective processes. Aquinas tends to call the human soul "the intellective soul" or "the rational soul".

Aquinas's soul is created directly by God and infused into matter. The soul is the act of the body, "because it is in virtue of the soul that something is actually a living human body." Moreover, because the soul is the form of the body, it has a spatial location; while the body is alive, the soul is located where the body is.

As for the post-mortem, disembodied soul, while it does persist, it is not the complete human being who was the composite but only a part of that human being. A separated soul does exist on its own after death, but it nonetheless isn't a substance in its own right. Disembodied existence isn't natural to the soul.

Stump sums up: "The soul is an essentially configurational state which is immaterial and subsistent, able to exist on its own apart from the body. On the other hand, the soul is the form that makes the living human body what it is. While it is possible with divine help for the soul to exist and exercise cognitive function on its own, apart from the body, that state is unnatural to it. In the natural condition, human cognitive functions are to be attributed to the whole composite and not to the soul alone, although the composite exercises cognitive functions by means of the soul." In Stump's view, the real lesson of Aquinas's account of the soul is to show that the dichotomy between materialism and dualism is misleading (Stump, 1995).

15.6. Feser's neo-Thomistic, neo-Aristotelian, common-sense dualism

Catholic philosopher Edward Feser's account of consciousness combines a neo-Thomistic view that some mental faculties are immaterial and a neo-Aristotelian view that we perceive the world actually as it appears to be (i.e., direct realism, such that color and sound are properties of external objects as real as size and shape) (Section: Feser, 2012a; 2012b; 2012c; 2022a; 2022b).

As Feser explains, Aristotelians and Thomists use the term "intellect" as that faculty by which we grasp abstract concepts, make judgments and reason logically. Intellect is to be distinguished from "imagination," the faculty by which we form mental images (visual, auditory, etc.), and from sensation, the faculty by which we perceive the external material world and the internal world of the body. Feser argues that the irreducibility of intellect to imagination and sensation is undeniable (e.g., the intellect's concepts are universals while mental images and sensations are particulars). He also argues that "the reason why intellectual activity cannot in principle be reduced to sensation or imagination is, as it happens, related to the reason why intellectual activity cannot in principle be reduced to, or entirely supervenient upon, or in any other way explicable in terms of material processes of any sort" (Feser, 2012a).

To explain intellectual activity entirely in terms of material processes, Feser says, is to inevitably deny the existence of some essential aspect of the intellectual activity. If you identify thought with material processes, you are necessarily committed to denying, implicitly or explicitly, that our thoughts really ever have any determinate or unambiguous content. According to Feser, some materialists have seen this, including Quine and Dennett, and decided "to bite the bullet and accept that the content of all thought and language is inherently indeterminate."

Feser asserts that such claims are indefensible because it would contradict making sense of mathematics and logic, and hence of empirical science, all of which presupposes that we have determinate concepts. "Anyone who thinks that thought can even in principle be entirely material," he says, "hasn't thought carefully enough about the nature of thought" (Feser, 2012a).

But Feser's dualism is not Descartes's dualism, which makes assumptions about the nature of matter as much as or more than assumptions about the nature of mind, and thus is responsible, in part, for generating the mind-body problem. The key point, Feser says, is that by characterizing matter in purely quantitative, mathematical terms, Descartes left no place in it for qualitative features like color, odor, taste, sound, smell, heat and cold as common sense understands them. Accordingly, he treated these qualitative features—as Galileo before him and countless others after him did—as entirely mind-dependent, existing only in our conscious experience of the world but not in the world itself (Feser, 2012b).

This means that if these qualitative features as common sense understands them exist only in the mind and not in the material world, it follows that these features cannot themselves be material. A kind of dualism follows, Feser claims, precisely from the materialist conception of matter. The so-called "qualia problem" that contemporary philosophers of mind fret over, he argues, "is the inevitable result of the conception of matter to which modern scientists in their philosophical moments have wedded themselves" (Feser, 2012b).

In Feser's reading, Descartes and other moderns had an austere concept of nature as inherently devoid of the qualitative features we know from conscious experience (e.g., color, sound, heat, cold) as well as of meaning or purpose of any kind. Thus, they conceived of the human mind as an immaterial substance that somehow interacts with those parts of the natural world we call human bodies and brains. This spawns Descartes's novel form of dualism, which is notoriously problematic (i.e., the interaction problem) such that modern materialists throw out Descartes's immaterial substance while holding on to his view of the material world. (But their own position, Feser adds, is even more problematic, since it leaves them with no place at all to locate qualitative features or meaning.) (Feser, 2012c).

Moreover, because Descartes took the human body as just one

entirely mathematically definable bit of the material world among others, entirely devoid of qualitative features, and took all consciousness to reside in the *res cogitans*, which he regarded as immaterial, Descartes's position implies that sensation and imagination are immaterial. Hence if sensation and imagination turn out to be material after all, it is understandable how some would infer that all operations of the *res cogitans*, all mental activity, might be susceptible to materialist explanation as well (Feser, 2012b).

But, Feser argues, the Aristotelian tradition has always regarded sensation and imagination as corporeal faculties, and as having nothing essentially to do with the reasons why our distinctively intellectual activities are incorporeal, in that strictly intellectual activity on the one hand and sensation and imagination on the other, differ in kind, not merely in degree, so that to establish the corporeal nature of the latter is irrelevant to the question of whether the former is corporeal.

Aristotle and the Scholastic tradition that built on his thought took the common-sense view that the natural world is filled with irreducibly different kinds of objects and qualities: people; dogs and cats; trees and flowers; rocks, dirt, and water; colors, odors, sounds; heat and cold; meanings and purposes (Feser, 2012c). The founders of modern philosophy and science overthrew Aristotelianism, and, on Feser's view, common sense along with it. On the new view of nature inaugurated by Galileo and Descartes, the material world is comprised of nothing more than colorless, odorless, soundless, meaningless, purposeless particles in motion, describable in purely mathematical terms. The differences between dirt, water, rocks, trees, dogs, cats, and human bodies are on this view superficial.

Common sense, Feser says, takes ordinary physical objects to have both (a) size, shape, motion, etc. and (b) color, sound, heat, cold, etc. Early modern philosophers and scientists characterized features of type (a) as "primary qualities" and features of type (b) as "secondary qualities," and they argued that the latter are not genuine features of matter as it is in itself, but reflect only the way conscious awareness *presents* matter to us. What exists in mind-independent reality is nothing more than particles in motion. Color, sound, taste, odor, etc. exist only in the mind's experiences of that reality (Feser, 2022a).

But, Feser argues, to draw a sharp distinction between primary and secondary qualities is much more difficult than it at first appears. The Aristotelian philosopher who defends common sense would say that this is a good reason to think that secondary qualities are, after all, as objective as primary qualities.

The more common approach, however, was to try to make some version of the primary/secondary quality distinction work, which made a Cartesian sort of dualism an inevitable consequence of the primary/secondary quality distinction. For if color, sound, heat, cold, etc. as common sense understands them don't exist in *matter*, then they don't exist in the *brain* or the rest of the body (since those are material). And if they do nevertheless exist in the *mind*, then we have the dualist conclusion that the mind is not identical with the brain or with any other material thing.

Feser claims that the very conception of matter that modern materialism has committed itself to is therefore radically incompatible with materialism. Attempting to develop a materialist account of consciousness *while at the same time* presupposing the conception of matter inherited from Galileo and Co. is like trying to square the circle. "It is a fool's errand," Feser opines, "born of conceptual confusion and neglect of intellectual history" (Feser, 2022a).

To Feser, the hard problem of consciousness is a pseudo-problem. It arises only if we follow Galileo and his successors in holding that color, odor, sound, heat, cold, and other "secondary qualities" do not really exist in matter in the way common sense supposes them to, but instead exist only in the mind (as the qualia of conscious experience) and are projected by us onto external reality. If you take this position, Feser says, you are stuck with a conception of matter that makes it impossible to regard consciousness as material.

The solution, Feser offers, is simply not to go along with this assumption in the first place, but to return to the Aristotelian-Scholastic view the early moderns reacted against, and which is compatible with the commonsense view of matter. The so-called hard problem of consciousness then dissolves (Feser, 2022b).

Feser highlights Gilbert Ryle's critical characterization of Descartes's dualism as the theory of the "ghost in the machine." It is often supposed that modern philosophy and science after Descartes preserved his mechanical model of matter while getting rid of the "ghost" of the Cartesian mind. To Feser, the haunting problem is not the "ghost" but the mechanical model of matter (Feser, 2022b).

15.7. *Moreland's Christian soul*

Christian philosopher J.P. Moreland defines a robust "generic substance dualism" as the view according to which "(i) there is a substantial soul (self, ego, I, substantial form) that is wholly immaterial; (ii) the soul is not identical to its physical body; and (iii) the soul is that which grounds personal identity for human persons" (Moreland, 2023). He defends a Thomistic-like dualism, taking the body to be an ensouled, spatially extended, physical structure, and the soul to be a substantial, unified reality that informs (gives form to) its body, animates it and makes it human. Thus, a body requires a soul to be a body, and this is why a body is of value. A body without a soul in it is just a corpse. In contrast to a body, a corpse is of little intrinsic value (Moreland, 2014).

Similarly, a soul requires a body to be fully realized; for a soul to have a body is its natural state. By analogy, the soul is to the body like God is to space—it is fully "present" at each point within the body. Breaking the analogy, Moreland's soul and body relate to each other in an informing and cause-effect way (Moreland, 2014).

Moreland argues that the unity of consciousness cannot be explained if a person is a brain, because a brain is just an aggregate of different physical (separable) parts. He accepts constituent realism regarding properties (and relations), according to which properties (and relations) are universals that, when exemplified (they need not exist), become constituents of the ordinary particulars that have them. Moreover, he asserts that whereas a physicalist may claim a unified awareness of one's visual field consists of combining several different physical parts of the brain each terminating a different wavelength, each of which is aware of only part (not the whole) of the complex view, "this cannot account for the single, unitary awareness of the entire visual field" (Moreland, 2018).

Offering "a comprehensive defense of contemporary substance dualism," Christian philosophers Brandon Rickabaugh and J.P. Moreland present arguments that they claim support substance dualism and defeat those that deny it. These include: introspection, self-awareness and intentionality; the fundamental unity of conscious beings (e.g., mereological essentialism and the diachronic endurance of the soul); and updated arguments from modality and libertarian freedom (e.g., problems of causal interaction, neuroscientific objections, and causal closure of the physical) (Rickabaugh and Moreland, 2023).

15.8. *Interactive dualism*

The primary problem of Dualism—many would say the *defeater* of Dualism—is how nonphysical substances could possibly interact with physical substances, especially given the common assumption that the physical world is a closed system. Also called the "pairing problem," how could an immaterial thing, the mind, interact with a material thing, the body (or brain)? Notwithstanding our folk perception that the physical world affects my mind through my senses and my mind affects the physical world through my actions, most scientists and philosophers deny this is what is in fact happening. There would be no commonalities between physical and nonphysical substances, no means of exchange—the problem of mental causation on steroids. Moreover, if nonphysical substances could somehow affect and alter physical substances, wouldn't that require a transference of energy, and wouldn't

such an addition violate the sacrosanct physical law of the conservation of energy? (Section: Robinson, 2023; Interactionism, 2023).

Advocates of Interactive Dualism (not that there are many among scientists and philosophers) say they have resources. They reject the weak dualism of Epiphenomenalism where the physical affects the mental but the mental does not affect the physical (9.1.2). They can claim that the interaction problem is founded on archaic 19th century, billiard-ball physics, where causation requires hard substances to be in physical contact, to touch one another, as it were. Quantum mechanics, on the other hand, allows for various, albeit speculative ways, for the mental to affect the physical, even beyond the classic but controversial view that an "observer" is needed to "collapse" the wave function. Moreover, because quantum mechanics introduces fundamental uncertainty into the universe, and if by this indeterminism holds, nonphysical substances might enjoy "wiggle room" to effect causation.

Advocates can also appeal to different kinds of ethereal forces or energy transference systems. Perhaps mental powers can influence the *distribution* but not the quantity of energy in the brain ("a little more here, a little less there" does seem a bit of a cheat). Perhaps each individual brain is not a causally closed system so that the conservation of energy need not apply. Perhaps causal closure for the entire universe is also a 19th century invention, based on classical thermodynamics and statistical mechanics, which are now superseded by quantum mechanics, general relativity, dark matter, dark energy, and who knows what else? (I can make up another. Since string theory offers, depending on flavor, 10, 11 or 26 "compactified" extra dimensions, why couldn't nonphysical substances work via these extra dimensions? I can conceive of a precedent for this. To account for the "hierarchy problem" in physics, where gravity is vastly weaker than the other fundamental forces, some postulate that gravity "leaks" or "bleeds" into these extra dimensions.) It gets crazy.

That's not all. Perhaps, one could just blow away the interaction problem by just asserting that in systems that have minds, the law of conservation of energy is false. Perhaps because downward causation goes to the lower physical levels and emergence is enabled, the causal completeness of physics is wrong (Ellis, 2019). Further, because the whole idea of a closed physical system is based on the assumption that there are no nonphysical forces involved, wouldn't this assumption undermine the argument against interaction by making it circular? Then there is "overdetermination," where mental and physical factors can each, independently, affect actions—an approach that, while possibly solving one problem, creates other problems (Robinson, 2023; Interactionism, 2023).

Finally, there is always a theological solution. God can help. God could have created souls with powers, especially since "real" (i.e., libertarian) free will is an essential part of "God's plan," such that neither conservation of energy nor determinism holds, at least with respect to minds. (It is challenging how even God could make this coherent.)

Christian philosopher William Lane Craig describes himself as a "dualist-interactionalist" in that "the brain is itself part of... the physical reality with which the soul immediately interacts (Craig, 2015). He argues that even though souls do not have spatial locations, "the question becomes why we should think that only spatial relations can pair a cause with its effect. Prima facie this seems overly restrictive" (Craig, 2023).

I mustn't forget "Occasionalism," the idea that created substances, physical and nonphysical, cannot be efficient causes of events in themselves and that all events are caused directly by God. This would mean that while mind and body appear to interact, in fact it is God that is changing each separately and ceaselessly. While Occasionalism is dismissed (often ridiculed), there is a kind of logic here. If God acts as intermediary, as it were, between nonphysical and physical substances, then because God would have created both in the first place, this would make the apparent causal connection between nonphysical and physical substances not especially troublesome for God to bring about. This way of thinking—all these possible mechanisms for Interactive Dualism—reflects the depth of Dualism's problem.

15.9. Emergent dualism

Emergent dualism is the idea that while mind or consciousness is not fundamental in reality, it comes into existence "naturally" when a certain kind of complex arrangement of physical atoms come together, say, in biological neurons. The resultant new substance that emerges would be nonphysical, generated by some meta-psychophysical processes or laws, and it would become the first-person subject of the mind or consciousness. This freshly emergent nonphysical substance, to take the extremes, could be either entirely dependent on the brain for continued existence or take on independent ontological existence in some strong sense (though the latter, to me, would seem a rather odd way for reality to be).

For some philosophers, emergent dualism is a softer-sell "dualism-light," because souls would then be a normal part of the physical world, however extended, where these as-yet-unknown "natural" meta-psychophysical laws would determine their automatic manifestation from complex structures, especially from brains (perhaps only from brains). Dualism's "pairing problem"—how can nonphysical substances ("souls") have causal relations with physical substances (brains) with zero tolerance for failure?—would be reduced under emergent dualisms because (i) souls would seem in a way tethered in space (Zimmerman, 2005), and (ii) souls would have been generated by physical substances (brains) in the first place.

As a theist, Richard Swinburne holds the creationist position that God creates anew each new soul. But, if he came to believe that this position was mistaken, then, as a theist, he would hold the view that God had already built into atoms their propensity to produce souls (Swinburne, 2016).

Out-of-body and near-death experiences (OBEs and NDEs) are said to support emergent dualism, in that if one starts by assuming OBEs and NDEs to be actual disembodied conscious experiences (17.12), then emergent dualism is said to be a candidate to explain them. And once this nonphysical substance (soul) comes into existence, it is then logically possible for this "soul" to become independent of its progenerating physical substance (brain) and to maintain its existence beyond the dissolution of the physical (Kopel, 2023).

Finally, there would be no necessity that the kind of meta-psychophysical laws that generate emergent dualism should be restricted to complex arrangements of atoms in biological entities or contexts. Thus, under emergent dualism, AI consciousness would not be impossible, as it would be under traditional forms of dualism (AI Consciousness, 24).

15.10. Kind's dualism 2.0

Philosopher Amy Kind defends dualism 2.0, "a thoroughly modern version of dualism … decoupled from any religious or non-scientific connotations." Her argument is direct and forceful: "A physicalist framework cannot adequately capture the full reality of our conscious experience"—which has a "qualitative nature." However physicalism is defined, she says, "whether it's in terms of current physics or future physics, or some other way entirely—we should see the theory as committed to an important constraint: Physicalism can be true only if the phenomenality is not a primitive aspect of the world" (Kind and Stoljar, 2023, pp. 4, 58).

She analyzes and rejects Materialist Theories of Representationalism (9.8) and High-order Theories (9.8.3), and Russellian Monism (14.1), and she deflects the counterattack that "rejecting physicalism is tantamount to believing in ghosts, or fairy dust, or magic." She stresses that "the claim that consciousness is not a physical thing does not commit one to the existence of spooky stuff. Rather, it should be seen as perfectly consistent with an adoption of a broadly naturalistic conception of the world and our place in it." She calls Dualism 2.0 "a rebooted version of dualism … what it looks like to adopt this kind of view from the vantage point of the 21st century" (Kind and Stoljar, 2023, p. 5).

Kind's claim is a simple one: "Just as physical states, events, and processes are an irreducibly real part of the world, so too are phenomenal states, events, and processes an irreducibly real part of the world" (jointly, "activity"). Given "the existence of both phenomenal activity and physical activity, and further, in virtue of its claim that these two kinds of activity cannot be reduced to one another," she declares that "the view is appropriately characterized as dualistic." Immediately, however, she stresses that "this duality need not be thought of in terms of mental substances. We can have duality of activity without duality of entities" (Kind and Stoljar, 2023, p. 53).

While obviously distinct from physicalism, Kind's dualism 2.0 distinguishes itself from Russellian Monism (and Panpsychism, 13), because, although the "claim that phenomenality (or proto-phenomenality) can be found at the fundamental level of reality … is consistent with dualism 2.0 … it is not required by it." Dualism 2.0, she says, "need not take mass and charge to be the appropriate model for phenomenality." Nor does dualism 2.0 "commit itself to the ubiquity of phenomenality," nor "to anything spooky." Just because "something cannot be reduced to the physical" does not mean, ipso facto, "that it is magical or mystical." Her example is mathematics (Kind and Stoljar, 2023, pp. 53–54).

What about the physicalist argument that specifying the putative phenomenal laws seems a project from nowhere? Kind reminds her critics of their lack of progress "in giving precise physical or functional specifications of phenomenally conscious states"—and she concludes that "dualism 2.0 is not here in any worse shape than its competitors." She holds out hope for "a better and broader understanding of the nature of causation" that could enable us "to accommodate mental causes and thus affirm the causal efficacy of the phenomenal … without those seeming either mysterious or spooky" (Kind and Stoljar, 2023, pp. 55–56).

15.11. Soul in the Hebrew Bible and Jewish philosophy

If one wants to pay attention to the nature of consciousness or soul in the Hebrew scriptures (which is recognized as foundational by traditional Christianity and Islam as well as by Judaism), there are two essential words to consider: "*nephesh*" (נֶפֶשׁ), often translated as "soul," and "*ruach*" (רוח), often translated "spirit." Neither word is translated consistently, nor does either map cleanly unto modern meanings of soul or consciousness.

The essential verse for *nephesh* is Genesis 2:7: "God formed man from the dust of the ground, and breathed into his nostrils the breath of life," and "the man became a living being (or soul, *nephesh*)." If *nephesh* is translated "soul," that "soul" was not immortal (in that it had to be described as "living"); it was not a nonphysical substance *given* to the man, but rather it was what the man *became*. *Nephesh* applies to all sentient creatures, not just to humans, and although mostly translated "soul", it is elsewhere translated as life, person, creature, mind, heart (emotions), desires. There are several places where the context seems to require that nephesh be translated "dead"—it would be an odd coupling, indeed, for *nephesh* to be an immortal soul and at the same time be dead.

The first use of *ruach* in the Hebrew bible is Genesis 1:2, where it is the "spirit" (*ruach*) of God that is hovering in the darkness over the surface of the waters of a formless and desolately empty earth. But *ruach* is elsewhere translated "wind" (many verses), as well as vigor, courage, anger, disposition, patience, desire, even mind as the seat of mental acts or moral courage. Ruach is used in "holy spirit" as well as in God's spirit. While neither *nephesh* nor *ruach* means soul or consciousness, *ruach* seems closer to a mental designator and *nephesh* closer to a living body designator.

Philosopher and rabbi Aaron Segal offers a defense of a traditional Judaic view that there are souls and that they exist long before being embodied. Responding to the materialist challenge that it's very surprising that none of us remembers anything from before we were born, he proposes that each of us has "been *in existence* for a very long time" but "only came to be a thinking thing at a certain point in the development of her body (or brain)." Other respectable metaphysical views, he argues, "have us existing for just as long and undergoing transformations no less radical than this. For example, according to one prominent view, anything that ever exists, always existed and always will exist. Nothing really goes into or out of existence. What looks like going into and out of existence is just a matter of going from being abstract (with no causal powers and no location, like a feature) to being concrete (with causal powers and a particular location, like a person), and back again. An immaterialist who goes this route need not maintain that any of us has undergone a transformation so radical as from the abstract to the concrete: just from unthinking to thinking" (Olson and Segal, 2023; Segal, 2023).

Segal then moves to a view he calls "closer to home": animalism—a prominent version of materialism that each of us is a human organism. "Quite plausibly," he says, "animalism has as a consequence that each of us was once an unthinking fetus. So, according to that prominent version of materialism, each of us has undergone a transformation from an unthinking thing to a thinking thing."

Physicist/businessman Eduard Shyfrin, who has developed a "Kabbalah of Information" framework that integrates information theory with the Jewish mystical tradition, calls the Kabbalah soul "the information entity with the dimension of self that is structurally part of the informational foundations of the worlds (The Tree of Sefirot)" (Shyfrin, n.d.).

The Kabbalah of Information, Shyfrin says, holds that God created only information, nothing else, as the building blocks of all reality. Thus, there is no fundamental difference between material and spiritual. Creation is an information space ("infospace"), composed of concepts of different complexity and dimensionality. The distance between concepts in infospace is measured by the likeness of their meaning, generating a form of hierarchy of concepts or "worlds"—as determined by the Kabbalah Law of Likeness. Moreover, all the worlds are structurally invariant; the Tree of Sefirot has a fractal structure. The transfer from one concept to another is incremental; it takes place when information change reaches an "error threshold" (Shyfrin, 2019).

Based on the above, Shyfrin explains that the "soul" is the information structure similar to the structure of the "worlds" (Tree of Sefirot), with the additional dimension of "self." This structural similarity allows for the smooth interaction between the soul and the Tree of Sefirot. Souls can "move" in infospace, which, for example, is the process of learning and thinking. All souls intrinsically have the same kinds of concepts in general, but in particular, souls are distinguished by their taking concepts from different parts of the hierarchy of concepts. This process determines the "DNA" of the soul and all its potential functions (i.e., intellect, memory, etc.) (Shyfrin, 2019).

In addition, according to Shyfrin, because "according to the Torah the soul is in the blood" (hence the Judaic prohibition against eating blood), "the information content of part of the soul's hierarchy may be structurally similar to that of DNA." Perhaps, at the moment of the soul's creation, "G-D chooses its complexity and dimensionality, which have hierarchies of structure and which entail the soul's intellectual potential."[50]

15.12. Soul in the New Testament and Christian philosophy

Almost all Christian denominations feature an immortal soul as essential doctrine and it is conventional wisdom that the immortal soul is supported by passages in the New Testament. Yet there are opposing views; for example, Peter van Inwagen's "Christian materialism" (10.3)

[50] According to Shyfrin, the Kabbalah Law of Correspondence states that every concept has a multitude of corresponding concepts in all parts of information space, which has a fractal, hierarchical structure that generates differences in complexity and dimensionality.

(Van Inwagen, 1995).

Biblical scholar James Tabor points out that although many assume that the New Testament abandons the Hebrew view of the "soul" (*nephesh)* as simply a "living being," referring in Genesis 1 to all breathing creatures, such is not the case. The Greek term usually translated "soul" (*ψυχή psykhḗ/psychi*) essentially means "life," and thus refers to a living "breathing" being; so that rather than *having* souls, humans *are* souls. The central concept is that of breathing or not breathing—which equates to being alive or dead. Thus "soul" is most often used for the "self," which is the "whole" being and it can be destroyed along with the body (Matthew 10:28). Thus, we read of "fear coming upon every soul" meaning every individual (Acts 2:23) or Jacob's children numbering "seventy-five souls"—or persons (Acts 7:14). The Apostle Paul metaphorically speaks of the dead as "asleep"—no longer conscious or breathing, so that resurrection is an "awakening" in a new transformed body. Without the resurrection they would "perish" (1 Corinthians 15:18). Likewise, giving up the "spirit" (*pneuma*) is to breathe one's last breath and die (John 19:30) (Tabor, 1989; Tabor, 2023b; TaborBlog).

"But, of course, what I assert here can be contested," Tabor adds, especially by Christian apologists and theologians who consider the subsequent idea of the immortal soul fundamental to Christianity. However, he says, there are very few texts in the New Testament that picture the "afterlife" in the lower Hadean world as "conscious" or semi-conscious, or in a state more actively aware than Paul's metaphor of "sleep," which is grounded solidly in the Hebrew Bible (Tabor, 2023a).

Historian of ancient religions Jonathan Z. Smith emphasizes the shifting nature of perceptions taking place in the late Hellenistic/Early Roman period (200 BCE to 200 CE), when forms of Christianity and Judaism that became dominant were emerging (Smith, *Encyclopedia Britannica*). The shift is from the archaic, which Smith calls the "Locative" view of the cosmos—in which human beings had their place: death was death, and life was life—to what he calls the "Utopian"—a perfect heavenly world beyond this one in which we really "belong" or to which we "return" (Tabor, 2022).

Still, by and large, the New Testament is strikingly "Hebraic" in its views of body, soul, and spirit as constituting the whole person, and death or the grave as a place of no return—except that the idea of resurrection provided future hope of "making the dead live," which is the standard Hebrew expression to this day (Tabor and Wise, 1995).

Christian philosopher Andrew Ter Ern Loke surveys, from a Christian perspective, how human beings are generated (after Adam and Eve). In the early church there were three competing views: Traducianism, Creationism and Pre-existence, all of which assume substance dualism. According to Traducianism, God uses parents to create the souls of children; according to Creationism, the souls of children are directly created by God (either at or soon after biological conception). Pre-existence is the doctrine that God has a "stock of souls from eternity and allocates them as needed" (Loke, 2022).

Pre-existence is widely regarded as unorthodox, while theologians have been divided on Traducianism and Creationism, with Augustine acknowledging that he does not know which position is the correct one. Creationism has been the dominant though informal position in Reformed Theology and the Catholic Church since the time of Peter Lombard (*c.* 1100–1160), while Traducianism has been the dominant position in Lutheran theology[51] (Loke, 2022).

Loke proposes a possible way in which Traducianism and Creationism may be combined, utilizing a modified hylomorphic theory of human souls such that, "while the soulish potentialities are passed down from parents to children in accordance with Traducianism, the particular restrictions on the form of soul-stuffs are created by God so as to bring into existence particular individuals."[52] Separately, Christian substance dualism is said to be consistent with Darwinian evolution (Loke, 2022).

Souls, of course, remain core Christian doctrine, and they are defended as "a better explanation for consciousness." Dualism is said to imply theism and that dualism and theism are "ontologically tied together." Joshua Farris "advances a case for the person or self as being the fundamental bearer of conscious properties … where the primary bearer, binder, and ground of consciousness is the soul as an immaterial substance" (Farris, 2023, 2024).

15.13. Soul in Islamic philosophy

In Islam, the nature of the soul is a central concern, and is not dissimilar to the soul in Christianity and Judaism (understandable because the three developed side by side during the Middle Ages, rather harmoniously, too). Building on ancient and Neo-Platonist philosophers, medieval Islamic philosophers, mainly al-Kindî, al-Farabi, Avicenna, and Averroes, developed an Islamic metaphysic of the soul by evaluating the concepts of intellect, soul, *nafs* and body. Especially important is *nafs*, which literally means "self," but can be translated "*psyche*" and "soul." In building an Islamic theory of consciousness, the relationship between the soul and body is shaped by the unification of the soul with the body, the soul's effect on the body, the soul's independence, the state of the body, the separation of the soul after the body's death, and whether the soul preserves its individuality (Islamic Soul-Body, 2020).

Avicenna has the soul in an accidental relation to a particular body, given that body's need for a central organizing and sustaining principle. "The soul itself is generated by the separate intelligences of the heavens and emanated by them upon the body" (Ivry, 2012).

Averroes focuses on the hierarchical structure of the soul, with each faculty sustained by a lower, more material, or less "spiritual," faculty. Thus, the nutritive faculty is substrate for the sensory faculty, which is substrate for the common-sense faculty, which is substrate for the imaginative faculty, which is, finally, the substrate for the rational faculty. While consciousness per se is not a direct concern, it would be enriched at each level (Ivry, 2012).

The Islamic scholar, teacher and classicist Hamza Yusuf describes the Islamic understanding of consciousness as "a spiritual light that God has placed into the human being." It's not metaphor, he says, "It's a light, a spiritual light." Noting that the term "consciousness" is relatively new and that "the pre-moderns would have had a very different view of things," Yusuf explains that in a person's relationship with God, "the mirror of the soul has to be polished because the light cannot shine properly unless there is a polishing. Remembrance of God is how one polishes the soul." He adds, "the human soul is considered 'aeviternal;' it has a beginning but no end" (Yusuf, 2023).

Contemporary Islamic philosopher Seyyed Hossein Nasr presents a full flowering of the soul in the afterlife, similar to the *Tibetan Book of the Dead* or Hindu doctrines of the afterlife. In some sense, he says, development does not stop with death. "Something stops," he says, "but the soul continues to develop" (Nasr, 2007).

[51] For other Christian philosophers, see Baker (2005).

[52] According to Loke, this proposal provides a metaphysical explanation for the counterfactuals of human freedom that are required by so-called "middle knowledge," which seeks to reconcile divine predestination and human free will, whereby God via God's perfect knowledge knew prior to Creation what every free creature *would* freely do if instantiated in any and all circumstances. Loke says his commitment to substance dualism does not depend on which model is correct, not even his own.

According to Nasr, Islam identifies paradise with a garden, which includes sexuality as well as eating—these raise, not lower, the value of paradise, he says. "All of these are to cut the soul loose from attraction to the lower reflections of these realities and have the soul gaze upon the real reality itself. That's what paradise is. And even within paradise, there are levels. The highest paradise is called the paradise of the essence, in which every single concept and idea and limited form of existence is transcended beyond the paradisal estate in the ordinary sense."

The state of the soul, Nasr says, is "meta cosmic," a kind of merging without destruction of the individual. "It's what Meister Eckhart called 'fusion without confusion'—a beautiful expression. It's like swimming in the ocean of divinity. To transcend that into divine unity is what you might call a bi-unity. By some great mystery, we are given the power to be conscious of our own nothingness in divinity" (Nasr, 2007).

15.14. God as the supplier of souls

Many in the Abrahamic religious traditions—Judaism, Christianity, Islam—believe that God dispenses souls actively to each individual (whether at birth, conception or some arbitrary time is irrelevant here). Whether all these original souls are the same kind of tabula rasa, indistinguishable initially one from another, or whether each soul has its own particular properties or propensities, is a matter of debate.

Aaron Segal addresses another anti-dualist challenge—i.e., dualism would require material things like our bodies to have the extraordinary power to generate souls ex nihilo—by invoking the God who created them. "If God exists," he argues, "then God might well be creating those souls in accordance with the laws; otherwise, this process would happen by itself. Either way, I'm not sure how much more extravagance any of this adds to the fact that souls are coming into existence *ex nihilo* in the first place. God is already supposed to be able to create *ex nihilo*, so if God is creating the souls, this would add no more extravagance at all. If God isn't involved, there would be no agent at all creating the souls—the body would be no more of an agent than the sun is in growing trees" (Olson and Segal, 2023; Segal, 2023).

A few religious denominations, especially in the Christian tradition, go further and assert that not only does God dispense a soul to each individual, but also God makes a determination, prior to or at that moment of allocation, what the future holds for that individual soul-person: the soul-person's ultimate destiny, whether that soul-person will attain salvation or be condemned to damnation. This controversial doctrine is called "predestination," and most mainstream religions reject it (Predestination, 2024).

15.15. Personal and cosmic consciousness in Indian philosophy

Theories of consciousness that developed in the ancient Indian subcontinent, based on the Vedic scriptures, focus on the relationship between individual human consciousness and cosmic consciousness. Roughly, there were two major views: each individual human consciousness is a "piece," as it were, of the cosmic consciousness, or each individual human consciousness, in some mystical sense, is the entirety of the cosmic consciousness, even though there are innumerable instantiations of the same thing (Sarvapriyananda, 2023b; Sarvapriyananda, 2023a; Medhananda, 2023).

These centers of individual consciousness would reincarnate through countless cycles of birth, death, and rebirth before a final disposition would be made, with the individual consciousness being absorbed back into the cosmic consciousness, as if a single drop of rain, having evaporated from the ocean, condenses back into it.

While the main Advaita Vedanta tradition is nondualist, meaning that consciousness is the only fundamental existent and all else, including the entire physical world, is derived from consciousness, there are minority schools that maintain that the physical world has realist existence (Medhananda, 2022, 2023).

Historically, and perhaps ironically, one of the oldest Indian philosophical schools, Samkhya, advocated the fundamental existence of two distinct, universal realities: *prakriti* is matter or nature (time, space, energy), and *purusha* is consciousness or spirit. While the entirety of our perceived universe is nature (*prakriti*), including our bodies and brains, even our minds and emotions, that which experiences the external world and the internal world of the mind is consciousness or the self (*purusha*). Hence, dualism (Sarvapriyananda, 2020). Swami Sarvapriyananda explains: "The Samkhyans were strict dualists. They said there is no larger consciousness. Each of us is an individual consciousness" (Sarvapriyananda, 2023b).

According to Swami Medhananda, Samkhya is indeed dualist. It is founded on the eternal *purusha* (spirit or self), which alone is sentient; it is the witness-consciousness; it is absolute, independent, free, beyond perception, above any experience by mind or senses, and impossible to describe in words. Everything else (including the mind) is only a modification of insentient *prakriti* (primordial nature); it is inactive, unconscious, and is a balance of the three *gunas* (qualities or innate tendencies) (Medhananda, 2022; Samkhya, 2024).

As Swami Vivekananda explains, the English word "mind" corresponds to what Samkhya philosophers call the *antaḥkaraṇa* (internal organ), which comprises four aspects: the cogitating or thinking faculty; the will (or the intellect); the self-conscious egotism; and the substance in and through which all the faculties act, the floor of the mind as it were. Swami Vivekananda describes the Samkhyan approach to consciousness: "Mind, intelligence, will, and everything else is insentient. But they are all reflecting the sentiency, the *cit* [consciousness] of some being who is beyond all this, whom the Samkhya philosophers call *puruṣha*." Thus, Samkhya has a metaphysical dualism between conscious spirit and insentient matter. Fundamentally, even the mind (*antaḥkaraṇa*) is actually a subtle form of insentient matter, but it *appears* to be conscious because of the "light" of the *puruṣha* behind it (Medhananda, 2022). In other words, the body/brain is "a gross form of matter" and the mind is "a subtle form of matter"—and the soul is necessary to "illuminate the mind with consciousness" (Medhananda, 2023).

Souls have always existed; souls are not created by God or by anything else; souls are part of the divine consciousness. How then do we each have our own unique conscious perspective? Swami Medhananda's mechanism is that "the one divine consciousness playfully limits itself" in the form of each person's private consciousnesss (Medhananda, 2023).

To enrich contemporary debate about consciousness, Swami Medhananda calls for considering the relevance and epistemic credentials of meditative techniques and spiritual experience. Doing such, he says, would bring philosophy of mind into fruitful dialogue with philosophy of religion (Medhananda, 2022).

Indian philosopher and yogi (and nationalist) Sri Aurobindo envisions an ongoing, progressing evolution of consciousness as a prime feature of world meaning and human purpose. "He holds that the human mind is much too imperfect a type of consciousness to be the final resting point of nature, and that just as life developed out of matter, and mind out of life, a still higher form of consciousness is bound to develop out of the mind" (Cornelissen, 2004).

Sri Aurobindo bases the ontology of his evolutionary consciousness on the Vedāntic view of consciousness, which, in one telling, says that "consciousness is pervasive throughout reality and that it manifests as a range of ever-higher gradations of consciousness and being." In each category of reality, consciousness has its tailored form. "In matter, consciousness is fully engrossed in its own existence and shows itself only as matter's habit of form and its tendency to obey fixed laws. In plant and animal life, consciousness begins to emancipate a little, there are the first signs of exchange, of giving and taking, of feelings, drives and emotions. In the human mind we see a further emancipation of consciousness in the first appearance of an ability to 'play with ideas in one's mind' and to rise above the immediate situation." The mind, however, constitutes opposing characteristics. On the one hand, it is "the plane of objective, generalized statements, ideas, thoughts, intelligence,

etc." On the other hand, it "is also an inveterate divider, making distinctions between subject and object, I and thou, things and other things" (Cornelissen, 2004).

From the Vedic perspective, "ordinary human mentality is considered to be only the most primitive form of mental consciousness, most ego-bound, most dependent on the physical senses. Above it there is the unitary Higher Mind of self-revealed wisdom, the Illumined Mind where truths are seen rather than thought, the plane of the Intuitive Mind where truth is inevitable and perfect, and finally the cosmic Overmind, the mind of the Gods, comprehensive, all-encompassing." But one must rise beyond all of them to find ultimate perfection, "one with the divine consciousness that upholds the universe" (Cornelissen, 2004).

While various spiritual traditions have set life's highest goal as connecting or even merging with the absolute consciousness, Sri Aurobindo distinguishes his vision by announcing, "It is at this moment for the first time becoming possible to let a supramental consciousness enter into one's being and transform it in every respect." It is this "comprehensive, supramental transformation of all aspects of human nature" that is the central theme of Sri Aurobindo's work—and it is his grand prediction that human progress via the evolution of consciousness will eventually bring about "supramental consciousness as much an intrinsic, 'natural' part of earthly life as our ordinary mentality is now" (Cornelissen, 2004).

According to Ravi Gomatam, a quantum physicist and a monk of the *Gaudiya Vaishnava* (GV) *Vedanta* school of India, GV Vedanta is monotheistic, with a pluralist ontology that distinguishes between the energetic personal God (*shaktiman*) and the diverse energies (*shaktis*) such as consciousness and matter, which emanate from God. Both the energetic personal God (the Universal "I") and his diverse energies, which include consciousness and matter, are ontologically real. While the material atoms lack consciousness and therefore are indistinguishable, the plane of non-material consciousness comprises innumerable individual units of consciousness, each with its own unique "I" (Gomatam, 2021).

Yet, Gomatam says, GV Vedanta is uniquely compatible with the materialistic perspective informing modern cognitive science—namely that thinking, feeling, willing, intelligence, and even our present sense of "I" spring entirely from matter. This is via the GV Vedanta idea that many properties of consciousness can be separated from consciousness and instantiated in appropriate complementary "levels of matter," a novel technical concept that Gomatam is introducing through his work in the foundations of quantum mechanics. He says it is different from the prevailing idea of hierarchy of matter at various scales in physics.

The color, size and shape of an apple can be instantiated on paper. A plastic apple may instantiate even further properties of the apple, such as its 3-dimensional shape, weight and texture. In either case, the apple itself is not reduced to the painting or the plastic object that instantiates its properties. Similarly, Gomatam explains, GV Vedanta allows various traits of consciousness to be instantiated sans consciousness in matter at various "levels" of matter, which are mutually exclusive, causal realms that complement one another, with each higher level not being constituted by its lower levels (Gomatam, 1987).

Even though matter instantiates properties such as thinking, feeling, experience and even an "I" via an apparent self onto these levels of matter, matter itself is not aware it carries these cognitive and affective properties. Only consciousness can know matter has these properties.

GV Vedanta further explains that we mistake these materially instantiated traits to be part of our intrinsic consciousness due to *maya* (illusion), imposed upon the individual souls in the material world by the Universal Person (*purushottama*), from whom all individual "I"s emanate, but who is different from them. In this way, Gomatam suggests that GV Vedanta can contribute novel, sophisticated notions of levels of matter to instantiate various features of consciousness, without reducing consciousness itself to matter. Gomatam points out that here GV Vedanta differs from Advaita Vedanta, which holds both matter and individual "I"s to be ultimately non-existent, and admits only an impersonal Universal "I". Jainism and Buddhism, two other schools of Indian thought, additionally treat the Universal "I," personal or impersonal, to be also non-existent (Gomatam, 2021).

15.16. Soul in indigenous religions

The concept of the soul, in multifarious forms, has infused indigenous and folk religions throughout the world, and although we tend to categorize these ancient belief systems as "pre-modern" and "pre-scientific," lacking the sophistication of the major Eastern and Abrahamic traditions, we may be remiss not to recognize the data and to assess its implications (if any). The geographic ubiquity of soul belief, spanning the globe and including all racial and cultural groups, and its resiliency over time, should not be ignored.

The cognitive science of religion, a relatively recent field of inquiry, can account for beliefs in supernatural agents and entities, from souls and ghosts to angels and gods (Barrett, 2000; Boyer, 2001; Lawson, 1993). Psychologist Justin Barrett's idea of a "hyperactive agent detection device" can explain why human beings evolved concepts of gods and spirits. (Barrett asserts that this evolved psychological mechanism is agnostic on whether such gods and spirits would actually exist: "Having a scientific explanation for mental phenomena does not mean we should stop believing in them," he says [Barrett, 2012].)

Although the soul in indigenous religions is often more a vital principle or an immanent power resident in all animate and even inanimate objects, not a non-physical substance in each individual, there is wide recognition of spiritual aspects of human beings. While it is not fruitful to try to discern the metaphysics of what is designated by some aborigines as "spirit of the man," or "spirit in the man," there is certainly widespread belief in the existence of forces, powers and entities beyond their physical worlds (Rivière, 1987, 2005).

Whether these beliefs can be classified as substance dualism as presently conceived is debatable, although numerous examples show that "there exists a quite noticeable distinction between the body element and the diversity of spiritual entities that one may call 'souls' for the sake of convenience, entities that may have the body as a prop." What James Frazer in *The Golden Bough* called the "external soul" has some characteristics of dualism's souls or spirits, such as the capacity to depart the body during dreams. (Differences include, for example, the external soul living in an animal double or in one's shadow.)

The origin of the indigenous soul, compared with that of dualism's soul, also has similarities (e.g., coming from an almighty spirit) and differences (e.g., obtained as a gift or by conquest or by choice). The Ewe of Togo use specific, separate terms for the "substance of the soul" and the "breath of life," and believe that the individual, before incarnation, exists as a spirit, and together with the supreme creator (Mawu-Lisa) he or she chooses their own destiny. Other indigenous groups have very physical means to obtain souls, such as pilgrimage, fasting, eating, combat and killing (Rivière, 1987, 2005).

Regarding its destiny after death, souls can reach new worlds in which to live or be transmitted as a vital force to descendants. The majority believe that after death their ancestors live in another world. Many African religions focus on ancestors, who, in some cases, can reincarnate in a newborn baby.

The Native American Dakota have four types of souls (given by the sky god): one is judged after death—if deserving, one's soul enters the world of spirits; if not, it must wander forever. Almost everywhere, the soul after death involves a gradual purification through a series of trials. The ultimate destination is a celestial space or an undifferentiated earth-based place (underground, marshes, desert). While living in the other world, the dead person can be present elsewhere; as a specter or a ghost (Rivière, 1987, 2005).

In Chinese folk religion, the majority of supernatural beings are thought to originate from the "souls" of dead people (Harrell, 1979). Traditional Chinese Medicine (TCM) is said to engage "a deeper level of consciousness that touches various organs of the human body." Every organ is in some sense involved in consciousness. This includes the

brain, of course, but it also includes the liver, the kidney, the heart, etc. each with its own essence or contribution, thus forming "an integrated consciousness system." "Shen" (神) is the TCM concept corresponding to "consciousness" and the classic TCM text (*Huangdi Neijing*) describes "how to understand the meaning of Shen in the heart, soul in the liver, meaning in the spleen, soul in the lungs, essence in the kidney, and will." According to TCM theory, "the human body is a little universe. Things outside the body form the big universe. These outside and inside universes are closely connected together in one holistic overall system." The claim is that this idea corresponds to the cognitive-science concepts of embodiment, specifically Ecological Psychology (9.6.7) and Embodied Cognition (9.6.1) (Lu et al., 2022).

The imaginative varieties of indigenous souls reflect the richness and abundance of human creativity. The Fang of Gabon name seven types of souls: three disappear at death; two persevere after death; one is a disincarnated spirit (which can appear as a ghost); and one is "both shadow and soul." (Harrell, 1979). While these "souls" are not dualist substances, they reflect aspects of dualism.

No claim is made that souls in indigenous religions, however ubiquitous, corroborate dualism as a theory of consciousness. On the other hand, the substantial and similar anthropological data should at least be acknowledged.

15.17. Realms of the soul

Many, I'd say most, religious traditions present elaborate levels or stages or realms of the soul, accommodating the soul and its elaborate journeys before birth and after death—Yogācāra Buddhism, Sufism in Islam, Kabbalah in Judaism, Christian mysticism, occult sects such as Theosophy (15.18). These religions espouse different doctrines superficially, but the complex, multi-level, multi-dimensional, geometric structures of the habitats of the soul—the bewildering imagery of what souls are, where they come from, where they go, what they do—look remarkably alike.

While such visions of the soul do not address directly the essence of consciousness, the fact that they espouse a nonphysical substance or entity, the soul, that is prominent, primitive, and permanent makes personal consciousness derivative and hence also nonphysical.

Yet, all this means little for purposes of this dualism category. In no way does any of this, in no way does *all* of this, add verisimilitude to the story of souls, but humanity's fascination, obsession, with souls cannot be denied.

15.18. Theosophy's eclectic soul and consciousness

Soul and consciousness are core doctrines of Theosophy, an occult amalgam of esoteric ideas from Western and Eastern religions, traditions and philosophies. Theosophy defines itself as "Wisdom-religion" or "Divine Wisdom," and considers itself "The substratum and basis of all the world-religions and philosophies, taught and practiced by a few elect ever since man became a thinking being" (Theosophy, 2023).

Theosophy's "soul" describes three of the seven principles that are said to compose human beings: *animal soul* (astral body, astral shape, and the animal or physical intelligence); *human soul* ("a compound in its highest form, of spiritual aspirations, volitions, and divine love; and in its lower aspect, of animal desires and terrestrial passions imparted to it by its associations with its vehicle, the seat of all these"); *spiritual soul* ("irrational in the sense that as a pure emanation of the Universal mind it can have no individual reason of its own on this plane of matter") (Soul, 2023).

The Secret Doctrine, Theosophy's primary text (written by its founder, Madame Blavatsky), speaks of consciousness as "the dark mystery of non-Being; unconscious, yet absolute Consciousness; unrealisable, yet the one self-existing reality." The state of consciousness is described as "beyond limitation, and hence is beyond the cognizer, cognition and cognized." It is the state attained in Nirvana, a state "in which all sense of individuality is merged in the whole" (Consciousness, Absolute, n.d.).

Theosophy approaches personal consciousness "as sentience or awareness of internal and external existence." In this view, Theosophy's consciousness "includes any kind of cognition, experience, feeling, or perception." A special case of consciousness is "self-consciousness" or "self-awareness," which is "the experience or perception of one's own personality or individuality." Theosophy's consciousness is "a fundamental (not an emergent) property of the cosmos, which is present in everything including inorganic matter." The implication of this universal ubiquity is that "consciousness is not necessarily a cognitive function as normally experienced by humans, but rather the more basic ability to perceive and respond to the environment in some form." Thus, Theosophy regards each individual atom as "possessing a principle of consciousness in its most basic form. This does not mean that there is some process of thinking in the atom." Rather, "'atomic consciousness' could be its ability to 'perceive' or 'identify' atoms with which it has affinity, responding to them by forming molecules" (Consciousness, 2023).

In Theosophy's telling, there are many levels of consciousness, "depending on the plane or body through which it manifests." In addition, the difference between consciousness and self-consciousness is also important, "since the latter is said to be a special feature that is fully developed only in human beings, especially in connection to the physical plane" (Consciousness, 2023).

A contemporary Theosophy thinker is Edi Bilimoria, an engineer, classical musician and life-long student of perennial philosophy. He takes "Unfolding Consciousness" as his overarching framework "to show how the Universal Wisdom Tradition—the Perennial Philosophy—and the corroboration of some of its tenets by enlightened science of the quantum era, broadens and contextualises mainstream science beyond its existing metaphysical limitations." He explores, "in the manner of the Universal Wisdom Tradition, the unfolding of Consciousness from its Unmanifest and Implicate realms, through Cosmos, and Man." Mind and consciousness, he contends, cannot be wholly explained without in-depth understanding of "the subtle (i.e., non-physical) bodies of the human being on all levels" (Bilimoria, 2022; Bilimoria, n.d.).

15.19. Steiner's esoteric soul and consciousness

The esotericist, philosopher and spiritual teacher Rudolf Steiner had a complex and changing relationship with Theosophy, from apologist and thought leader to competitor and reprobate. He developed a large following in his time, which to some degree continues. His "spiritual science" sought to expand knowledge and wisdom (Steiner, 2024.)

Consciousness, particularly the evolution of consciousness, is central to Steiner's belief system and spiritual teachings. He explains "how it is possible to develop higher faculties of consciousness—Imagination, Inspiration, and Intuition"—and how humanity could "gradually take in hand its own destiny through the conscious and free development of spiritual capacities." He devoted much of his teaching to the esoterica of consciousness and soul, describing vividly "one's life after death and the progress of the individual through the planetary spheres where tasks and goals for future incarnations are prepared in cooperation with the spiritual beings of the Hierarchies" (Steiner, 1923a).

Steiner differentiates consciousness from "soul life," though they are obviously related. His consciousness is a "continuous stream of visualizations," while it is "not the same thing as the continuous stream of the soul life." Moreover, "a visualization can live on in the soul without entering consciousness." This relates to memories, which are usually not conscious and are held in our soul life, and "in order to be conscious of them [memories] we must first call them up out of the unconscious life of the soul by an act of will." Consciousness, Steiner says, "illuminates but a part of the soul life" (Steiner, 1909).

Steiner defines consciousness in (at least) two ways: (i) the overlapping in the present of the current (streams or flows) of emotions coming out of the future and the current of visualizations flowing out of the past; and (ii) the meeting of the astral and etheric bodies (Steiner,

1909, 1923b). What does this mean?

Steiner states that "the riddles of consciousness will be solved and the whole peculiar nature of the soul life clarified if you start with the premise that the current of desire, love and hate comes to meet you out of the future, and meets the current of visualizations flowing out of the past into the future. At every moment you are actually in the midst of this encounter of the two streams, and considering that the present moment of your soul life consists of such a meeting, you will readily understand that these two currents overlap in your soul. *This overlapping is consciousness*" (Steiner, 1909).

To get a sense of how such overlapping happens, one begins with Steiner's description of the human being as having seven distinct members, the first three of which are "bodies"—physical, etheric, astral—and the fourth is Ego or I. The *physical body* covers the workings of physics and chemistry. The *etheric* body or "life body" describes forces or energy fields that are spatial and take the form of our physical body. The *astral body* expresses affect, feelings and emotions, and has "movements," such as expansion and contraction (reflecting positive and negative emotions, respectively).

To Steiner, how these bodies articulate is critical. For example, "throughout the whole of an earthly life the physical body and the etheric remain together, never separating even when, in sleep, the etheric body and the astral body have to part company." Similarly, the Ego and the astral body never "part from one another during life on Earth. In our waking state we give life to our senses through our Ego, and through the astral body to our nervous system" (Steiner, 1923b).

Two critical elements are: (i) "clairvoyant consciousness about the etheric and astral bodies," and (ii) "the intersection of the two streams … the two currents meet in the physical body." In this way, Steiner harmonizes his two definitions of consciousness—overlapping streams of emotions from the future and of visualizations from the past, and the meeting of the astral and etheric bodies, the two streams intersecting in the physical body.

What happens "when a man passes through the gate of death," as Steiner puts it? To simplify, "The etheric body detaches itself from the physical body—something that never happens during earthly life. And now, when the etheric body is free of the physical, all that has been interwoven into the etheric body is gradually dispersed … the experiences that have gradually penetrated into the etheric body … pass out into the universal cosmic ether, and dissolve." Steiner offers an intricate tapestry of the worlds beyond death: spiritual beings, a speaking universe, uniting with the whole Cosmos, the music of the spheres, rebirths, and more (I spare the reader the details) (Steiner, 1923b).

15.20. Nonphysical component in the human mind

This theory of consciousness is a generalized notion that in order to make the human mind, some kind of "nonphysical component," working with the human brain, might be needed. It is the speculative position I took in my first paper, published in 1969, where I emphasized that such a hypothetical nonphysical component would not be a traditional immortal soul (Kuhn, 1969).

I did not impute to this nonphysical component, on its own, consciousness or any kind of awareness, only its (potential) power, when working with the human brain, to transform the human brain into the human mind. I can almost find, if I stretch, parallels or resonance with Polkinghorne's "information-bearing pattern." (14.5) and Van Inwagen's "naked kernel" (10.3).

Here I distinguish human mind from consciousness, which we presume to exist in many animals. Few doubt that mammals such as primates, dogs, and cetaceans are conscious and have mental experiences. Human mind and consciousness are like intersecting, non-overlapping Venn diagrams: some but not all of human mind is consciousness, and some (but not all) of consciousness is human mind; stated in reverse, aspects of human mind go beyond consciousness and instances of consciousness go beyond human mind.

My 1969 conjecture was that a "nonphysical component" might be needed to explain the vast difference between the mental outputs of humans and other mammals, especially those whose brains are larger than human brains.

To pursue the speculation, if consciousness per se requires some kind of dualist theory, and if human mentality is step-function qualitatively superior to any animal mentality, it might follow that if a certain kind of nonphysical component is needed for human consciousness, then perhaps a different nonphysical component structure is needed for animal consciousness.

To crawl farther out on this shaky limb, such a nonphysical component difference between humans and animals could come about in two ways: (i) human and animal consciousness have different kinds of nonphysical components; or (ii) there is one kind of nonphysical component for pure consciousness, applicable to both humans and other animals equally, and another kind of nonphysical component that transforms basic animal consciousness into human consciousness. (Undaunted by nested speculations, I had a curious Bible story where this might apply.[53])

Suffice it to say that I wrote my "nonphysical component" paper more than 55 years prior to writing this paper, so I ask that my views (and my style) then should not color too darkly my views now. (Well, maybe just a bit of coloring is fair …)

16. Idealisms

Idealism is consciousness as ultimate reality, the fullness of the deepest level of all existence, the singular fundamental existent. It is the theory of consciousness that takes consciousness to its maximum meaning. The focus here is ontological idealism, where ultimate reality is mind or awareness or thought, while everything else, including all physical worlds and universes and all that they contain, are derivative or illusionary. (I do not consider epistemological idealism, where all we can know is constrained by the structure of human thought.) (Guyer and Horstmann, 2023).

Consciousness as ultimate reality is the age-old claim, rooted in some wisdom traditions, that the only reality that's "really real" is consciousness—everything else, from physical laws to physical brains, is the generative product of an all-pervading and all-encompassing "cosmic consciousness." Each individual instance of consciousness—human, animal, artificial or otherwise—is a subset of this cosmic consciousness, the ultimate superset.

Idealism has a rich intellectual history, especially in the 18th century (e.g., Berkeley, Kant) and 19th century (e.g., Hegel, Bradley); it was anticipated by elements of 17th century philosophy and continued to develop into the 20th century (Guyer and Horstmann, 2023). Though often eliciting "the incredulous stare" (in David Lewis's delightful phrase), Idealism is taken seriously by philosophers. Moreover, it is the foundation of major religious traditions, especially among those that arose in ancient India.

To the surprise of some, Idealism as a theory of consciousness has not been fading in light of scientific advances. If anything, Idealism's

[53] At one point in my early ruminations, I wondered if there was anything in the Bible that might reflect the essence of human-level consciousness, distinguishing humans from other animals. In Daniel 4, an incredible account is given of King Nebuchadnezzar of Babylon, who was "driven from men and dwelt with the beasts of the field" for seven years: "Let his heart [mind] be changed from man's, and let a beast's heart [mind] be given unto him." (Dan. 4: 16). Then, after the seven years, "my understanding returned to me and I blessed the most High." (Dan. 4:34). Assume (for the moment) that this really happened, how could this have literally happened? Mental illness and its spontaneous remission would be a naturalistic explanation. I speculated something else: a change made to some "nonphysical substance" in Nebuchadnezzar's mind; conveniently, I had a "nonphysical component" at the ready.

explanatory star seems on the ascent, shining brighter, as consciousness maintains its mysteries and Idealism attracts more adherents.

David Chalmers muses, "One starts as a materialist, then one becomes a dualist, then a panpsychist, and one ends up as an idealist. I don't know where this comes from, but I think the idea was something like this. First, one is impressed by the successes of science, endorsing materialism about everything and so about the mind. Second, one is moved by problem of consciousness to see a gap between physics and consciousness, thereby endorsing dualism, where both matter and consciousness are fundamental. Third, one is moved by the inscrutability of matter to realize that science reveals at most the structure of matter and not its underlying nature, and to speculate that this nature may involve consciousness, thereby endorsing panpsychism. Fourth, one comes to think that there is little reason to believe in anything beyond consciousness and that the physical world is wholly constituted by consciousness, thereby endorsing idealism" (Chalmers, 2020d).

Chalmers defines idealism broadly "as the thesis that the universe is fundamentally mental, or perhaps that all concrete facts are grounded in mental facts. As such it is meant as a global metaphysical thesis analogous to physicalism, the thesis that the universe is fundamentally physical, or perhaps that all concrete facts are grounded in physical facts. The only difference is that 'physical' is replaced by 'mental.'"

Idealists are not necessarily committed to anti-realist views about the physical world, though some are, especially among Eastern traditions. It is perfectly coherent for an idealist to regard the physical world as "real" in the sense that it exists when no one is looking; "it just has a surprising nature," having been formed from mental fundamentals (Chalmers, 2020d).

Chalmers distinguishes three types of idealism. (i) "*Micro-idealism* is the thesis that concrete reality is wholly grounded in micro-level mentality: that is, in mentality associated with fundamental microscopic entities (such as quarks and photons)." (ii) "*Macro-idealism* is the thesis that concrete reality is wholly grounded in macro-level mentality: that is, in mentality associated with macroscopic (middle-sized) entities such as humans and perhaps non-human animals." (iii) "*Cosmic idealism* is the thesis that concrete reality is wholly grounded in cosmic mentality: that is, in mentality associated with the cosmos as a whole or with a single cosmic entity (such as the universe or a deity)" (Chalmers, 2020d).

Thus, micro-idealism has all fundamental forces and particles as entirely (not in part) mental; macro-idealism privileges what we commonly call mental as somehow constituting the foundations of reality; and cosmic idealism can be conceived as kinds of pantheism or theism, though not the dominant strands, of course. Moreover, there is resonance between these three kinds of idealism with three similar kinds of panpsychism, the rough difference being that whereas in panpsychism the mental, while everywhere, is not everything; in idealism, the mental is both everything and everywhere.

To Huston Smith, world religion expert and devotee, matter is not fundamental, but consciousness is. "Matter is like an iceberg protruding out of the sea of consciousness." Consciousness can never be destroyed, he said, but "can oscillate between different forms," which leads, he recognizes, to the issue of death. "We know what our consciousness is like; we can't explain it, but we can experience it. What will it be when we drop our body? Well, what we can say is if consciousness is the fundamental reality and it can't be destroyed, consciousness will continue. The light on the television screen will never go out. Now what the image on that screen will be after death, after we drop the body, we do not know. That's the ultimate mystery" (Smith, 2007).

To philosopher-theological scholar David Bentley Hart, "reason abhors a dualism, all phenomena should ideally be reducible to a single, simpler, more capacious model of reality. So, then, rather than banishing mind from our picture of nature, perhaps we should reconsider the ancient intuition that nature and mind are not alien to one another precisely because nature already possesses a rational structure analogous to thought" (Hart, 2022b).

Not sufficiently contrarian, Hart then considers "the ground of the possibility [that] regular physical causation is a deeper logical coinherence of rational relations underlying all reality." Perhaps, more to his point, "mind inhabits physical nature not as an anomaly, but as a revelation of the deepest essence of everything that exists."

16.1. Indian cosmic consciousness

Consciousness is central to the philosophical and religious traditions that emerged on the ancient Indian subcontinent, perhaps more central to Indian philosophy and religion than it is to any other global tradition. The sophistication and subtleties of the millennia-long discussions on consciousness in Indian traditions have enriched human understanding of, and appreciation for, consciousness as core of human sentience.

All the schools of ancient Indian philosophy were concerned with ideas about consciousness and self, which were based on the Upanishads, the late Vedic, sacred Sanskrit texts (800-300 BCE). Although the motivation was often the perennial question, "How does one [Self] overcome suffering?", the explorations developed sophisticated philosophies and subtle ontologies (Sarvapriyananda, 2020; Sarvapriyananda, 2023a).

Speaking on *Closer To Truth*, Swami Sarvapriyananda explains why ancient Indian thinkers of all varieties—Hindus, Buddhists, Jains, etc.—were so interested in consciousness. Their central quest was to overcome suffering, he reiterates, to attain liberation of the self. "Once you do that, you see immediately that consciousness and the self are very intimately connected. I am obviously conscious. I am aware. And it is in my awareness that I experience suffering, and the struggle to liberate myself from suffering. But all of it requires consciousness. Even the search for God requires consciousness" (Sarvapriyananda, 2023b).

Sarvapriyananda defines consciousness as "that to which everything else appears." So, this world, he asks, "Is it consciousness? No. Nothing in this world is consciousness because it's an object to you. Is this body consciousness? No. Because it's an object to you. Now, what about the mind, our thoughts and emotions, which would normally be taken as related to consciousness? By this elegant definition of consciousness as 'that to which everything else appears,' can you designate this thought or this emotion subjectively from your perspective? You can. And if you can, then even thoughts and emotions are also objects to consciousness. The result is that consciousness is clearly distinguished from all objects. Whatever appears to you belongs to material nature. And consciousness is not that. Consciousness does exactly one thing. It gives you a first-person experience" (Sarvapriyananda, 2023b). ("Consciousness" is the usual translation of the Vedantic term "*Chaitanya*," although alternative English words, such as "awareness" and "sentience," are also used.)

The preeminence of consciousness, both intrinsically and to the self, elicited a wide diversity of speculation about what consciousness is, and how it arises and functions. "Indian philosophy had different schools, and they argued with each other fiercely. Each of the schools fashioned its own approach to consciousness and to its relationship with self. The range of beliefs parallels consciousness studies today, from materialist-reductionism to idealism. Although the ancient Indian materialists (Charvakas) were a popular school, the dominant theme of the primary Vedanta schools, especially Advaita Vedanta, became nondual idealism, 'nondualism'" (Sarvapriyananda, 2020). Other schools said there are two kinds of consciousness: a personal consciousness associated with individual bodies and minds, and a cosmic consciousness associated with all bodies and minds. "You are the consciousness associated with your body and mind. And God is the consciousness associated with all bodies and minds. God is cosmic consciousness" (Sarvapriyananda, 2023b).

"But this goes further," Swami Sarvapriyananda says. "How does consciousness interact with material nature? There were multiple answers from multiple schools. One is that material nature is real, and consciousness is just an expression of material nature. (There were modern materialists in ancient India!) The second school says that the universe is produced from consciousness. And who says that? Every

theistic school in the world says that. If God is the creator God, and God is obviously conscious, then in some sense, consciousness produces the material universe. These are the dualists. The third school is the Samkhyan, where consciousness and matter are parallel; neither produces the other; both are fundamental, irreducible realities."

The fourth, Advaita Vedanta, Swami Sarvapriyananda's own school, is nondualist, "which means that you cannot solve the interaction problem. If consciousness and matter are fundamentally different, then there is no way they could interact. Where would be the place, the boundary, where interaction could occur?" So, not being able to solve the interaction problem, what to do? "Let's just stick to our experience," he advises. "What is matter? That which appears in consciousness. And if matter appears in consciousness, then matter can be reduced to consciousness. Thus, the materialist reduces consciousness to matter, the nondualist reduces matter to consciousness" (Sarvapriyananda, 2023b).

Advaita Vedanta, a monistic system, eradicates the dualistic dichotomy between consciousness and its object. Even more fundamental than the mind is nondual pure consciousness. The term for this ultimate consciousness is *Brahman*, "the vast" or "the limitless" (literally, "that which expands into everything"), and it is the key concept that unifies the consciousness of the individual with the consciousness of the cosmos, which is the fundamental, nondual reality of the universe. Rather than conceiving of *prakriti*/nature as a *transformation* of *purusa*/consciousness, in Advaita Vedanta, *prakriti* is considered an *appearance* of *purusa* (Sarvapriyananda, 2020).

In the succinct expression of the *Mandukya*, the briefest of the major Upanishads, "*Brahman* is all, and the Self is *Brahman*."

Thus, Advaita Vedanta's nondualism asserts that each individual soul, in some literal sense, is non-different from the infinite *Brahman*. "You are that underlying reality, *Brahman*. Not you as the body; not you as the mind; not even you as the person you think yourself to be, but as an underlying consciousness that shines through, functions through, and expresses itself through this body-mind complex." Swami Vivekananda, who introduced Vedanta to Western audiences, put it this way: "If only you knew yourselves as you truly are." Not as a body, bound to age, decay, and die; not even as a mind, a changing, limited personality, but as an unlimited consciousness expressing itself through a mind and a body (Sarvapriyananda, 2020).

The modern Hindu sage Bhagavan Sri Ramana Maharshi clarified the fundamental principles of Advaita Vedanta, as explained by philosopher/translator Michael James, an expert on Sri Ramana. With regard to consciousness, "Sri Ramana highlighted the distinction between transitive awareness (*suṭṭaṟivu* in Tamil) and intransitive awareness (*suṭṭaṯṟa aṟivu*). Transitive awareness is awareness that knows objects or phenomena, whereas intransitive awareness is awareness that knows nothing other than itself. In classical Advaita Vedanta, intransitive awareness is called pure consciousness (*śuddha caitanya*), because it is consciousness devoid of any content, and being-consciousness (*sat-cit*), not only because it is conscious only of its own being, 'I am', but also because it is the consciousness (*cit*) that is itself pure being (*sat*), meaning that it is what alone actually exists, so it is the one real substance (*vastu*) from which all other things derive their seeming existence, just as gold ornaments derive their existence from gold. Transitive awareness, on the other hand, is called *cidābhāsa*, meaning that it is an *ābhāsa* (semblance, likeness or reflection) of consciousness (*cit*), because it is not real consciousness, since it is consciousness of things that do not actually exist but merely seem to exist, like all the things seen in a dream. Only consciousness of what actually exists is real consciousness, and since what actually exists is only pure consciousness, it alone is real consciousness" (James, 2012, 2024).

However, according to James, "these are not two separate consciousnesses, but two forms of the one and only consciousness, one form of which is consciousness as it actually is, namely intransitive awareness, and the other form of which is an unreal appearance, namely transitive awareness. Intransitive awareness is real because it is permanent, unchanging, self-existent and self-shining. It is self-existent because it exists independent of all other things, and it is self-shining because it shines by its own light of consciousness, underived from anything else. Transitive awareness, on the other hand, is impermanent and constantly changing, and it is neither self-existent nor self-shining, because it derives its seeming existence from the real existence of intransitive awareness and it shines by the light of consciousness that it borrows from intransitive awareness. Intransitive awareness is therefore the reality that underlies and supports the illusory appearance of transitive awareness, just as a rope is the reality that underlies and supports the illusory appearance of a snake. That is, we cannot be aware of anything without being aware, but we can be aware without being aware of anything, so intransitive awareness is primary and fundamental whereas transitive awareness is secondary and emergent" (James, 2024).

Sri Ramana concluded that "transitive awareness (awareness of anything other than ourself) is an unreal appearance, and that the only real consciousness is pure intransitive awareness (awareness of nothing other than our own being). That is, consciousness or awareness is not an object but the reality of the subject, so no objective investigation can enable us to know consciousness as it actually is. Since we ourself are consciousness, in order to know ourself as we actually are, we need to turn our entire attention back on ourself, away from all other things"—a practice Sri Ramana called self-investigation (*ātma-vicāra*), which means "keeping our attention fixed firmly on what we actually are, namely our fundamental awareness 'I am', which is our very being, so he also called this practice 'awareness-investigation' (*jñāna-vicāra*)" (James, 2012, 2024).

According to artist and computer scientist Ganapathy Subramaniam, *Brahman* as "Consciousness/Awareness/Self" can be compacted to "I". While all things can be reduced to this "I," this "I" cannot be reduced (i.e., the Vedanta fundamental irreducible is in the first person). So, when Vedanta says, "I am that," meaning "I am the fundamental," it does not mean that the individual person is fundamental; rather the irreducible I is the fundamental. This leads to the declaration, "*Atman* is *Brahman*," meaning, "The Individual Consciousness is the same as Universal Consciousness" (which is the irreducible "I") (Subramaniam, 2023).

Subramaniam states that "reincarnation and the interrelated concept of karma are stepping stones to understand ultimate truth. Understanding ultimate truth is called Nirvana. It's nothing more nothing less." How do the multiple reincarnations "stop" with Nirvana? he asks rhetorically. "Nirvana means apprehending that the concept of births and deaths is an illusion and the consciousness that you truly are, does not get born or die. Consciousness is fundamental. and you are that. This is the only truth, and this obviously negates reincarnation—which is the true meaning of the statement that 'Once you achieve Nirvana, you no longer reincarnate.' It's simply a logical conclusion from the definition of Nirvana."

"Indian thought is layered and progressive, and as you move through the layers you need to abandon and evolve out of the previous one," Subramaniam says. "Within mainstream Indian thought you have Karma theory as well as negation of Karma theory. If you look at both at the same time, it appears to be a contradiction. But if you look at both as a progression, it fits in well."

Consciousness qua consciousness is "incapable of experiences," Subramaniam contends, "so, only a person (or any sentient) is capable of physical and mental experience. When you investigate who 'you' are, you will logically arrive at the conclusion that 'you' are not the person." But you will still be experiencing all the events of life, accumulating experiences, much like in a dream or a novel or a movie or a video game. But the fact is you are not the person. Nobody is ever the person they think they are or as they appear to be. And it all converges to the singular consciousness" (Subramaniam, 2023).

In that Advaita Vedanta's central teaching is "That Thou Art," with "That" representing God and "Thou" standing for the individual, how to counter the charge of blasphemy, equating oneself with God? The Advaita exculpatory answer is that when the limited personality is

transcended, the divinity within is revealed. Each soul is potentially divine. (Reasoning in reverse, the Advaita Vedanta system claims to prove the existence of God in that "our own existence *is* the existence of God"—although the reasoning, at least superficially, has a touch of circularity.)

Concisely, with respect to consciousness, the central paradigm of Advaita Vedanta is that there is only one nondual reality, which is consciousness, and it is this all-pervading cosmic consciousness that is our individual consciousness and generates our first-person inner experiences (qualia) (Sarvapriyananda, 2020).

Naturally, within Hinduism, different traditions understand the nature of consciousness in different ways, but most of them do take consciousness to be fundamental (Medhananda, 2023). One school follows the tradition of Sri Ramakrishna (a 19th century mystic in India), and his view was that while consciousness is fundamental, the one divine consciousness is not just impersonal but also personal, and that everything in the universe in reality is one and the same Divine Consciousness, even though everything in the universe in appearance, manifests as various and diverse forms. (This might compare to the Western metaphysics of panentheistic cosmopsychism, according to which the sole reality is one cosmic consciousness, which grounds all of the individual-level consciousnesses.) (Medhananda, 2022).

Aphorisms give flavor.

> The soul/consciousness is smaller than the smallest, larger than the largest, and is everything everywhere all at once.
> Consciousness localized is Body; globalized is Mind; universalized is Soul; and synchronized is Life.

To understand properly Advaita Vedanta's conception of consciousness, one must introduce reincarnation, the guiding belief in most India-based religious traditions that the soul goes through innumerable, perhaps endless, cycles of birth-death-rebirth. Without discussing reincarnation as a doctrine, with its (to be expected) myriad nuances, suffice it to say that reincarnation works to distinguish among soul, self and consciousness. While the underlying soul may be in a sense immortal, its consciousness is contingent on its current incarnation, with scant, if any, awareness of its prior existences (although the karma of past lives would influence the condition of future lives).

Relating consciousness to ultimate reality, Swami Sarvapriyananda explains what it means that "*Brahman*, the ultimate reality, is limitless existence, limitless consciousness, existence and consciousness *without limit*." Without limit, he says, "should be understood technically as no limits in space and no limits in time, and no limits in something called 'object limitation.' Limit in space means it's here and it's not there. But *Brahman* is not something that's located in one place. It's everywhere. And limit in time means it does not exist earlier, it does not exist later. But *Brahman* is not something that appears and disappears. It always is. Object limitation is interesting. A table is not a chair. A horse is not a cow. But *Brahman* does not have object limitation. Consciousness does not have object limitation. There is no object which is other than consciousness because they are all appearances of consciousness, in consciousness, and ultimately, nothing but consciousness itself" (Sarvapriyananda, 2023b).

16.2. Buddhism's empty, illusory phenomenal consciousness

Consciousness in Buddhism is sufficiently distinct, with its concepts of emptiness and illusion, it could command a prime category of its own on the Landscape, yet it also fits decently in idealism, appropriately after Hinduism. Buddhism also arose in ancient India and the legendary philosophical disputes between Hindu and Buddhist sages enriched both.

Buddhist discussions of consciousness feel radically different from contemporary Western discussions, as philosopher Jay Garfield explains, yet "can be valuable sources of viable alternatives, both with respect to positions on the topic and, more fundamentally, with respect to how questions and debates are framed in the first place" (Garfield, 2015, pp. 135–136).

Buddhism describes nine kinds or levels of consciousness. The first five reflect the five senses: eye consciousness, ear consciousness, nose consciousness, tongue consciousness, and body consciousness. The sixth is mind consciousness, which integrates the five senses and provides meaning. The seventh consciousness is directed inward, toward one's private thoughts and apprehends spiritual issues; it also creates the concept of self (from which all the deception is said to come because there is no entity 'self'). The eighth consciousness is known as "storehouse consciousness" where all our experiences, actions and deeds, are in some sense "stored," accumulating a lifetime of karma. (The eighth consciousness persists after death, unlike the first seven that cease when the body dies.) The ninth and highest consciousness, known as the Buddha nature, is the purest, forming the foundations for one's life and serving as the core of our energy and the source for all mental and spiritual activity. It cannot be affected by any of the karmic energy from the previous eight levels and attaining the ninth is to find peace and ultimate fulfillment" (Yifa, 2023; The Nine Consciousness, 2022).

Garfield analyzes these nine levels of consciousness by kind. These include: "sensory and conceptual forms of consciousness; consciousness that is introspectible and consciousness that is too deep for introspection; consciousness that takes external phenomena as objects and consciousness that takes inner phenomena as objects; consciousness that is merely receptive and consciousness that is constructive and even projective. In general, the complex set of phenomena is opaque to casual introspection, and are knowable only theoretically or perhaps by highly trained meditators." Garfield draws parallels between the nine levels and modern theories of consciousness: reflexive models of self-consciousness and self-knowledge, higher-order thought models, higher-order perception models and self-luminosity models (Garfield, 2015).

Regarding the Buddhist approach to phenomenal consciousness, the story is complex. On the one hand, as Garfield puts it, "There is no phenomenal consciousness; there is nothing 'that it is like' to be me. To believe in phenomenal consciousness or 'what-it-is-like-ness' of 'for-me-ness' is to succumb to a pernicious form of the 'Myth of the Given'.[54].. the sense that there is such a kind of consciousness is an instance of cognitive illusion … The very idea that there is an inner world of qualitative states must be illusory" (Garfield, 2016).

On the other hand, there is rich tradition of Buddhist debate about perceptual consciousness and representationalism: how inner perception articulates with external objects and what we can know about the relationship. The Yogācāra school goes for idealism, "arguing that since direct realism is incoherent, as is representationalism, the direct and only object of conscious experience is an inner state," while its worthy competitor, the Madhyamaka school, "analyzes consciousness, as they analyze all phenomena, as a set of relations, not as an independent phenomenon or characteristic." In this deflationary account, "the illusion that there is a special property or center of consciousness is resolved in favor of a network of processes" (i.e., perceived object, sense organ, sensory system, conceptual system) (Garfield, 2016).

From the Madhyamaka perspective, all that we lose is "the illusion that there is more in conscious experience than the psychology and physiology of experience. In particular, reference to internal representations, qualia, phenomenal properties and other such ghostly mediators of our experience drop away." Garfield argues that such a more naturalistic, more public (less private) view "forces the theorist who takes

[54] "The Myth of the Given is the myth that there is some level of our experience that is immediate, immune from error, given to us, as opposed to constructed, and that this level of experience constitutes the foundation or transcendental condition of the possibility of knowledge of anything else" (Garfield, 2016).

something like the qualitative character of experience to be real, and to be essential to consciousness, to defend and not to presuppose that view" (Garfield, 2016).

To go deeper into Buddhist consciousness is to go "empty." Emptiness is a foundational concept in Buddhism and is easily misunderstood (and inappropriately ridiculed). Simply put, "Emptiness is the lack of any intrinsic nature, not another intrinsic nature instead of those we naively superimpose on entities." Emptiness, Garfield stresses, is never "emptiness of existence" but rather "always emptiness of some more determinate metaphysical property." As Garfield explains the doctrine of the "two truths," illuminating Nāgārjuna (c.150 - c.250 CE), perhaps Buddhism's greatest philosopher-saint (other than the Buddha, of course), "nothing turns out to be ultimately real, everything is merely conventionally real, and the ultimate and conventional truths, while radically different in one respect, are in fact identical in another. That is the profound doctrine of the emptiness of emptiness" (Garfield, 2016).

Applied to consciousness, if phenomenal consciousness, like everything else, is empty of intrinsic nature, its claim of qualitative distinction from all other phenomena, its claim of radical subjective experience as a nonpareil occurrence in the cosmos, would seem to weaken. Moreover, though debate abounds, whereas Madhyamaka "takes all phenomena, including mind and the external world, to be conventionally real but ultimately empty, and to be interdependent, Yogācāra takes external objects to be mere appearances to mind, to be utterly non-existent, and takes mind to be the substantially real subjective substrate of those representations," confirming the Yogācāra position as idealist (Garfield, 2015).

That Buddhism rejects the self, asserting that we are persons, not selves, makes for fascinating explorations (Garfield, 2022). Debate has continued whether the Buddhist "*Atman*," often translated self or soul, is permanent and unchanging, a position that Buddhist traditions and texts largely reject. No matter. The nature of the Buddhist non-self (or self) or the Buddhist person does not seem to much affect the deflationary nature of Buddhist consciousness. Self, non-self, person—phenomenal consciousness is the same empty illusion.

16.3. *Dao De Jing's constant dao*

Among my favorite lines in all philosophical literature are the deceptively simple opening lines of the *Dao De Jing*, the Chinese classic text that is the foundation of Daoism. "The *Dao* [Ultimate Reality, Way] that can be spoken of [expressed] is not the Constant [Eternal] *Dao*; the Name that can be named [understood] is not the Constant [Eternal] Name" (道可道非常道; 名可名非常名). "*Dao*" (道) refers to "Ultimate Reality" but also means "Way" or "Path." "Constant" comes from "*Chang*" (常), which also means "invariable" and may connote "eternal." "Name" comes from "*Ming*" (名), which also means "to name," and as a homophone of the character "*Ming*" (明), may connote "to understand." The verses are nuanced, even vague, perhaps deliberately so, allowing high variance in interpretive translation. The core sense, however, seems to be that whatever you think the *Dao* may be, it is not that, and whatever you think the Name may be, it also is not that.

Sinologist and translator Joseph Pratt says it's hard to read those first lines and not think that the *Dao* is the source and manifestation of conscious experience or awareness and not think that the Name is the related cognition or thoughts. Supporting evidence comes from the *Dao De Jing's* Chapter 42 cosmogenic process: "The *Dao* begets the One, the One begets the Two, the Two begets the Three, the Three begets the Ten Thousand Things" (which includes human beings) (Pratt, 2020).

In short, the *Dao* (or Consciousness) and the Name (or Cognition) are both "Constant" or "Eternal" (常), giving rise to the YinYang of Consciousness and Cognition and eventually to the individual phenomenological dynamic of Consciousness, including Cognition and Form/Thinghood. So, in this ancient text, according to Pratt, consciousness is really the first thing and the last thing.

Moreover, the *Zhuangzi*, the other of Daoism's main founding texts, refers frequently to the ideal of a flow state, including in the context of armed combat. Though sometimes considered to be an "unconscious" or "less conscious" condition, from the Daoist perspective a flow state is a deeper state of consciousness. Both the *Zhuangzi* and the *Dao De Jing* could be considered guides for cultivating such a condition (Pratt, 2020, 2023).

Personally, my long interest in the *Dao De Jing's* opening verses is rooted in my long interest in Nothing, the metaphysics/ontology of Leibniz's haunting question, "Why is there Something rather than Nothing?" "Why is there anything at all?" In my essay, "Levels of Nothing," I pose nine levels of increasing Nothingness (or decreasing Somethingness). If consciousness is not fundamental, it would disappear at the most simplistic level of Nothing, Nothing Level 1. If consciousness is fundamental, it wouldn't disappear until Nothing Level 7 (Kuhn, 2013).

16.4. *Kastrup's analytic idealism*

Philosopher Bernardo Kastrup's "analytic idealism" is "a consciousness-only ontology" that has refocused attention, within the philosophical community and more broadly, on metaphysical idealism, that is, an idealism that is grounded in philosophical argument as opposed to promoted by religious tradition or spiritual belief. Kastrup's modern, analytic version of the ontology of idealism asserts "(a) phenomenal consciousness, as an ontological category, is fundamental; and (b) everything else in nature can ultimately be reduced to, or grounded in, patterns of excitation of phenomenal consciousness." (Kastrup, 2019). Thus, he proposes "there is only cosmic consciousness" (Kastrup, 2018), in that "spatially unbound consciousness is posited to be nature's sole ontological primitive" (Kastrup, 2017).

In Kastrup's idealism, human beings, along with all other living organisms, are but "dissociated alters of cosmic consciousness" (Kastrup, 2018), that are "surrounded like islands by the ocean of its mentation." The inanimate universe we see around us, he says, is "the extrinsic view of thoughts and emotions in universal consciousness. The living creatures we share the world with are the extrinsic views of other dissociated alters of universal consciousness. A physical world independent of consciousness is a mistaken intellectual abstraction" (Kastrup, 2016a,b)

Evidence that consciousness is not reductionist-materialist, Kastrup argues, comes from, among others, neuroimaging of brains in altered states induced by psychedelic substances. That these "unfathomably rich experiential states" correlate with significantly reduced activity in multiple brain areas is said to "contradict the mainstream metaphysics of physicalism for obvious reasons: experience is supposed to be generated by metabolic neuronal activity." He dismisses "the best physicalist hypothesis to explain psychedelic experiences" based on the idea that psychotomimetic drugs cause brain desynchronization, processes labeled "brain entropy," "complexity," "diversity"—which Kastrup interprets as "very straightforward: brain *noise*." The "entropic brain hypothesis" (9.5.6), Kastrup says, is "a linguistic charade," leaving mainstream physicalism unsupported as a viable metaphysics of mind (Kastrup, 2023). (Neuropsychopharmacologist David Nutt contends that "we don't need to adopt an untestable metaphysical worldview to explain the subjective richness of psychedelic experiences" and that neuroscience and neuroimaging research have resources to develop complete theories—for example, chaotic cortical entropy may "release the usual brake" that the cortex holds on sub-cortical structures, especially the emotion centers, liberating the amygdala and hippocampus from "top-down" inhibitory control [Nutt, 2023]. Kastrup counters that such disinhibition, if it were the case, should itself correspond to increased brain activity somewhere in the brain, which is not what is observed.)

How to explain, under idealism, the correlation between inner experience and brain states? According to Kastrup, "the brain and its patterns of neuronal activity are not the *cause* of inner experience, but the *image*, the extrinsic appearance of inner experience. In other words,

brain activity is what inner experience *looks like* when observed from the outside." As such, he says, "the correlations ordinarily observed between patterns of brain activity and inner experience are due to the trivial fact that the appearance of a phenomenon correlates with the phenomenon." And when this correlation is broken, as observed in the psychedelic state, the reason is that, "unlike a *cause*, the *appearance* of a phenomenon doesn't need to be always *complete*"—it can leave out much about the phenomenon it is an appearance of (Kastrup, 2023).

Kastrup maintains that idealism's key challenge is "to explain how the seemingly distinct phenomenal inner lives of different subjects of experience can arise within this fundamentally unitary phenomenal field." This is called the "decomposition problem" and it is the core problem Kastrup needs to address. Other challenges include: "how to reconcile idealism with the fact that we all inhabit a common external world; why this world unfolds independently of our personal volition or imagination; why there are such tight correlations between measured patterns of brain activity and reports of experience" (Kastrup, 2019).

Kastrup's unabashed challenge to his metaphysical competitors is that an idealist ontology "makes sense of reality in a more parsimonious and empirically rigorous manner than mainstream physicalism, bottom-up panpsychism, and cosmopsychism" (Kastrup, 2018). He argues that an idealist ontology "offers more explanatory power than these three alternatives, in that it does not fall prey to the hard problem of consciousness, the combination problem, or the decombination problem, respectively." (Panpsychists seem to be taking the challenge more seriously than do physicalists[55] [Kastrup, 2020b; Goff, 2020].)

Given his consciousness-only ontology, Kastrup explores what might follow in two areas of high interest and continuing controversy: foundations of quantum mechanics and prospects for life after death.

Regarding quantum mechanics, he stresses the centrality of consciousness, making the startling but perhaps coherent argument that "the dynamics of all inanimate matter in the universe correspond to transpersonal mentation, just as an individual's brain activity—which is also made of matter—corresponds to personal mentation" (Kastrup et al., 2018).

Regarding life after death, Kastrup speculates that "the implication is that, instead of disappearing, conscious inner life expands upon bodily death, a prediction that finds circumstantial but [claimed] significant confirmation in reports of near-death experiences and psychedelic trances, both of which can be construed as glimpses into the early stages of the death process" (Kastrup, 2016a,b).

Say this for Kastrup's analytic idealism: it expands and enlivens the consciousness debate.

16.5. Hoffman's conscious realism: the case against reality

Cognitive psychologist Donald Hoffman's "Case Against Reality" argues that our visual perceptions are not veridical of ultimate reality because evolution selects for fitness to reproduce, not for access to ontological truth (Hoffman, 2019a). "This is consistent with the interface theory of perception, which claims that natural selection shapes perceptual systems not to provide veridical perceptions, but to serve as species-specific interfaces that guide adaptive behavior" (Prakash et al., 2020).

Hoffman likens our perceptions of objects around us to "interfaces" constructed by natural selection, taking as analogy the file icons on our computer screens, which may look like little paper folders but are in truth written in the complex binary code of machine language. Similarly, he says, evolution has shaped our perceptions, not as true depictions of an animal-independent world, but rather as simplistic illusions to help us navigate the world around us (Hoffman, 2019a).

Continuing his computer-screen interface analogy, he says, "The pixels are in the screen, still part of the desktop interface. Similarly, tiny nuclei and electrons are in spacetime, still part of our spacetime interface." But "spacetime is not objective reality and does not resemble reality, whatever reality might be" (Hoffman, 2019b).

Hoffman's ultimate ontology is what he calls "conscious realism," which states that the objective world consists of conscious agents and their experiences. This means, fundamentally, that instead of assuming that "particles in spacetime are fundamental, and somehow create consciousness when they form neurons and brains," he proposes the reverse: "consciousness is fundamental, and it creates spacetime and objects." He posits a mathematical theory of consciousness that "reality is a vast social network of interacting 'conscious agents,' in which each agent has a range of possible experiences, and each agent can act to influence the experiences of other agents."

What follows for Hoffman is that "no object within spacetime is itself a conscious agent; spacetime is simply a format for conscious experiences—an interface—employed by agents like us, and physical objects are just icons in that interface" (Hoffman, 2019b).

Remarkably, Hoffman reverses the arrow of causation for the abundance of experimental evidence correlating mental states of the mind with physical states of the brain. These correlations arise, he states, "because consciousness creates brain activity and indeed creates all objects and properties of the physical world" (Hoffman, 2008).

Hoffman is clear: "Consciousness is fundamental in the universe. It is not a product of space and time or anything inside space and time. I think that efforts to derive consciousness from spacetime, either by identity theories or causal theories, have proven ineffective, and I've been forced to take the view that consciousness is actually fundamental in the universe" (Hoffman, 2013).

16.6. McGilchrist's relational, creative-process idealism

Psychiatrist, neuroscientist, and literary scholar Iain McGilchrist's idealist metaphysics has consciousness as "irreducible, primordial and omnipresent." But consciousness is "not a thing; it is a creative process," he says. "All that exists, exists in consciousness … consciousness is the stuff of the cosmos." Moreover, given "that consciousness is 'the fundamental given natural fact', it clearly follows that it cannot be reduced to something more fundamental" (McGilchrist, 2021b, 2021a, p. 1601).

Matter, to McGilchrist, is "a theoretical abstraction that no one has seen." The term clearly has meaning, he clarifies; "it refers to the qualities of certain elements within consciousness which offer *relative* resistance and *relative* permanence as a necessary part of that creative process" (McGilchrist, 2021b). Matter is also critical for individuality to arise.

Put another way, McGilchrist has matter as "a special case, or a phase of consciousness." Matter is not a separate thing, he says, any more than ice is separate from water; it's a phase of water; it's neither less nor more than water; it's not separate from water; it's a *kind* of water. And matter is a kind of consciousness—for a time—that has certain quite marked properties that are different from the way we normally think of consciousness, just as water is transparent and flows and all the rest, and ice is hard and opaque and can split your head open. So they're different but they're part of the same ontology." McGilchrist stresses that "consciousness and matter must be *distinguished*"—but "there should be no need to set the one against the other."

McGilchrist's consciousness turns on its relational nature. He holds that "everything is relational, and that what we call things, the *relata*, are secondary to relationship." Consciousness, he argues, is always "of" something, then he asks: "what is the nature then of that something that is both in part constitutive *of*, and in part constituted *by*, that relationship?"

A consequence, counterintuitive to most, is that while some scientists consider a "Reality Out There" to be independent of any consciousness whatsoever—naïve realism—McGilchrist says, "In reality, we

[55] See the energetic, illuminating debate between idealist Bernardo Kastrup and panpsychist Philip Goff (Kastrup, 2020b; Goff, 2020).

participate in the knowing: there is no 'view from nowhere'" (McGilchrist, 2021b).

Given that McGilchrist has consciousness as primordial and matter as a phase of consciousness, how does he have the relationship between the brain and consciousness? He says, "I do not suggest that the brain originates anything. I do not know that the brain 'causes' consciousness: it might or might not." He goes on to note, rightly, "I know of no way of proving the point one way or the other, since the observable facts would look the same whether it [the brain] gave rise to, or simply mediated, consciousness." In other words, the same findings are equally compatible with the brain *emitting* consciousness, *transmitting* consciousness, or *permitting* consciousness. (The latter two options are similar, except that *permitting* substitutes the idea of a constraint that is creative, fashioning what it allows to come into being, replacing the merely passive idea of *transmitting*.)" McGilchrist argues that "it is the last of these possibilities – *permitting* – that is the most convincing" (McGilchrist, 2021a, pp. 55, 1592).

Logically, McGilchrist's ontology would skew to the brain alone not causing consciousness and his medical training would skew to the brain not being a mere passive receiver of consciousness. His solution seems to be something like this: the brain structures, shapes and physically actualizes the consciousness we experience so that it can be expressed and felt by a body.

It's worth noting that McGilchrist's consciousness-matter ontology has a kind of relationship to his hemisphere hypothesis, which states that the brain's "two hemispheres have evolved so as to attend to the world, and therefore bring into being the only world we *can know*, in two largely opposing ways: the left hemisphere paying narrowly targeted attention to a detail that we need to manipulate; the right hemisphere paying broad, open, sustained, vigilant, uncommitted attention to the rest of the world while we focus on our desired detail" (McGilchrist, 2009, 2021a).

This means, he argues, that "each hemisphere brings into being a world that has different qualities … In the case of the left hemisphere, a world of *things* that are familiar, certain, fixed, isolated, explicit, abstracted from context, disembodied, general in nature, quantifiable, known by their parts, and inanimate. In the case of the right hemisphere, a world of *Gestalten*, forms and processes that are never reducible to the already known or certain, never accounted for by dissolution into parts, but always understood as wholes that both incorporate and are incorporated into other wholes, unique, always changing and flowing, interconnected, implicit, understood only in context, embodied and animate" (McGilchrist, 2009, 2021a).

Most importantly, the world of the right hemisphere is the world that *presences* to us, that of the left hemisphere a *re*-presentation: the left hemisphere a map, the right hemisphere the world of experience that is mapped." To McGilchrist, loosely associating the right hemisphere with consciousness and the left hemisphere with matter may be more than metaphor.

Finally, McGilchrist sees "the cosmos as fundamentally relational, and the ground of Being as driven to come to know itself in and through creating an evolving cosmos. The ground of Being and the cosmos respond to each other. (So far this is in keeping with Whitehead.) What life does is to increase by untold orders of magnitude the responsiveness of that cosmos. I, like Nagel, see that 'value is not just an accidental side-effect of life; rather, there is life because life is a necessary condition of value.'" What life brings, McGilchrist maintains, "is not consciousness, then—which, as I have argued, is present from the beginning—but the coming into being of the capacity for value: thus, a mountain cannot value, though it can have value for creatures, like ourselves, who value. And it is not just we, but all living creatures, that for the first time are able to recognize value. Life vastly enhances the degree of responsiveness of, to and within the world." Indeed, "life could be seen as the very process of the cosmic consciousness continually both discovering and furthering its beauty, truth, and goodness; both contemplating and (not separately but in the same indivisible act) further bringing them into being: a process" (McGilchrist, 2021a, pp. 1722, 1723).

Yet, the grounding of consciousness is not deterministic, McGilchrist says. It has none of the characteristics of being pre-programmed by "an omnipotent and omniscient engineering God constructing and winding up a mechanism. It is in the process of discovering itself through its creative potential (one thing we all know directly from our own experience is that consciousness is endlessly creative)" (McGilchrist, 2021a). The cosmos has purpose, McGilchrist says. "It has direction, but not direction of the hydraulic kind, being pushed blindly from behind, rather of the kind that is drawn from in front, by attractors that call it ever forward" (McGilchrist, personal communication).

16.7. Chopra's only the whole is conscious

Holistic physician Deepak Chopra defines consciousness as "It is what makes experience possible. It is what makes perception possible. It is what makes cognition possible. Everything we call reality, consciousness makes possible. Consciousness is the ultimate reality" (Chopra, 2013).

To Chopra, progress in cognitive neuroscience, such as brain scans that translate electrical patterns in the brain into real words in synthesized speech, are "false clues," like tracking a fox in the snow only to find that the tracks have led you in a circle. "This looks like progress," he says, "and yet the progress is built up from false clues, for the same reason that pertains to circular tracks in the snow. It is physically impossible for brain cells to create the human mind. Brain cells are composed of the same basic organic chemicals as any other cell in the body, and organic chemicals can't think. It doesn't matter how many billions of neurons the human brain contains, or the quadrillions of synaptic connections between them. Complexity doesn't get around the simple impossibility that chemicals aren't conscious, and the brain is nothing but chemicals. The presence of electrical activity in the brain is also a false clue, because electricity can't think, either" (Chopra, 2023a, b). "If you want to understand consciousness, then the last thing you want to be is a neuroscientist," Chopra half-jokes, referring to my/RLK background. "Because neuroscience doesn't give you a clue" (Chopra, 2013).

Chopra's persistent claim is that there is only one way to get past every false clue in the hunt for consciousness. "You must make it the 'stuff' of creation, a non-physical state from which matter, energy, time, and space are created. It is not, he says, that every phenomenon we can experience has consciousness or exhibits mind. It is that consciousness shapes itself into every mode of knowing and experiencing reality." In other words, Chopra says, "the 'hard problem' isn't a problem at all. Consciousness, being our source and origin, explains everything by itself, needing no outside explanation" (Chopra, 2013).

According to Chopra, taking idealism to its logical extreme—some say to its simplest condition—what's conscious is only the whole, not the parts like us. The entirety of reality, the fullness of the cosmos, a multiverse of innumerable universes (if there are such), everything everywhere all together, is the expression of a unitary consciousness.

In their essay, "Why You Aren't Conscious and Never Have Been," Chopra and physicist Menas Kafatos, after rejecting both materialism and panpsychism, seek to explain consciousness not by trying to figure out how individuals are conscious, which they claim is doomed to failure, but rather by assuming that all reality is conscious and individual instances of consciousness are conscious only with respect to their being part of the whole. "When you arrive at the conclusion that nothing material is conscious, bizarre as this sounds, you make a tremendous breakthrough. 'I am conscious' misstates the reality, which is 'I am consciousness itself'" (Chopra and Kafatos, 2023).

"The way that humans are conscious is what matters," the authors write. "Consciousness is everywhere all the time embracing past, present and future. I am part of that reality. Therefore, I am consciousness itself. Who I really am is beyond time."

Nothing can be conscious on its own, Chopra and Kafatos claim; the

only way to be conscious is to be part of the "All and One." As for where the All-and-One Consciousness comes from or came from, the answer is the same as to "Who made God?" "Our origin story begins with absolute, pure awareness, which has no explanation. It simply is" (Chopra and Kafatos, 2023).

16.8. How consciousness becomes the physical universe

Idealism works well as an explanation of creature consciousness, provided, of course, that one accepts its foundational premise that consciousness, and consciousness alone, is fundamental reality. One challenge for idealism is coming to consider what seems to be an odd, perhaps outlandish, idea so alien to our life experiences: If all is consciousness, how does the physical world come about?

The claim is made that quantum theory, which, unlike classical physics, assigns (in some interpretations) a fundamental role to the act of observation, can bridge the explanatory gap between idealism as foundational reality and the physical world as empirically apparent. Can quantum theory, as its adherents believe, open the door "to a profoundly new vision of the cosmos, where observer, observed, and the act of observation are interlocked," thus hinting "at a science of wholeness, going beyond the purely physical emphasis of current science?" Adherents look to developments in the intersection of quantum theory, biology, neuroscience and the philosophy of mind. Non-local interactions of the quantum universe are cited as evidence of the interconnectedness of everything, supporting the idea that "consciousness and matter are not fundamentally distinct, but rather are two complementary aspects of one reality, embracing the micro and macro worlds," ultimately founded on consciousness as the ultimate reality (Kafatos et al., 2011).

There are elaborate theories that claim to explain how consciousness, once assumed to be fundamental in nature and reality, generates or interacts with matter and energy and interfaces with the brain. In one version, developed by computer science professional Mahendra Samarawickrama, consciousness governs causation and creates energy and matter. The interplay of consciousness, matter and energy underpins what we experience and observe in reality (Consciousness Studies, Australia, 2024). Consciousness itself is "a high-speed sequential process that leads to awareness" (notwithstanding the brain's massive parallel-processing capability). "Like time, consciousness is also subjected to relativity. When the observer is moving, both time and consciousness dilate." Further, "the electromagnetic energy of consciousness follows quantum principles and wave-particle duality …. This interplay of consciousness with matter and energy makes consciousness and reality interrelate and follows determinism, realism, and physicalism" (Samarawickrama, 2023).

No surprise that none of this is taken seriously by a large majority of quantum physicists (Rovelli, 2022) (11.16).

16.9. Goswami's self-aware universe

Quantum physicist Amit Goswami proposes that consciousness, not matter, is the primary "stuff" of creation, and indeed it is consciousness that creates the material world, not the other way around. He uses quantum physics, particularly the Copenhagen interpretation (where an "observer" is required for the collapse of the wave function), to disabuse us of the false notion that matter is simple, solid and foundational. Consciousness, he says, "is the agency that collapses the wave of a quantum object, which exists in potentia, making it an immanent particle in the world of manifestation" (Goswami, 1993; Woronko, 2020).

Goswami sees Idealism as not only the most parsimonious theory of consciousness but also mitigating and perhaps solving the famous paradoxes of quantum mechanics, such as entanglement, superposition and non-locality.

The key, Goswami offers, is that there is only one consciousness in the universe, one subject of experience, in which we all (somehow) participate. The ego, he says "is constricted consciousness, much like a localized object. You cannot understand consciousness without experiencing expanded states of consciousness."

Consciousness, according to Goswami, plays an active role in constructing physical reality by "choosing" the results of a measurement. He views our mental activities, our thoughts and feelings, as "mental objects" in a sense similar to material objects, subject to the same laws of physics, particularly quantum mechanics. Thus, Goswami envisions the brain, not simply as a passive measuring device that intervenes in the quantum world, but more significantly as an active quantum system that selects and determines which unconscious processes become conscious. Goswami concludes that all creation is interconnected, including us (Goswami, 1993).

16.10. Spira's non-duality

Spiritual teacher (and pottery artist) Rupert Spira espouses non-duality as "the recognition that underlying the multiplicity and diversity of experience there is a single, infinite and indivisible reality, whose nature is pure consciousness from which all objects and selves derive their apparently independent existence." He states, "The greatest discovery in life is that our essential nature does not share the limits or the destiny of the body and mind" (Section: Spira, n.d.).

To Spira, a non-dual understanding addresses two essential questions: one, "How may we be free of suffering and find the lasting peace and happiness for which all people long above all else?", and two, "What is the nature of reality?" While the first is most meaningful to individuals and to the global community, only the second is relevant for this Landscape.

Spira begins his non-dual teaching with an investigation into the essential nature of our self, and it is this "clear knowledge of oneself," he says, that is also the basis of the second aspect of the non-dual understanding, "namely, the recognition that reality is an infinite, indivisible whole, made of pure consciousness, from which all separate objects and selves borrow their apparently independent existence." Everything we know or experience, he states, "is mediated through the mind, and therefore, the mind's knowledge of anything can only ever be as good as its knowledge of itself. In order to know what anything truly is—that is, what reality truly is—the mind must first know its own essential nature. Therefore, the investigation into the nature of the mind must be the highest endeavor upon which any mind can embark, and the knowledge of its essence or nature the highest knowledge."

Spira suggests that approaching non-duality as a means of finding an answer to the ultimate question about the nature of reality "is found at the heart of all the great religious and spiritual traditions." For instance, "In Christianity, it is said, 'I and my Father are one'. That is, the essence of our self and the ultimate reality of the universe are the same." Similarly, "in the Sufi tradition, 'Whosoever knows their self knows their Lord'. That is, whoever knows the essential nature of their self knows the ultimate reality of the universe." And "in Buddhism, 'Samsara and Nirvana are one', meaning the nature of the world and the essence of the mind are identical" (Spira, n.d.).

16.11. Nader's all there is

Transcendental Meditation leader (and former neuroscientist) Tony Nader states "there is nothing other than consciousness, and that matter and the multiplicity of loci of consciousness, us, for one, are nothing but consciousness experiencing itself from limited perspectives that hide the true nature of both the observer and the observed." In a world of an infinite number of simultaneously existing possibilities, Nader says "one fact seems undeniable: the fact of our own awareness … Commonly, this awareness is called consciousness: the observer, the witness, the experiencer" (Nader, n.d.).

Nader states formally, "Consciousness is all there is and does not create anything physical outside itself; matter is real only in terms of

consciousness or as an appearance within consciousness." While "Consciousness is all there is" and "Consciousness is One" are his foundation, Nader acknowledges that "there are different kinds of consciousness: different flavors, states, levels, and so on. The only way for these two statements to be simultaneously true, he says, is that the one Consciousness has different flavors, states, and experiences of itself" (Nader, 2015).

While acknowledging that other Idealism theorists suggest similar, Nader differentiates his approach by providing "a carefully constructed and cogent model for how those limited perspectives in all their subjective richness emerge within the singularity of consciousness." He claims "a monistic field theory of consciousness" as the most primordial field, which then can "potentially solve enduring problems in other fields, including quantum field theory and the psychology of higher states of consciousness" (Nader, n.d.).

Nader's distinguishing proposal is to place consciousness "in a mathematical framework by introducing fundamental axioms that are motivated by the experience and dynamics of consciousness." By systematizing how human awareness perceives, discriminates, organizes, and expresses its own patterns of functioning, mathematical methods and mathematical modeling provide "one of the most useful and scientifically manageable methods to study the interface between consciousness and physical phenomena." Mathematics is seen as "the precise abstract representation of consciousness at work."

Nader claims "to test the reasonableness of these axioms in two ways: by deriving consequences from the axioms and comparing these consequences to our experience of the world, and by verifying that heretofore unsolved problems can be resolved with this new paradigm." In particular, he ambitiously addresses how the physical universe emerges from consciousness.

Nader introduces "the notion of a Bit of Consciousness as a triple of particular values of Observerhood, Observinghood, and Observedhood," with the understanding that "nothing can be said to be real unless it is a triple with none of its components equal to 0. In other words, real existence requires an observer, a process of observation, and an observed" (Nader, 2015).

In Nader's consciousness model, it is not non-localized or localized objects that are the issue. Rather, it is the idea of the very existence of objects as entities independent of Consciousness that is the root of the problem. In his model, nothing exists outside the realm of observer, observed, and process of observation (Nader, 2015).

16.12. Ward's personal idealism: souls as embodied agents created by God

Philosopher-theologian Keith Ward's "personal idealism" integrates his philosophical convictions about consciousness and souls, idealism in Eastern traditions, and his Christian faith (Ward, 2022). It's a heady brew.

Ward describes souls as "the embodied agents which are created by God." To build his case, he cites the "huge gap in modern culture between neurophysiologists and old-fashioned philosophers" (musing, "We thought we were very trendy in our time"). It's a fundamental, philosophical divide, he says, and from his perspective, he begins from consciousness, puts consciousness first, because "this is where all knowledge starts … your starting point is perception, a set of perceptions, a set of concepts. And from that, you build up a picture of what the world is like" (Ward, 2006).

Ward stresses "you can never get rid of consciousness." He is firm: "From where I sit, I can just say whatever view you come up with, consciousness is not reducible to particles which are publicly observable in space and time." He is adamant: "I will just not give way on this—because it seems to me so obvious; I don't see how anyone can deny it." Responding to questions about the putative illusion of conscious unity, Ward is dismissive (politely): "You're inventing a problem."

Ward's idealism surfaces when contrasting dualism. His claim, even for explaining Descartes, is not that mind and body/brain are separate substances that must somehow interact, but rather are subject and object, the thinker and perceiver as the subject who is aware of its perceptions and which is engaged in having its thoughts. "What you've got is a subject thinking. The subject is not a different substance."

Ward then rationalizes his idealism. "The whole world is actually a construct with perceptions and feelings and thoughts. But the agent who is having these perceptions, the perceiver, the thinker, is not another thing somewhere. So, subjects and objects are always together. There's no subject without an object. There's no mind without some objectivity, some environment in which it's embodied. That's why I see embodiment as an essential part of mentality, and of being a person. When you're talking about the mind, you're talking about a subject, an embodied subject, who nevertheless is not to be identified simply by physical facts which are publicly observable. I think that's what the soul is: An embodied subject of intellectual and moral agency" (Ward, 2006).

16.13. Albahari's perennial idealism

Comparative philosopher Miri Albahari defends "Perennial Idealism" as a mystical solution to the mind-body problem. She faces the "vicious dilemma" of subjects arising from unconditioned consciousness. "If the manifest world of subjects is real, it irrevocably undercuts the purely unconditioned nature of the ground by imposing boundaries between subjects and the ground. If only the ground is real, we have the seemingly absurd consequence of denying reality to what seems undeniably existent." She finds resources in the modern mystic, Sri Ramana Maharshi, who was recorded as saying, "Nothing exists except the one reality … The one unity alone exists ever. To such as find it difficult to grasp this truth and who ask, 'How can we ignore this solid world we see all around us?' the dream experience is pointed out and they are told, 'All that you see depends on the seer. Apart from the seer, there is no seen.'" (Ramana is expressing what is known in Advaita Vedanta as the ajāta doctrine, which means "not created, not caused".) (Albahari, 2019a).

Albahari takes as evidence "first-person accounts from people who claim to have experienced and indeed permanently established themselves in aperspectival or nondual consciousness," mystics from across traditions and centuries who came to believe that they "have directly 'awoken' to their abiding nature as aperspectival consciousness, realizing it to be none other than the ultimate ground of what we take to be the world." The "central metaphysical content of this allegedly recurring insight" has been termed by Aldous Huxley and others, "Perennial Philosophy" (Huxley, 1946), from which Albahari's "Perennial Idealism" denotes its philosophical parentage (Albahari, 2019a).

Albahari posits her Perennial Idealism as "a radical new successor to Cosmopsychism," which, erroneously, she argues, "takes the entire externally specified cosmos to be an internally conscious subject" (13.3). This brings "serious troubles for Cosmopsychism," which not only "typically casts the entire cosmos as a conscious subject" but also "in turn grounds the consciousness of subjects such as ourselves" (Albahari, 2019b). The most promising way forward in the mind-body problem, she argues "is to renounce the pervasive panpsychist supposition that fundamental consciousness must belong to a subject. This extends the reach and scope of consciousness to ground not merely to the inner nature of the cosmos, but everything we take to be the world, with its subjects and objects" (Albahari, 2019a). This, Albahari concludes, "offers a framework for thinking about how the world could be grounded in a universal consciousness which, following Advaita Vedanta and the 'Perennial Philosophy', is not structured by subject or object" (Albahari, 2019b).

16.14. Meijer's universal knowledge field

Biomedical scientist Dirk K. F. Meijer explains consciousness in the

context of a "Universal Knowledge Field" (UKF), the concept that a collective storage of all information that is present and/or evolves in our universe can take a universal character and that all information is present in a general knowledge field. Other names for the UKF, he says, include Universal Consciousness, Cosmic Consciousness, Universal Mind, Universal Memory, Universal Intelligence, Holographic Memory, Collective Consciousness, Implicate Order and the Plenum. The UKF is said to be consistent with fundamental physics, cosmological and holographic models. In addition, universal consciousness can be approached from transcendental human experience, including transpersonal and psi phenomena (Meijer, 2018).

Meijer claims that integral information processing in the universe is based on a generalized musical-scale of discrete electromagnetic field (EMF) frequencies and that the biophysics literature reports the effects of similar EMF frequency patterns in a wide range of animate and non-animate systems. This provides a conceptual bridge between living and non-living systems, relevant for biophysics, brain research, and biological evolution. He proposes that the pro-life EMF frequency bands may literally act in concert as a "tonal octave-based symphony" to provide living systems, including the brain, with information embedded in such harmonic-like resonance patterns. Such "tonal" projections, in a global manner, may organize synchronicity, both spatially and temporally in essential organs in the body: heart and brain (Meijer et al, 2020, pp. 1–31).

Thus, if nature is guided by "a discrete pattern of harmonic solitonic waves," since the whole human organism, including brain, is embedded in this dynamic energy field, a comprehensive model for human (self-) consciousness could be conceived. This implies an intrinsic cosmic connectivity that is mirrored in the human brain. An assumed "hydrodynamic superfluid background field" is proposed to guide the ongoing fabric of reality through a "quantum metalanguage" that is instrumental in the manifestation of universal consciousness, of which human consciousness is an integral part (Meijer et al, 2020, pp. 72–107).

Meijer proposes a "pilot-wave-guided supervenience" of brain function that may arise from a "holofractal memory workspace" associated with, but not reducible to the brain, which operates as a scale-invariant mental attribute of reality. This field-receptive workspace integrates past and (anticipated) future events and may explain overall ultra-rapid brain responses, as well as the origin of qualia (Meijer et al, 2020, pp. 31–71).

16.15. Idealism's imaginative expressions

As creator and host of *Closer To Truth,* I receive ideas from viewers globally. These unsolicited papers are often elaborate treatises, the majority of which focus on consciousness or cosmology. I look at all of them, keep an open mind with at least one eye skeptical, learn some, respond as I can. I marvel at the passion and respect the dedication.[56]

Addressing the "ultimate questions" of cosmic existence and human sentience is the highest calling of human beings, which is why I appreciate diverse ideas (Kuhn, 2023). While I cannot agree with many of the assumptions, and certainly not with most of the assertions, I see the scope of subjects as exemplifying the kinds of issues and challenges that enliven the human spirit (small "s").

To conclude this section on Idealism, I note several models of idealism I've received (among many). The only judgment I pass is that consciousness in general, and idealism in particular, fire the imagination as well as stir the passions.

Flip-Book Idealism (FBI), developed by neuroscientist Silvia Paddock and physicist Thomas Buervenich, agrees with other forms of idealism that spacetime is not primary and that consciousness exists outside of it. According to FBI, observer/participants, who are individuations of this consciousness, detect patterns in a facet of consciousness called the "Urgrund"—the fundamental essence of existence—and shape this information into frames of experience by translating complex signal patterns into qualia. One hallmark of FBI is that the generation of experiential frames by consciousness creates the arrow of time. Its observer-based viewpoint of reality aligns with quantum mechanics, such that wave-particle duality and entanglement ("spooky action at a distance") are no longer odd or mysterious. FBI distinguishes itself from other forms of idealism by asserting that conscious agents primarily interact with one another through the intermediary of the Urgrund in a kind of question-and-answer game and by proposing that spacetime is a set of rules that consciousness needs to adhere to when creating experiential frames to allow for the experienced world to be consistent. FBI does not solve the hard problem of consciousness but attests to its significance (Paddock and Buervenich, 2023). According to reviewer Jo Edwards, "The central idea is that our subjectivity is the inherently conscious universe enjoying local snapshots in discrete time 'frames', set by brain interactions, that are elided into a sense of movement and continuity, as for a cartoon flipbook." He concludes that the authors make "a nice case for these being fundamental time units that in the brain are a few milliseconds long but elsewhere will follow rules of quantum field theory—perhaps as decoherence intervals. I think this is the right direction to go in. It is nice to see mainstream quantum theory rather than fringe interpretations or invocations of entanglement, tachyons, or dark matter. Like genes, consciousness is likely to be based on kitchen sink biophysics" (Edwards, 2024).

Rodrigues's C-Pattern Theory. Neuroscientist Pablo Rodriguez posits that the brain can generate only c-patterns, no experiences, because experiences are qualitatively different from matter. Experiences are thus regarded as created by the universe, in that c-patterns are constantly "read" and converted to experiences. C-Pattern Theory has three basic points. First, the brain doesn't generate conscious experiences; it generates c-patterns, which are complex geometric three-dimensional structures composed of all action potentials from all of the brain's [relevant] neurons firing at any given moment. The c-pattern's specific form and geometry is postulated as being what fully defines any conscious experience. So, for every moment, there's a different c-pattern and a corresponding experience defined by it. Second, an experience is defined by a c-pattern's form, but each is created by the universe, not by the brain; rather, a c-pattern's specific form and geometry encodes an experience as a discrete expressions of a universal geometric experience language, which the universe understands perfectly and decodes into real, actual experiences. Third, we are not body and brain; we are consciousness. If c-patterns are mere symbols converted to experiences, then only consciousness can be what's having all experiences. And as we are the ones experiencing, we are parts of consciousness. Different organisms have different c-patterns, experiences, and levels of understanding reality. So, this world is just what our c-patterns currently allow, until we manage to expand them to the next level. Thus, true human progress is possible only if the experience language is deciphered and c-patterns are expanded towards greater understanding (Rodriguez, 2023).

The Meaning of Life. The primacy of consciousness explored via science and logic, without leaping to faith or spiritual awakening. It dissects the mind-body-spirit conundrum and provides a theory of everything that posits that reality is an agreed-upon hallucination. It includes the probative power of optical illusions, why linear time is a stubborn illusion, and the roles that beauty, love, and creativity play to help shape reality (Forrest, 2021).

Is-Ness. All consciousness is one. Every human spirit is unique, with

[56] *Closer To Truth* viewers come from ~190 countries. The passion to explore ultimate questions of cosmos, consciousness, and meaning brings together diverse countries, regions, religions, races, ethnicities, genders, ages, educational levels, income levels, and social classes. The only thing we all have in common is the pursuit of these ultimate questions: expressing wonder and awe, willing to hear diverse views. But this "only thing" is a "big thing." We all face the mysteries of cosmic existence and human sentience—the human condition, aspiration and spirit that unify us all.

our singular thoughts, perceptions and experiences, like a whirlpool in an infinite ocean of consciousness. While universal consciousness is infinite in space and time, each conscious being experiences creation from a unique perspective. The power of spirit does not come from its past achievements or future aspirations, but from its existence in the present instant. This is the essence of our existence. Awareness of this essence is the state of "Is-Ness" (Koyoti, 2023).

Consciousness from Non-Self in Buddhism. Consciousness in the sense of qualia and self-consciousness are not a two-tier, parallel relationship like that of the Cartesian Theatre or "Cogito, ergo sum", but a one-tier, serial relationship. The sense of self just emerges out of the process of alternating "awareness" and "awareness of awareness." This view on consciousness comes from an interpretation of "non-self" in Buddhism. Conversely, it also provides insight into consciousness-only and *anatta* (from "non-self" to "emptiness") in Buddhism: in reality, there is neither subject nor object of "awareness" (or "consciousness"). According to Yogācāra, there is no object of awareness (or consciousness). Therefore, the mystery behind "consciousness-only" should be how consciousness arises. However, according to Madhyamaka, there is even no consciousness and everything is empty (Huang, n.d.).

Consciousness's Platonic Computation. Consciousness (the power to conceive, perceive and be self-aware) is the most fundamental and irreducible existence. Creation of all else is rendered by the "Platonic computer" that is made by, of, with and from Consciousness. The hypothesis of "Platonic computation" offers a solution to the inverse hard problem of consciousness: how matter arises out of consciousness (Duan, n.d.).

Hawkins's Map of Consciousness. Psychiatrist and spiritual teacher David Hawkins claims human consciousness comes arrayed with 17 levels and associated "energy fields," with the "frequency" or "vibration" of energy increasing with each rise in level, along with corresponding implications for emotional tone, view of God, and view of life. Consciousness is pervasive, connecting to God via "devotional nonduality" and enabling, at its higher levels, a beneficial and healing effect on the world. Hawkins says his scientific framework elucidates the spiritual levels delineated by saints, sages and mystics, with highest levels representing Self-realization, the void, nothingness vs. allness, full enlightenment, and divine realization.[57] (Hawkins, 2014; Hawkins, n.d.).

17. Anomalous and altered states theories

Can nonphysical consciousness (or realms) be revealed or accessed via anomalous, psi or paranormal phenomena—extrasensory perception (ESP), out-of-the-body experiences (OBEs), near-death experiences (NDEs), and the like? Psychical research beginning in the late 19th century and parapsychology in the mid-20th century sought to study the phenomena scientifically.

To those who believe in its existence—researchers and general public alike—the reality of psi/paranormal phenomena leads directly to consciousness being nonphysical, as well as to nonphysical modes of mental existence, whether as individual "spirits" or "souls" or in the broader sense of nonphysical realms of parallel worlds (Radin, 2007; Schlitz, 2007; Tart, 2007). There are innumerable reports of ESP—telepathy, clairvoyance, precognition, psychokinesis—the vast majority anecdotal, some research-based; believers ("sheep") and skeptics ("goats") remain equally adamant in their convictions. Moreover, even among psi-sheep researchers, there are replicability problems and a possible paradox of confounding interactions between the researcher (the observer) and the experiment (the observed) (Rabeyron, 2020).

For the record, I remain skeptical regarding the overwhelming majority of anecdotal paranormal stories and circumspect regarding statistically significant research affirming psi. I consider likely drivers to be illusion, delusion, fraud, imperfect experimental design, unwitting experimenter bias, ex ante sample selection, ex post data selection, ex post reasoning, and/or plain-old wishful thinking.

Still, I have to say, I generally respect parapsychologists and their experimental designs, and I cannot rule out all paranormal stories. This is why I must consider the profound implications for theories of consciousness if *any* claims of psi and the paranormal would turn out to be veridical. (In context of my skepticism and consideration, and in the spirit of full disclosure, I have a history.[58])

Parapsychologist Dean Radin distinguishes sharply between the words *paranormal* and *psi*. They are not synonymous, he stresses. "The paranormal is a tabloid trope that encompasses Bigfoot, astrology, crystal healing, UFOs, the Bermuda Triangle, etc.," he says. "Equating paranormal with psi perpetuates the idea that psi is part of a great silliness, and this is one of the many reasons why sober academics strictly avoid the topic." By contrast, Radin points out, "psi refers only to common aspects of human experiences reported throughout history and across all cultures, and psi research studies such experiences." Radin acknowledges, "Yes, 95% of these reports may have mundane explanations, but 5% do not. And that 5% changes everything" (Radin, 2024).

Psi research, Radin notes, was "designed explicitly to exclude the illusion, delusion, fraud, p-hacking [misuse of data analysis to report false positives], and the like." He asserts, "There is no better way to demonstrate the current state of the evidence for psi than to read major pro-psi and con-psi articles published in the APA's flagship journal, *American Psychologist* (Cardeña, 2018; Reber and Alcock, 2020). The pro article discusses meta-analyses of 10 classes of psi experiments reported in over 1000 individual studies. In reply, the authors of the con article state up front that they would not address the evidence because – and they actually say this – *psi is impossible*. That's the Spanish Inquisition approach to ignoring uncomfortable facts, and yet that is the state of psi skepticism today" (Radin, 2024).

Cardena's paper, "The experimental evidence for parapsychological phenomena: A Review," clarifies "the domain of psi, summarizes recent theories from physics and psychology that present psi phenomena as at least plausible, and then provides an overview of recent/updated meta-analyses." The evidence, Cardena concludes, "provides cumulative support for the reality of psi, which cannot be readily explained away by the quality of the studies, fraud, selective reporting, experimental or analytical incompetence, or other frequent criticisms." The evidence for psi, he says, "is comparable to that for established phenomena in psychology and other disciplines, although there is no consensual understanding of them" (Cardeña, 2018).

Reber and Alcock's paper, "Searching for the impossible: Parapsychology's elusive quest," presents an opposing perspective to "the general claims of *psi* (the umbrella term often used for anomalous or paranormal phenomena)." The authors mount "a broad-based critique of the entire parapsychology enterprise." Their position is straightforward: "Claims made by parapsychologists cannot be true. The effects reported can have no ontological status; the data have no existential value." Reber and Alcock base their stark conclusion "on well-understood scientific principles. In the classic English adynaton, 'pigs cannot fly.' Hence, data that suggest that they can are necessarily flawed and result

[57] From low to high, Hawkins's 17 levels of consciousness: shame, guilt, apathy, grief, fear, desire, anger, pride, courage, neutrality, willingness, acceptance, reason, love, joy, peace, enlightenment (Hawkins, 2014). I should note that while Hawkins has his acolytes—one of whom implored me to include him on the Landscape—others call him a plagiarist and a charlatan.

[58] I followed parapsychology from my mid-teens though undergraduate years. J.B. Rhine, a pioneer in the field, invited me to do a PhD in parapsychology with him at Duke—which I turned down to do brain research at UCLA (a surprisingly wise choice for a passionate youngster). I continued to follow parapsychology, with decreasing interest, though the 1970s. Decades later, I began again, modestly, on *Closer To Truth*, and now with this Landscape, keeping both skepticism and spirited speculation in a kind of superposition.

from weak methodology or improper data analyses or are Type I errors.[59] So it must be with psi effects." What they find "particularly intriguing is that, despite the existential impossibility of psi phenomena and the nearly 150 years of efforts during which there has been, literally, no progress, there are still scientists who continue to embrace the pursuit" (Reber and Alcock, 2020).

The vast anecdotal literature of near-death experiences (NDEs) and out-of-the-body experiences (OBEs) (17.12), amplified by innumerable (supposed) communications with the dead, also some serious but controversial research, gives rise to beliefs in a sentient afterlife, thus giving apparent credence to non-materialistic theories of consciousness. There are even reports of auras and halos around or emanating from people; some claim to witness, at the moment of death, the soul departing the body. "Terminal lucidity"—unanticipated and unexplained changes in mental clarity, verbal communication, and/or physical capability in the days and hours before death when each patient's medical condition should not allow for such sudden improvements—suggests, to some, that there is something nonphysical going on (Roehrs et al., 2023). Credulous readers will find an inexhaustible supply of NDE/OBE anecdotes and stories, but modest serious research of sound design in which the extraordinary claims are supported unambiguously by extraordinary evidence (to paraphrase Carl Sagan) (I acknowledge claims to the contrary.[60]).

Perhaps the most common claim of "evidence" that consciousness is nonphysical comes from out-of-the-body experiences (Tart, 1987, 2007). Those having OBEs report their experiential awareness to be as a nonphysical entity (spirit/soul) in a nonphysical world. It is all sensorily or perceptibly real, vivid and stable, yet they sense not being in their earthly bodies and not being in our earthly world. The more lucid quality of OBE consciousness (compared to dream consciousness), which is typical of OBEs, convinces OBE adherents of the nonphysical nature of their personal consciousness and the reality of nonphysical realms.

It is no surprise that psi researchers are more compelled by laboratory tests than by OBE/NDE anecdotes. They also point to everyday phenomena that people experience, such as thinking of someone and then getting a text or phone call from them, fueling the sense that it feels too unlikely to be a coincidence.

To philosopher and parapsychologist Stephen Braude, the answer to the mind-body problem depends in part on how much exotic data you are willing to entertain. "If you are willing to look seriously at some of the data suggesting a persistence of personality after bodily death, after the body has decomposed," he says, "then certainly the conventional materialist, neurophysiological view goes out the window" (Braude, 2007a). (For mathematician-astronomer Bernard Carr, paranormal phenomena inform his views of consciousness and the nature of fundamental reality—11.10.)

The fact of the matter—whether such psi/paranormal phenomena have credible claims on reality, or whether they are purely and merely illusion, delusion, poor design or faulty analysis (those that aren't already outright frauds)—is not for adjudication or even for assessment here. (But the wholly skeptical view, personified engagingly by Susan Blackmore, does need voice [Blackmore, 2002, 2007].)

Rather, if any of these psi/paranormal phenomena—even if a minuscule fraction of them—is real and does challenge or defy the laws of physics as currently construed, then non-materialistic theories of consciousness would have to be taken more seriously. This possibility, however remote or however likely, justifies inclusion, at least for me, of psi-motivated theories of consciousness here on the Landscape of possible explanations.

I largely agree with Alex Gomez-Marin: "The study of consciousness requires that we take seriously the many flavors of human experience, particularly those that lie at the edges of what is typically explored scientifically and discussed in public. From psychedelics and synchronicities, to lucid dreaming and psychic phenomena, the 'backdoors of perception' have the potential to transform not just neuroscience and physics but our very understanding of the nature of reality and our place in it" (Gomez-Marin, 2023b). (I am, however, modestly less optimistic that meaningful progress can be made.)

The more general "altered states of consciousness" subsumes diverse deviations from our normal alert, waking consciousness as induced by various physiological, psychological, or pharmacological actions or agents (Altered state of consciousness, 2023). Charles Tart, whose book, *Altered States of Consciousness,* was the first comprehensive treatment of the subject, focuses on the subjective nature of the experience: "Altered states of consciousness are alternate patterns or configurations of experience, which differ qualitatively from a baseline state," stressing "… such that the experiencer feels his consciousness is radically different from the way it functions ordinarily" (Tart, 1969).

Note that Anomalous and Altered States theories, strictly speaking, are generally not theories of consciousness per se in that they are not theories of what consciousness *is*. Rather, they are claimed as evidence of what consciousness is *not*—not reducible to neurobiological states without residue. It is natural that those who interpret psi results favorably are also motivated to accept (or to create) non-local theories of consciousness. Moreover, while advocates of Anomalous and Altered States theories skew toward dualist or idealist theories, they espouse all the non-materialist theories: quantum, panpsychism and monism as well as dualism and idealism. For example, Dean Radin supports a "quantum oriented," non-substance dualism (17.3), while Charles Tart supports an "emergent interactionism" substance dualism (17.4). All the theories that follow are motivated, at least in significant part, by anomalous, psi or paranormal phenomena (often NDEs and OBEs).

17.1. Bergson's multiplicity, duration, perception, memory

Late 19th/early 20th century philosopher Henri Bergson's nonreductive consciousness is an unapologetic, sophisticated challenge to Materialism Theories. In consciousness, he says, "we find succeeding states without distinction; and, in space, simultaneities which, without succeeding, are distinguished, in the sense that one is no longer there when the other one appears. Outside of us, reciprocal exteriority without succession: within, succession without reciprocal exteriority" (Bergson, 1889; Pascal, 2023).

Bergson's consciousness, which "retains the past and anticipates the future," is not easy to categorize. It is the complex centerpiece of his grand philosophical system that highlights several original concepts: multiplicity (heterogeneity and continuity, the immediate data of consciousness); duration (no juxtaposition of events, no mechanistic causality, a qualitative multiplicity); perception (pure, images are all we sense); memory (pure, personal)—each from Bergson's idiosyncratic perspective (Lawlor and Moulard-Leonard, 2021).

Bergson self-characterizes his own view as "frankly dualist," because it "affirms both the reality of matter and the reality of spirit," though he recognizes (and thinks he can overcome) "the theoretical difficulties which have always beset dualism." Bergson rejects that "matter is a thing that possesses a hidden power able to produce representations in us. There is no hidden power in matter; matter is only images." He critiques materialism by "showing that matter does not differ in nature from representation … the image is less than a thing but more than a representation" Moreover, Bergson's theory of "pure perception" posits that how we know things, in their pure states, is representational, thus establishing a middle ground between realism and idealism (Lawlor and Moulard-Leonard, 2021).

To Bergson, "That which perceives is consciousness, that is to say *the*

[59] A type I error (false positive) occurs when a null hypothesis is rejected even though it is actually true in the population.

[60] Upon reviewing an early draft of this paper, cognitive scientist/parapsychologist Edward Kelly said (after some pleasant words which shall remain private), "I think you and Jonathan Schooler both substantially underestimate the cumulative force of the evidence for psi processes."

memory taken as a whole because this consciousness, which we might call here human soul or human spirit, is a *continuous movement* between pure perception and pure memory." "The brain does not perceive: it *transmits* perception (pure or not) from the organ of perception to consciousness (*sensory* mechanism) and, conversely, it *transmits* the nascent order of action from consciousness to the appropriate motor organ to act in response to perception (*motor* mechanism) (Bergson, 1896, 1990; Pascal, 2023).

Continuing, Bergson puts memory at the heart of consciousness with pithy propositions. "Mind with memory is consciousness and produces time. Mind without memory is the unconscious and produces space." "The phenomena of memory are at the juncture of consciousness and matter." "Going from pure perception to memory, we definitively leave matter behind for the mind." "First the present becomes past and *then* the past becomes present. Thus, consciousness becomes *the bridge* between the present and the past which we call *the future*. The future is being fabricated at all times by a *free* act called choice of consciousness" (Bergson, 1896, 1990; Pascal, 2023).

Bergson has consciousness as "unquestionably connected with the brain: but it by no means follows that a brain is indispensable to consciousness." The brain, he says, is not the generator of consciousness, but a "filter" of consciousness, because unfiltered consciousness would be shattering and stupefying. Our capacity to focus and act in the world is enabled by our brain acting as barrier, shielding our personal awareness from the vast cacophony swirling in the great beyond (Bergson, 1920).

Bergson's notion of consciousness is "a ceaselessly dynamic, inherently temporal substance of reality" that might even allow for some sort of survival after death (Barnard, 2011). Is Bergson a kind of dualist, panpsychist or even idealist? No matter. Certainly, he is no materialist. He was president of the Society for Psychical Research, which no doubt reflects his views and warrants his inclusion in this category.

According to Alex Gomez-Marin, "The essential debate about the precise relationship between thoughts and brains (solidarity versus equivalence, participation versus interaction, etc.) has faded. But one can revisit Henri Bergson to find a lucid dose of common sense: 'That there is a close connection between a state of consciousness and the brain we do not dispute. But there is also a close connection between a coat and the nail on which it hangs, for, if the nail is pulled out, the coat falls to the ground. Shall we say, then, that the shape of the nail gives us the shape of the coat, or in any way corresponds to it?' What do brain data really show? The edifice of twenty-first-century consciousness neuroscience stands on the foundations of the following candid empirical fact: 'change the brain, experience changes.' The hard problem of wardrobes is to explain why and how hangers give rise to clothes" (Gomez-Marin, 2022).

Moreover, Gomez-Marin and Juan Arnau retrieve an argument by Bergson to expose, what they call "the fundamental self-contradiction of parallelism: it forces the idealist to sustain that 'the part is the whole', and the realist that 'the part subsists when the remainder of the whole vanishes.'" Bergson's image-movement theory (from *Matter and* Memory) is then recast "to overcome the conceptual dead-end of parallelism"—the point being that "Consciousness is real. So is its special relation to the brain. Differentiating between solidarity (as lesions demonstrate) and equivalence (as no data does) offers an alternative point of departure for an understanding of consciousness that does not, from the outset, outlay a false problem" (Gomez-Marin and Arnau, 2019).

17.2. Jung's collective unconscious and synchronicity

Psychiatrist/psychoanalyst Carl Jung famously posits a "collective unconscious," a hidden, quasi-nonphysical aspect of reality with which each individual human subconsciousness is in some sense connected. Prime features of the collective unconscious, according to Jung, are "archetypes" and "synchronicity:" archetypes are ancient primal symbols, themes and images that are apparently universal and recurring and can impact individual psyches; and synchronicity describes putative connections between physical and/or mental events that are acausal and seemingly random but appear to be meaningfully related.

Synchronicity is properly controversial, because, according to the laws of physics, there should be nothing of the sort. But if, perchance, synchronicity does exist and it does represent real phenomena—if synchronous events are not mere chance masquerading as meaning—then synchronicity would be a powerful probe of novel fundamental realities of mind and world, and it would, en passant, take down classic materialism.[61]

Jung had been intrigued by the ancient Chinese oracle *I Ching*, whose 64 hexagram symbols generated divinations "made by seemingly random numerical happenings for which the *I Ching* text gives detailed situational analysis." Years later, Jung introduced synchronicity "to describe circumstances that appear meaningfully related yet lack a causal connection." Other definitions Jung used enriched synchronicity's non-normal vision of reality: "a hypothetical factor equal in rank to causality as a principle of explanation," "an acausal connecting principle," "acausal parallelism," and the "meaningful coincidence of two or more events where something other than the probability of chance is involved" (Synchronicity, 2023).

Collaborating with physicist and Nobel laureate Wolfgang Pauli (Pauli Exclusion Principle), Jung further developed the radical concept. Pauli contributed his intimate understanding of the common sense-defying elements of quantum theory, such as complementarity, nonlocality, and the observer effect, and their work together yielded what is now called the "Pauli–Jung conjecture"—which stands for "a basic psychophysically neutral reality with its derivative mental and physical aspects and the nature of the correlations that connect these aspects." Jung and Pauli "offered the radical and brilliant idea that the currency of these [synchronicity's] correlations is not (quantitative) statistics, as in quantum physics, but (qualitative) meaning" (Atmanspacher, 2020b; Atmanspacher and Fuchs, 2014).

For his part, Pauli said that synchronicities were "corrections to chance fluctuations by meaningful and purposeful coincidences of causally unconnected events," though he sought to move away from "coincidence" and towards a "correspondence," "connection," or "constellation" of discrete factors. Jung's and Pauli's position was that, "just as causal connections can provide a meaningful understanding of the psyche and the world, so too may acausal connections" (Synchronicity, 2023).

The speculative nexus between synchronicity and quantum physics turns on entanglement, where there is absolute correlation but absolutely no transference of information. Thus, quantum entanglement is said to be the physical phenomenon that most closely represents the concept of synchronicity. As Harald Atmanspacher puts it. "Inspired by and analogous to entanglement-induced nonlocal correlations in quantum physics, mind-matter entanglement is conceived as the hypothetical origin of mind-matter correlations. This exhibits the highly speculative picture of a fundamentally holistic, psychophysically neutral level of reality from which correlated mental and material domains emerge" (Atmanspacher, 2020a).

Atmanspacher probes for epistemic/ontic commonalities between synchronicity and entanglement. He highlights "local realism" of empirical facts obtained from classical measuring instruments and a "holistic realism" of entangled systems, arguing that "these domains are connected by the process of measurement, thus far conceived as independent of conscious observers. The corresponding picture on the mental side refers to a distinction between conscious and unconscious domains" (Atmanspacher, 2020a).

A further claim concerns Jung's "depth psychology" conceptions, where these two domains of local realism and holistic realism are

[61] I was introduced to synchronicity by Arthur Koestler's 1972 book, *The Roots of Coincidence*.

connected by the emergence of conscious mental states from the unconscious, analogous apparently to physical measurement. Crucially, famously, "Jung's unconscious has a collective component, unseparated between individuals and populated by so-called archetypes." These archetypes are said to be "constituting the psychophysically neutral level comprising both the collective unconscious and the holistic reality of quantum theory." At the same time, Atmanspacher says, "they operate as 'ordering factors', being responsible for the arrangement of their psychical and physical manifestations in the epistemically distinguished domains of mind and matter" (Atmanspacher, 2020a).

So, here's the axial question: Does the "acausal connection principle" in synchronicity meaningfully parallel the "acausal correlation principle" in quantum entanglement? Is this apparent parallelism revelatory or shoehorn forced, unveiling profound new realities, or overthinking superficial similarities? Again, the axial question.

Why have I situated Jung's collective unconscious on this Landscape of Consciousness? The reason is somewhat indirect, because, if valid as stated, a literal collective unconscious would falsify many theories of consciousness, certainly defeat every strictly materialistic theory. Moreover, it would be consistent with diverse nonphysical theories: Dualism, Panpsychism, and Idealism. Idealism is most often associated with Jung's worldview.

While Jung is recognized as one of the most important psychologists in history, few scientists take his concept of the collective unconscious as literally true. However, Jung's highlighting (and coining) synchronicity does elicit from time to time far-reaching theories in both physics and consciousness regarding anomalous cognition and events.

17.3. Radin's challenge to materialism

Coming at consciousness from an empirical point of view, parapsychologist Dean Radin calls on what he believes to be the overwhelming evidence for psi phenomena in order to infer that "intention affects the physical world." He characterizes his work as "a tiny part of a century-long legacy of researchers who have reported studies, when meta-analyzed, provide strong evidence for psi" (Radin, 2007).

Radin notes that non-local conscious experiences are commonly reported (prevalence rates well above 10% and as high as 90%). Moreover, cognitive abilities can be retained when the brain is seriously compromised. For example, in terminal lucidity patients with terminal neurodegenerative conditions can display apparently normal cognitive function and mental clarity during the short period preceding death; paradoxical lucidity can occur in dementia due to advanced Alzheimer's disease, brain abscesses, tumors, strokes, and meningitis.[62]

Radin recruits the happy term "magic," as in "real magic," to facilitate public appreciation that psi/paranormal phenomena are a natural aspect of reality (Radin, 2018), and he claims strong experimental or empirical evidence for three types of "real magic:" (i) "divination," which in today's world is perceiving through space and time and which is identical to clairvoyance, remote viewing, precognition; (ii) "force of will," which causes "psycho-kinetic effects," the idea that your mindful intention can affect aspects of the physical world beyond yourself; and (iii) "theurgy," by which Radin means the practice of engaging or communicating with spirits, entities that are not human and invisible to most people (Radin, 2022).

Then, Radin says, you start thinking like a scientist and ask how could these phenomena happen? "Well, what are the 'force beams' coming out of the head? But we don't see any beams coming out. In fact, even the evidence doesn't exactly look like it's a causal mechanism. These are weird relationships that arise." Next, Radin says, is to consider some kind of "downward causation" effect. I suppose that's possible, he says, "but it just seems to make more sense if really at the bottom is simply consciousness. There's some kind of 'ocean of consciousness' that gives rise to an emergent property, which we may call energy, which gives rise to matter, and then the physical world plays out in a way that we usually see it, except that really at the bottom is consciousness." It's much, much easier, Radin says, "to simply imagine that matter is ultimately composed of mind, that mind and matter are ultimately the same thing, than to imagine the complex mechanisms of mind-body/brain interactions" (Radin, 2007).

Radin and colleagues point to specific non-local effects to support their proposal that "post-materialistic models of consciousness may be required to break the conceptual impasse presented by the hard problem of consciousness." They review several alternative non-physicalist theories: all of which purport to refute the central premise of physicalist theories that consciousness is generated solely and purely by the brain and is only local to the brain. Most of these theories have quantum or panpsychism pedigrees; some even propose that consciousness is more fundamental than energy-matter and spacetime (Wahbeh et al., 2022).

Radin and colleagues propose that "consciousness may not originate in the brain," although many aspects of human consciousness are obviously dependent on the brain. They also suggest that awareness too extends beyond the brain. While they affirm with conviction that these non-physical, non-local properties of consciousness are observable, they are less confident as to the underlying mechanism of how they work. It may be, they say "due to a non-local material effect, to consciousness being fundamental, or something else we have not yet discovered" (Wahbeh et al., 2022).

Thus, Radin and colleagues propose "specific phenomena that we would expect to see if non-local consciousness theories are correct:" Perceiving information about distant locations (clairvoyance, including remote viewing); perceiving information from another person (telepathy); perceiving the future (precognition); and apparent cognitive abilities beyond the experience/learning/skill of the person exhibiting them (e.g., speaking a foreign language they do not know, i.e., speaking "in tongues") (Wahbeh et al., 2022).

In defending their quantum-oriented approach to the mind-brain problem, Stuart Kauffman and Radin cite as evidence for a nonlocal mind the predictions of two types of nonlocal experiences: "The mind would have the capacity to extend beyond the mind-brain system, and the act of observing a distant physical system would, to some degree, directly influence the behavior of that system." Such effects, they claim, would occasionally result in experiences "where minds interact with other minds, where minds perceive hidden or distant objects or events, and where minds directly influence aspects of the physical world" (Kauffman and Radin, 2020).

The common terms for these psi phenomena are the following: "*telepathy* for mind-to-mind interactions; *clairvoyance* for perceptions of inanimate things across space; *precognition* for perceptions through time; and *psychokinesis* for mental influence of physical objects." Kauffman and Radin stress that use of these different terms does not imply that the underlying phenomena are different in kind; "they are just labels used to describe the way the experiences seem to manifest" (Kauffman and Radin, 2020).

While Radin's primary line of argument uses psi phenomena to corroborate a nonlocal mind of a quantum-oriented nature, one can reverse the causal-explanatory direction such that a nonlocal mind could provide a mechanism for psi phenomena (Kauffman and Radin, 2020). (Note that the arrow of causation or explanation can point in either

[62] In the last two or so years of her life, due to advanced dementia, my mother, Lee Kuhn (née Lena Kahn), who died at 102, formerly a vibrant personality, did not speak at all. However, on four or five occasions, she would suddenly blurt out, in loud and confident voice, complete, articulate, sharply formed sentences. To me, while I was working intensely on my computer: "With all that junk you're doing on that machine, at least are you making any money?" To the caregivers: "It's not that I can't talk. It's that I don't want to talk to you!" (My mother was always, well, feisty). It did not occur to me that this behavior, however startling, could support theories of consciousness that are not brain-bound. While geriatric neurology has ample resources to explain such phenomena naturally, I suppose it could also align with nonlocal theories.

direction, although not in both directions in the same argument, which would be circular.)

17.4. Tart's emergent interactionism

Consciousness explorer Charles Tart proposes "Emergent Interactionism" as a dualistic theory of consciousness, based on his long work on altered states of consciousness, transpersonal psychology, and multiple forms of parapsychology (Tart, 1978a, 2007). He calls it "pragmatic dualism," in that it reflects the nature of things and recognizes the need to understand consciousness in terms of two qualitatively different aspects of reality: a "B system" of brain and body governed by physical law, and a "M/L system" of the mental and life aspects of reality.

Consciousness, Tart says, is a "system property," an emergent from the auto-psi interaction of the B and M/L systems. Ultimate understanding of consciousness, then, in addition to conventional neuroscience, also requires increasing knowledge of psi/paranormal phenomena.

Tart claims that the veracity of psi phenomena is a clear-cut scientific demonstration of the inadequacy of a materialistic view of mind and matter. The "psychoneural identity hypothesis," he says, is so widely accepted in science and so thoroughly discredited by ESP and parapsychology (Tart, 1978a).

Tart's extraordinary hypothesis is that psi is being used much of the time in everyone's life, but it is being used *internally*. This means, he offers, we frequently use auto-clairvoyance to read our own B system and auto-psychokinesis to affect our B systems. This is ordinary psi, auto-psi. What we observe in parapsychological experiments, however, is non-ordinary psi, which is taking a process ordinarily confined within a single organism and pushing it outside, making it "allo-psi" (Tart, 1978a, personal communication).

The Emergent Interactionist position allows for kinds of potential survival beyond bodily death, Tart speculates, but it would not necessarily be the kind of postmortem survival we usually conceive of. Our usual imagery of survival means survival of the basic pattern of our consciousness, our experience of our mental life, our feelings of personal identity. But if consciousness, as Tart proposes, is an emergent of the auto-psi interactions of the B and the M/L systems, an emergent of constant patterning of each system upon the other, then if the B system ceases functioning in death, the patterning influence of the B system upon the M/L system will cease, so how is ordinary consciousness, as we know it, to survive? What is the emergent to emerge from?

One answer, according to Tart—and not the pleasant answer people would like—may be that personal identity, which is so intimately intertwined with ordinary consciousness, does not survive death, at least not for very long, and in any event it would likely be quite different from the original person (Tart, 1978a).

Moreover, Tart stresses, psi phenomena radicalize even further the nonphysical dimension of dualism by showing how consciousness reveals or enables space and time to be flexible and mobile. He proposes that an extended aspect of the mind, which is activated when psi abilities are used, has two properties that differ from our ordinary consciousness. The first is that psi-engaged consciousness is not spatially or temporally localized with respect to ordinary spatial and temporal constraints on the physical body/brain, and so somehow can pick up information at spatial locations outside the sensory range of the body/brain (Tart, 1978b).

The second property of psi-engaged consciousness is that the center point of its experienced present can be located at a different temporal location than the center point of the experienced present of ordinary consciousness. That is, it may be centered around a time that, by ordinary standards, is past or future. Furthermore, the duration of this extended dimension of the mind's experienced present is wider than that of our ordinarily experienced present, such that the mind may include portions of time that, from our ordinary point of view, are both past and future as well as present (Tart, 1978a).

17.5. Josephson's psi-informed models

Nobel laureate physicist Brian Josephson approaches consciousness from the dual perspectives of fundamental science and psi phenomena. He posits understanding the brain by "implementing the demands of an appropriate collection of models, each concerned with some aspect of brain and behaviour"—in particular, explaining "higher-level properties [e.g., phenomenology] in terms of lower-level ones by means of a series of inferences based on these models" (Josephson, 2004).

Josephson says that many scientists believe that psi is real but don't come out and say so due to social pressures and career concerns. He considers the immense implications if, say, telepathy exists. "All sorts of things would change if we accepted that paranormal things happen and that we have such connections." One simple example is playing music in an ensemble, where, using telepathy, "they somehow lock into a single state and perform better" (Josephson, 2012a).

As for how psi could work, Josephson posits quantum physics—Einstein's "spooky actions at a distance"—but also recognizes that "we probably need to include new dimensions of reality." He points to biology, the emergence of life, as a "strange phenomenon" that "changes the whole game." Biology, he says, "involves principles that we don't have in physics, and these principles might be able to unfold in quite dramatic ways, extending our understanding of the cosmos, perhaps because biological principles lead to minds and minds can do things."

Josephson sees biology and consciousness as fundamentally linked because "organisms deal with information in a certain way and consciousness could fit into that." There could be some kind of "biological field," analogous to the electric field, he says. The assumption that you can get to some ultimate level, though, "may be incorrect."

Josephson's "theory of everything" paradigm, informed by psi and based on "parallels between spontaneously fluctuating equilibrium states and life processes," envisions "an evolving ensemble of experts [modules], each with its own goals but nevertheless acting in harmony with each other." How such an ensemble might function and evolve, he says, can affect fundamental physics such as symmetry and symmetry breaking. Josephson says, "This picture differs from that of regular physics in that goal-directedness has an important role to play, contrasting with that of the conventional view which implies a meaningless universe" (Josephson, 2021).

Moreover, advancing John Wheeler's proposal that "repeated acts of observation give rise to the reality that we observe," Josephson suggests that "nature has a deep technological aspect that evolves as a result of selection processes that act upon observers making use of the technologies." He concludes that "our universe is the product of agencies that use these evolved technologies to suit particular purposes" (Josephson, 2015). Going for ultimates, Josephson proposes that "something is happening behind the universe on a larger, possibly infinite scale, that has this organization and is doing things—like bringing a universe into being, setting up its laws, and perhaps directing its evolution" (Josephson, 2012b).

17.6. Wilber's Integral Theory

Charismatic, iconoclastic philosopher Ken Wilber puts forth "Integral Theory" as an overarching metatheory that seeks to harmonize numerous (100+), diverse philosophical and spiritual theories—including consciousness studies, meditative traditions, religious traditions, psychology, transpersonal psychology, parapsychology and sociology—into a single, coherent framework that accounts for the human condition, broadly conceived. Integral Theory is founded on a developmental "spectrum of consciousness," an evolutionary account from ancient non-life-to-life proto-consciousness to ultimate spirit/spiritual attainment or enlightenment. In New-Age intellectual circles, Integral Theory is lauded as a pioneering, path-setting model for novel explorations of consciousness and human futures (Section: Integral Theory/WIlber, 2024).

Wilber's core framework is a four-quadrant model—the AQAL (All Quadrants All Levels) model—the simple-sounding 2x2 grid arraying interior-exterior with individual-collective. The ambitious claim is that all essential theories, models and levels of individual psychology and spiritual development, and of collective expressions of social organization, can be subsumed and discerned within Wilber's AQAL system. Moreover, according to its proponents, all forms of knowledge and experience can be conceptualized as fitting and flowing together within the model.

In his 1995 classic, *Sex, Ecology, Spirituality: The Spirit of Evolution,* Wilber combines sex and gender issues, ecological wisdom, and non-sectarian spirituality into what adherents see as a prescient, coherent vision for contemporary times. Founded on the emergence of mind and the evolution of human consciousness, and on combatting philosophical naturalism (which he considers as a source of the world's ills), Wilber asks a critical question: Can spiritual concerns be integrated with the modern world? Wilber conceives of the "Kosmos" (not "cosmos," which is too physicalist for him) as consisting of several concentric spheres: matter (the physical universe); then life (the vital realm); then mind (the mental realm); then soul (the psychic realm); and then finally Spirit (the spiritual realm) (Wilber, 1995).

In his 1999 book, *Integral Psychology: Consciousness, Spirit, Psychology, Therapy*, Wilber seeks to reestablish spiritual consciousness in contemporary developmental psychology by embracing "every legitimate aspect of human consciousness [Eastern and Western, ancient and modern] under one roof." Wilber's project is to legitimatize, within the framework of modern science, the spiritual quest (Wilber, 1999).

What's the relationship between Wilber's project and this Landscape of theories of (phenomenal) consciousness? It is direct in that if Wilber succeeds, Materialism Theories of consciousness are obviously undermined and likely defeated. Although Wilber does not get much into the consciousness-categories game, his core developmental process begins with a separation of individual consciousness from a transcendental reality, and then his grand course of human development moves toward restoring the primordial unity of human and transcendental consciousness (Integral Theory/WIlber, 2024).

17.7. Combs's chaotic attractor and autopoietic systems

Consciousness researcher and systems theorist Allan Combs uses nonlinear dynamics, and more specifically chaos theory, to understand how all the elements of conscious experience "cling together to form the many states and structures of consciousness that characterize the onflow of our experiential lives." (Section: Combs, 2022). In doing so, Combs channels William James, "This multitude of ideas, existing absolutely, yet clinging together, and weaving an endless carpet of themselves, … like dominoes in ceaseless change, or the bits of glass in a kaleidoscope—whence do they get their fantastic laws of clinging, and why do they cling in just the shapes they do?" (James, 1890).

"We live in a nonlinear universe," Combs says, which means that "nothing turns out exactly as one might expect based on projections from the past." While this is true in physics and astronomy, it is "even more true in the realms of biological systems and the mind." What results is "the emergence of novel interacting elements," which is "an essential feature of countless real-world events." Moreover, in chaotic systems, like the weather, while there are recognizable general patterns, "it is impossible to make precise predictions about future behavior"—local or moment-to-moment details are always unpredictable.

The action of chaotic systems can be mapped topologically as *attractors*, that is, as recognizable mathematical patterns that repeat or almost repeat themselves indefinitely. But systems that can be represented as chaotic attractors never repeat themselves precisely. "Many complex systems of a biological nature, such as the metabolic rhythms of a living cell, EEG responses to sensory stimuli, and circadian sleep cycles, are in a strict sense always novel. That is, they are never exactly the same twice." Even the action of a healthy human heart shows variation from beat to beat (Combs, 2022).

According to Combs, consciousness, the onflow of experience, "fits the bill nicely as a chaotic-like attractor." To begin with, it is always in motion, dynamic and ever-changing. Moreover, like all chaotic attractors, it displays a recognizable pattern; yet, it is never exactly the same during different cycles. Indeed, this unique feature of each person's onflow of experience is what James considered to be the basic signature of an individual personality. "Each of us, for instance, experiences unique patterns of thoughts, feelings, perceptions, memories, and so on, that replay in roughly the same way day in and day out." But never precisely the same. Thus, consciousness as a chaotic attractor is ever-changing yet identifiable, "in a fashion that amounts to a distinct signature of the individual's experiential life."

Combs recruits the concept of "autopoiesis" to help explain consciousness. Autopoiesis means capable of generating and maintaining itself by producing its own parts—"auto" meaning "self" and "poiesis" meaning "creation" or "production" (Humberto and Varela, 1980)—a concept applied widely in understanding biological systems, such as the self-maintaining biochemistry of living cells.

Assuming consciousness, as James had it, is "the onflow of thoughts, memories, and emotions that recreate themselves as they go along, 'clinging together, and weaving an endless carpet of themselves' … [then] this description fits the notion of a chaotic autopoietic attractor." For example, Combs cites how "joy, anger, and sadness tend to sustain themselves by creating their own self-perpetuating internal conditions." Emotional states self-propagate, he says, "thereby creating coherent self-organizing streams of experience," with each such state accompanied by its own neurochemistry, which also contributes to its resilience (Combs, 2022).

In addition, cognitive patterns by which we understand the world exemplify the mind as a complex, self-creating autopoietic system. The mind also exhibits features of a chaotic system on the "edge of chaos" or "the brink of change," characterized by "periods of relative stability punctuated by phases of instability, or increased chaotic behavior, after which they may return to their original state, or transition (bifurcate) to a new attractor pattern" (Combs, 2022).

17.8. Schooler's resonance theory and subjective time

Experimental psychologist Jonathan Schooler outlines a theory of consciousness that combines two novel ideas: "resonance theory," where multiple levels of consciousness interact, and "subjective time," where consciousness arises with an observer's movement through objective time relative to a currently unacknowledged dimension of subjective time (Schooler, 2022a). Both ideas are motivated by Schooler's research and thinking on meta-consciousness, mind wandering, and anomalous cognition (i.e., psi/paranormal phenomena).

The first idea is what he calls meta-consciousness or meta-awareness. In addition to having experiences, he says, "periodically, I check-in on what's going on in my mind. And I may notice things that I hadn't noticed otherwise; for example, mind wandering while reading. We all have the experience of reading along and suddenly realizing that, although our eyes are moving across the page, we have no idea what we're reading. We're thinking about something completely unrelated. It's as if we're waking up, but we were awake all along" (Schooler, 2022a). Temporal dissociations are revealed when an individual, who previously lacked meta-consciousness about the contents of consciousness, directs meta-consciousness towards those contents (e.g., catching one's mind wandering during reading) (Schooler, 2002).

Appreciating the distinction between consciousness and meta-consciousness helps to clarify a variety of phenomenal experiences. As Schooler notes, "when we're entering a moment of meta-consciousness, when we recognize that we can have experience without being meta-aware of that experience, it helps to open up the discussion about consciousness. We can have an emotion and not realize that we're having it. We may not notice that we're angry. When people shout, 'I'm not angry,'

they are attempting to take stock of it, but they get it wrong. By recognizing this distinction between experiential consciousness and meta-consciousness we can gain broader perspectives on the varieties of consciousness and deeper understanding of the nature of consciousness" (Schooler, 2022a).

Meta-consciousness is said to correspond to conscious states in which the content of those states includes an explicit characterization of what is currently being experienced. In other words, he says, meta-consciousness is simply a kind of conscious experience in which the focus of thought is turned on to itself. Thus, although conscious and unconscious mental processes are categorically distinct, conscious and meta-conscious states differ only with respect to the type of content that they entail (Schooler and Mrazek, 2015).

"Resonance theory" leverages meta-consciousness by positing multiple levels or streams of consciousness going on simultaneously. In the same way that the brain's left and right hemispheres seem to carry on multiple streams of consciousness, Schooler says it's possible that lower levels or "windows" may have their own, albeit circumscribed conscious experiences. And the way that these windows are communicating with one another is through resonances of assorted kinds. Within a single window, all can be happening in synchrony, and then, between levels, there is cross-frequency coupling. And it is through these various kinds of resonances, both top-down and bottom-up circuits, that multiple potentially sentient windows may be able to communicate with one another, thus producing what we know as macroscopic consciousness (Schooler, 2022a).

According to Schooler, the resonance theory of consciousness works via a shared resonance that allows different parts of the brain to achieve a phase transition in the speed and bandwidth of information flows between the constituent parts. This phase transition allows for richer varieties of consciousness to arise, with the character and content of that consciousness in each moment determined by the particular set of constituent neurons (Hunt and Schooler, 2019).

Schooler recognizes that because the idea driving his resonance theory is that we may have multiple levels of consciousness, he affirms what Daniel Dennett denies: a "Cartesian Theater" in the brain. Whereas Dennett disparages the "Cartesian Theater" as imaginary, Schooler champions its reality.

"I do think that, at any given moment, there is a vantage," Schooler states, "but I also think that it's just one of multiple vantages that are happening in the mind. We have multiple windows; we have what we call 'nested observer windows'. And so, we imagine that consciousness may actually be these nested windows, windows upon windows, with each one resonating with the others. In this way, through the shared resonance between different windows, at different levels of awareness, we may construct an ever increasingly complex conscious experience." Thus, Schooler conjectures that there may be not just a single Cartesian Theater, but in fact a "Cartesian Multiplex" of multiple nested observers (Schooler, 2022a).

The second idea undergirding Schooler's theory of consciousness is the real possibility of "anomalous cognition" (i.e., psi/paranormal phenomena). "I have a motto," he says, "'entertaining without endorsing', meaning I see sufficient evidence such that psi phenomena deserve consideration—hundreds of studies that have found positive results. But at the same time, the failures to replicate, and the profound challenges in understanding how it could exist, if it does exist, lead me to feel that we are far from being able to endorse it as being a real phenomenon" (Schooler, 2022b; Schooler et al., 2018).

For example, although accounts of precognition (i.e., the mind perceiving events that have not yet occurred) have been prevalent across human history, Schooler and colleagues say it is no surprise that these claims have been met with strong skepticism, but rather than dismissing the claims, they call for more research to bridge the gap between skeptics and proponents (Franklin et al., 2014).

While scientists on both sides may usefully vary in the criteria that they set for entertaining and endorsing anomalous cognition, Schooler and colleagues argue that researchers should consider adopting a liberal criterion for entertaining anomalous cognition while maintaining a very strict criterion for the outright endorsement of its existence. Appreciating the justifiability of polar opposite views on psi/paranormal phenomena, Schooler encourage humility on both the part of those who present evidence in support of anomalous cognition and those who dispute the merit of its investigation (Schooler et al., 2018).

Schooler wonders whether there may be some aspects of existence that may forever elude full scientific scrutiny. He relates two germane examples. "Just as it may never be possible to prove objectively the single thing we know the best, which is our subjective experience of qualia, so it may never be possible to reproduce anomalous cognition events with robust precision and effects" (Schooler, 2022b).

Seeking potential mechanisms for anomalous cognition or psi/paranormal phenomena, if they were to exist, Schooler speculates that explanations of consciousness and explanations of anomalous cognition are going to be related. "If there is anything to anomalous cognition," he says, "then it has to do with unexplained aspects of the nature of consciousness itself" (Schooler, 2022c).

Pondering what possible structures could explain both consciousness and anomalous cognition, Schooler focuses on the failure of the prevailing third-person perspective of material reductionism to account adequately for the first-person experience of subjectivity, the flow of time, and the present. While acknowledging intrinsic differences among these three ideas, he posits a meta-perspective that experience, the flow of time, and the unique quality of "now" might be accommodated by a subjective dimension or dimensions of time (Schooler, 2014). This new dimension of existence, a subjective dimension of time, would be as real as spatial dimensions. It is this subjective dimension, Schooler posits, that, while entirely overlooked by science, may be where the possible realm of anomalous cognition resides as well as being an essential part of the deep explanation of consciousness (Schooler, 2022b).

Alluding to information theory, Schooler considers how a conjoined first-person/third-person meta-perspective could conceptualize subjectivity, the present, and the flow of time within an architecture that closely links information to an ever-changing now. Thus, "*consciousness arises via the changing informational states associated with an observer's movement through objective time relative to a currently unacknowledged dimension or dimensions of subjective time" (*Schooler, 2014).

Perhaps most dramatically, certainly most controversially, the existence of an additional temporal dimension could be consistent with precognition (knowing the future), which has a vast anecdotal tradition and a serious (if challenged) research program. Schooler asserts that "demonstrating robust findings of precognition could inform theories of how consciousness interfaces with time in a manner not currently considered in modern science" (Schooler, 2014).

Given his "resonance theory" and "subjective dimension of time," what is Schooler's ultimate ontology of consciousness? Wielding his motto, "entertaining without endorsing," he picks out panpsychism. "The magnitude of the challenge of how consciousness exists in physical reality, he says, invites ambitious characterizations of how it might fit. And panpsychism, the idea that very low-level consciousnesses integrate into higher levels, seems quite plausible" (Schooler, 2022a).

17.9. Sheldrake's morphic fields

Parapsychologist Rupert Sheldrake proposes "morphic fields" as a field of form or shape or organization, "such that every entity has its own field: each ant colony, each termite nest, a flock of birds, a pack of wolves and a herd of animals." Social groups of people too, such as a family, a tribe or a group, where "members of that group interact with each other within that [morphic] field. When they go apart, that field, as it were, stretches. It doesn't break. The members remain connected at a distance in a way analogous to quantum entanglement." There is a huge diversity of morphic fields. "Each self-organizing pattern of activity has its own morphic field, and a kind of collective, inherent memory"

(Sheldrake, 2007a, n.d.a, n.d.b).

Morphic fields at all levels of complexity have the following characteristics: They are self-organizing wholes; they have both a spatial and a temporal aspect, and organize spatio-temporal patterns of vibratory or rhythmic activity; they attract the systems under their influence towards characteristic forms and patterns of activity; they are a nested hierarchy or holarchy; they are structures of probability, and their organizing activity is probabilistic; and they contain a built-in memory that is cumulative and reinforcing (Sheldrake, n.d.b).

Sheldrake's corollary concept of "morphic resonance" expresses this kind of collective memory inherent in nature, the inference of similar prior patterns of activity on subsequent similar patterns of activity—which, once they have occurred, can happen more easily anywhere. Morphic resonance is rhythmic in nature, patterns of vibration in space and time that give rise to this kind of memory. It is like a habit, he says, which depends on memory, usually unconscious memory.

Sheldrake posits that morphogenesis in biology depends on organizing fields. As the case in point, the fields organizing the activity of the nervous system are inherited "through morphic resonance, conveying a collective, instinctive memory. Each individual both draws upon and contributes to the collective memory of the species. This means that new patterns of behavior can spread more rapidly than would otherwise be possible."

Unabashedly controversial and mainstream rejected, morphic fields, Sheldrake says, underlie our mental activity and our perceptions. He claims that the existence of these fields can be tested experimentally, such as the sense of being stared at (a claim refuted by in-field scientists.) He further claims that morphic fields of social groups "help provide an explanation for telepathy" and that "telepathy seems to be a normal means of animal communication" (as with dogs [Sheldrake, 2011])—all of which are mainstream dismissed.

Sheldrake argues that "telepathy is normal not paranormal, natural not supernatural, and is also common between people, especially people who know each other well," adding, "The morphic fields of mental activity are not confined to the insides of our heads. They extend far beyond our brain through intention and attention"[63] (Sheldrake, n.d.a, n.d.b).

17.10. Grinberg's syntergic/neuronal field theory

Iconoclastic neurophysiologist Jacobo Grinberg-Zylberbaum presents a psychophysiological theory of consciousness—"The syntergic theory"— which postulates that "the human brain is able to create a hypercomplex field of interactions that are the result of the activation of all its neuronal elements." He calls this interaction matrix the "neuronal field," and "one of the effects of its activation is the unification of neuronal activity." Grinberg speculates that "the neuronal field produces a distortion in the basic space-time structure and the reality of our percepts is the perception of this distortion." For the neuronal field to be activated, he says, "a structure as complex as the brain is needed" and "this field is responsible for the interactions between brains produced in emphatic non-verbal communication." Consciousness, he states, "is closely connected to the neuronal field" (Grinberg-Zylberbaum, 1997).

Grinberg, who pursued fringe areas, such as shamanism, and who vanished mysteriously at age 48, conceives of "Reality" as "an undifferentiated energetic matrix" and "by means of the brain, this matrix is converted into neuronal activity and experience." Thus, "human experience is considered to constitute or 'exists in' a dimension different from that which is related to the localized physiological activity of the brain." Combining "cerebral electrochemical changes and the experiences themselves of light, sound, love, fear, etc., energetic transformations of a qualitative nature must take place." These hypothesized transformations engender Grinberg's "syntergic theory" which, he says, concerns "the creation of experience" (Grinberg-Zylberbaum, 1981). Grinberg also claims to support "the brain's quantum nature at the macrolevel" by demonstrating "transferred [evoked] potentials" between electrically insulated subjects situated 14.5 m apart (Grinberg-Zylberbaum et al., 1994).

Moreover, the syntergic theory postulates that the brain's energetic field (the neuronal field) "expands into space, interacts with the space-matter continuum, is able to change the informational content of the latter, and thus affects other neuronal fields and physical forces." According to this theory, he says, "gravitation is a by-product of an alteration in the informational content of the space-matter continuum, and human communication is based on neuronal field interactions." In short, the syntergic theory considers experience as "the interaction between the neuronal field and the energetic (syntergic) organization of space." Grinberg claims that "this approach is the one that contemporary physics requires in order to be able to incorporate experience into its realm and thus expand its limits to include life and consciousness" (Grinberg-Zylberbaum, 1982).

17.11. Graboi's three-aspect model

Cognitive neuroscientist Daniel Graboi, motivated by telepathy and clairvoyance being real and nonphysical, proposes a "three-aspect model of consciousness": matter, mind (nonphysical), and pure awareness (an "absolute"). In his model, "pure awareness energy" interacts with a brain to produce consciousness in the mind, which exists in a nonphysical dimension of reality. The information produced by the activation pattern of neurons in the unique wiring structure of a specific brain dissociates and is rendered into a "pure information" format which is universal and available nonlocally to enter the contents of consciousness of any suitably receptive brain-mind (Graboi, 2023).

17.12. Near death experiences, survival, past lives

Near-death experiences (NDEs) command great popular interest but receive only modest discussion here on the Landscape. Obviously, if even a minuscule fraction of this vast ocean of anecdotes were actually true, it would instantly falsify every Materialism Theory and support (but not confirm) a host of nonphysical theories.

NDEs are out-of-the-body experiences (OBEs) that are triggered during catastrophic physical trauma that leads to "death" in terms of heart stoppages, and generally feature a cluster of common characteristics: a feeling of floating above or beyond one's body; a sense of movement toward a bright light with a benevolent aura; a capacity to commune with deceased loved ones; and the presence of a spiritual Being or beings who radiate warmth and love (whose names or traits vary according to the religion or culture of the NDE experiencer). NDEs have been recorded throughout history and across cultures, often associated with mystical traditions.

Of all the requests we receive from viewers of *Closer To Truth*, NDEs surely rank first, and survival/past lives probably second. My response goes something like this: "I have followed NDE accounts, both experiencers/advocates and skeptics/debunkers, but I do not find sufficient depth and diversity, beyond the obvious confirming enthusiasm of the former and the obvious denying critique of the latter, to warrant the kind of explorations we do on *Closer To Truth*. We are not in the business of adjudicating claims of NDEs and survival/past lives (as we are not with ESP). What we do is to explore the implications or ramifications of such claims, *if they would be true,* from an ontological perspective and with critical thinking (which CTT does with ESP)." (For a pioneering and exploratory exception, *Closer To Truth* features the experimental work of Sam Parnia, a medical scientist who explores NDEs under a new name, "Recalled Experiences of Death [Parnia et al., 2022; Parnia, 2014].)

[63] Sheldrake claims that controlled experiments anticipating phone calls and emails validate his claims; many scientists disagree, citing faulty or inadequate experimental design. Sheldrake's technical papers are on his website: https://www.sheldrake.org/research (Sheldrake, n.d.a).

While popular accounts of NDEs, such as Eben Alexander's *Proof of Heaven: A Neurosurgeon's Journey into the Afterlife*, have widespread impact, they are generally not taken seriously by the scientific or medical communities (Alexander, 2014). Quite apart from the blizzard of anecdotal accounts, there have been scientific studies of NDEs, survival and past lives. Most notable, perhaps, is the work of the Division of Perceptual Studies (DOPS) at the University of Virginia School of Medicine, which claims to have documented thousands of cases. Founded by Dr. Ian Stevenson and advanced by Dr. Bruce Greyson, DOPS strives to challenge the "entrenched mainstream view by rigorously evaluating empirical evidence suggesting that consciousness survives death and that mind and brain are distinct and separable" and that science needs "to accommodate genuine spiritual experiences without loss of scientific integrity" (DOPS, n.d.; 17.13).

The Bigelow Institute for Consciousness Studies (BICS) was founded to support research into the survival of human consciousness after physical death. (Bigelow, 2023). BICS's essay contest to "present evidence beyond reasonable doubt," as if in a court of law, "for the survival of consciousness after permanent physical death ('life after death,' or 'the afterlife')" attracted 204 essays and produced 29 winners."[64]

Jeffrey Mishlove, the host of a long-running TV and web series *New/Thinking Aloud*, who has a PhD in Parapsychology from Berkeley, won BICS first prize for his comprehensive presentation of the pro-survival arguments. He begins by pointing out that "a belief in postmortem survival of consciousness is common to every culture, nationality, religion, and linguistic group in every region and historical period on Earth. Every single one!" For example, American belief in life after death has been stable for 75 years at over 70%, even while religious affiliation has been dropping. Mishlove's best evidence for postmortem survival is the big picture of what he says are nine largely independent categories "all pointing to postmortem consciousness:" near-death experience; after-death communications; reincarnation cases; peak in Darian experiences (visions of dead people who are not known at the time to be dead); instrumental trans communication (electronic devices for communication with the deceased; xenoglossy (the ability to converse in a language one has never learned); possession; mental mediumship; and physical mediumship (Mishlove, 2021).

Dr. Pim van Lommel, a cardiologist, won BICS second prize for his reporting on recent scientific research on NDEs, especially in survivors of cardiac arrest, with "strikingly similar results and conclusions." His claim is that NDEs seem "to be an authentic experience which cannot be simply reduced to imagination, fear of death, hallucination, psychosis, the use of drugs, or oxygen deficiency." Using examples of nonlocal consciousness beyond the brain, for instance during a period when the brain is either non-functioning or malfunctioning, he argues that "there are now good reasons to assume that our consciousness does not always coincide with the functioning of our brain: enhanced or nonlocal consciousness can sometimes be experienced separately from the body." The general conclusion of scientific research on NDE, he says, "is indeed that our enhanced consciousness does not reside in our brain and is not limited to our brain. Our consciousness seems to be nonlocal, and our brain facilitates rather than produces the experience of that consciousness." He concludes that "death, like birth, may be a mere passing from one state of consciousness into another" (Van Lommel, 2022).

One intriguing parapsychological critique of NDE survival stories is "super-psi" or "living agent psi" where information is gleaned via telepathy or clairvoyance not by post-mortem communications, a position affirmed by Braude (1992) and denied by Mishlove (2021).

There are of course many physicalist, physiological and psychological critiques of NDEs, OBEs, life-after-death stories, and all the survival arguments; such critiques are widely available. While oxygen deprivation has been a common explanation for NDEs, more sophisticated analysis suggests "a sort of blending of conscious states: waking, rapid-eye movement (REM) sleep and non-REM sleep." Neurologist Kevin Nelson posits, "The physiological balance between conscious states is disrupted during the conditions of near-death, leading the brainstem arousal system controlling conscious states to blend waking and rapid eye movement consciousness into a hybrid state known as REM intrusion … [and] REM intrusion leads to many key features of near-death, including lying still, visual activation, out-of-body, and the experience's narrative qualities" (Freeman, 2023).

That NDEs are being taken more seriously by the scientific community was evidenced by a conference held by The New York Academy of Sciences, "Explorations in Consciousness: Death, Psychedelics, and Mystical Experience." Participants describe NDEs, which are sometimes called periods of "disconnected consciousness," as surprisingly common—according to one report, "15 percent of intensive care unit patients and up to 23 percent of survivors of cardiac arrest reported having had one" (Freeman, 2023).

The claim is that because more people survive cardiac arrests—due to substantially improved resuscitation techniques—more NDEs are reported and the field has emerged as a legitimate one for scientific inquiry. That NDEs can be emotionally transformative provides opportunity to examine mental health issues, both the positive feelings of enhanced compassion or purpose and the negative after-effects of bad dreams and persistent intrusive thoughts. Calling evolutionary explanations for NDEs "just-so stories," Christof Koch said, "They may be true. They may be false. It just doesn't matter. But the fact that we do have [these] experiences—that is the remarkable thing" (Freeman, 2023).

The fact that some NDE experiencers describe a reduced fear of death does not ipso facto mean, obviously, that death is any less physically final and that consciousness is any less entirely material. Moreover, it is difficult to imagine what kinds of observations or experiments could count as scientifically dispositive that NDEs confirm post-mortem survival.

17.13. DOPS's consciousness research and theory

The Division of Perceptual Studies (DOPS), a research unit within the Department of Psychiatry and Neurobehavioral Sciences at the University of Virginia, has contributed both empirically and conceptually to emerging nonphysical theories of consciousness, which picture mind as irreducible and grounded in some sort of highest consciousness which forms the ontological foundation of reality as a whole. DOPS cognitive scientist/parapsychologist Ed Kelly contends that "the limitations of contemporary mainstream consciousness theorizing derive from the systematic unwillingness of the physicalist camp to take difficult empirical phenomena such as psi and mystical experience into account" (DOPS, n.d.; Kelly, 2024).

DOPS was founded in 1967 by psychiatrist Ian Stevenson and has been dedicated to research related to the possibility of postmortem survival. According to Kelly, "Survival is a watershed issue theoretically, in that demonstration of its occurrence as an empirical reality would immediately rule out most if not quite all of the materialism theories. Clearly, if the prevailing physicalist 'production' model of mind-brain relations is correct in claiming that mind and consciousness are manufactured entirely by neurophysiological processes occurring in brains, then it follows logically and inescapably that postmortem survival is impossible, period" (DOPS, n.d.; Kelly, 2024).

DOPS staff have published hundreds of research papers in refereed journals, plus over a score of books, on reincarnation, near-death experiences (NDEs) and other survival-related topics such as crisis apparitions, mediumship, and after-death communications (DOPS, website). Stevenson himself was the primary architect of a major project involving small children who begin at a very early age to speak and act as though they are remembering, or expressing behaviorally, potentially verifiable events that took place in the life of a recently deceased person. Most interestingly are the relatively few cases in which the child's statements

[64] All 29 Bigelow winning essays are here: https://www.bigelowinstitute.org/index.php/essay-contest/.

and behaviors were well documented before the previous personality (PP) was identified. Stevenson found "cases of the reincarnation type" (CORT) everywhere he looked, primarily but not exclusively in socio-cultural settings where their occurrence is not unexpected. He and various colleagues have so far investigated over 2500 cases, around 2000 of which have been deemed of sufficient quality to merit laborious encoding of associated variables for inclusion in a cumulative database. Systematic properties include a very high proportion of violent or premature death in the PPs, which, DOPS researchers speculate, might relate to why some children remember but others do not. Other findings include confusions surrounding gender in children who report memories of a life as a person of the opposite sex. Stevenson paid special attention to a subset of over 200 cases in which the child displays birthmarks or birth defects, often extremely unusual in form, corresponding to fatal injuries suffered by the PP (Stevenson, 1997).

Another major line of research, spearheaded by psychiatrist Bruce Greyson, has focused on NDEs. Greyson and colleagues have investigated a large number of such cases and created a second DOPS database containing over a thousand what they consider good cases. Of special interest are the hundreds of cases in which NDEs have occurred under extreme physiological conditions such as deep general anesthesia and/or cardiac arrest, conditions in which almost all contemporary neuroscientists would expect that patients should report no conscious experience whatsoever, let alone the most meaningful and transformative experiences of their lives—in effect, mystical experiences occurring under life-threatening conditions. Numerous physiological explanations have been offered for NDEs, but none, DOPS argues, can withstand scrutiny (Greyson et al., 2009).

Of particular interest here is the DOPS theoretical work opposing physicalism, led by Ed Kelly and involving fifty or so scholars from diverse academic disciplines (over a period of more than two decades). Motivated by DOPS's empirical studies, DOPS's theorizing in regard to the mind/brain relationship and consciousness are presented in three books. The first is *Irreducible Mind*, which describes various psychophysical phenomena that appear difficult or impossible to explain in conventional physicalist terms. These include psi and survival data, along with other non-standard empirical phenomena such as stigmata and hypnotically induced blisters; prodigious forms of memory and calculation; psychological automatisms and hidden or secondary centers of consciousness; near-death and out-of-body experiences, emphasizing experiences occurring under extreme physiological conditions; genius-level creativity such as that of the Indian mathematician Ramanujan; and mystical experiences, whether spontaneous, pharmacologically induced, or occurring in conjunction with transformative practices such as an intense meditative discipline of some sort (Kelly et al., 2007).

The main import of *Irreducible Mind*, apart from its systematic empirical attack on physicalism, Kelly says, is to marshal support for a model of the human psyche advanced by F. W.H. Myers and developed philosophically by William James. Contrary to today's prevailing conception, which views everyday consciousness as the only consciousness, generated entirely by physiological processes in the nervous system, the Myers/James picture includes at least one level of normally hidden and more comprehensive consciousness that exists independently of the organism and is equipped with "adits and operations" of its own which provide access to wider and deeper parts of the reality in which we find ourselves embedded (Myers, 1903).

According to Kelly, this sort of "permission" or "transmission" or "filter" model of the psyche (James, 1900), in which everyday consciousness takes forms dependent on interactions between a more inclusive and capacious consciousness and an organism that serves mainly as a sensorimotor interface, may initially sound strange to our modern ears, but, Kelly argues, "there is now a lot of evidence to support it." It also has strong affinities to views advanced by Bergson (17.1), Jung (17.2), and the Indian philosophical tradition with its "subtle" mental and physical worlds interposed between everyday experience and an ultimate consciousness of some sort (16.1, 16.7, 16.9, 16.10, 16.13). Ongoing research seeks to identify conditions in the mind and body that encourage what Myers termed "subliminal uprush", or expression in everyday consciousness of information and capacities normally confined to James's hidden "More"—for example, using functional neuroimaging techniques for research on meditation and psychedelics.

The second book, *Beyond Physicalism*, is more explicitly theoretical, seeking to identify alternative conceptual frameworks, or worldviews, or metaphysical systems, that could permit the psi or paranormal empirical phenomena catalogued in the first book to occur. These include a range of theories: a modernized form of interactive dualism (15.8); process philosophy (13.12); quantum theories of Henry Stapp (11.2), Harald Atmanspacher (14.7), Bernard Carr (11.10); mystically-informed philosophies such as those of the Neoplatonists, Samkhya/Yoga, and Kashmiri Shaivism, and Western philosophical figures including Leibniz, Peirce, and Whitehead (Kelly et al., 2015).

Kelly argues that the central tendency is toward some sort of Idealism (16), most likely of the type known as (evolutionary) panentheism (Hartshorne and Reese, 2000). Kelly stresses that "The precise form that an adequate theory will take is powerfully constrained by the need for it to incorporate or at least respect the discoveries of modern physics, making it an objective or realist idealism as opposed to a subjective idealism of the sort advocated by Bishop Berkeley." Several of Kelly's collaborators—Federico Faggin (11.12), Bernard Carr (11.10), and Bernardo Kastrup (16.4)—are explicitly working in this direction, as is Mira Albahari (16.13) from the perspective of Indian idealisms. All such theories, Kelly points out, can potentially make room not only for "rogue" phenomena such as psi and survival, genius, and mystical experience, but also for experiences of value, meaning and purpose so vital to real human life. Conversely, Kelly believes that these metaphysical frameworks imply "poor prospects for artificial *general* intelligence and virtual immortality" (Kelly, 2024).

The third book, *Consciousness Unbound* (Kelly and Marshall, 2021), has three parts. The first part is empirical, summarizing the state-of-the-science for precognition, NDEs, and CORT. The second part presents additional non-physicalist conceptual frameworks, including those of Max Velmans (14.3), Bernardo Kastrup and Federico Faggin. The third part explores implications of the emerging theoretical picture for consciousness research, the humanities, and the current landscape of mind/brain metaphysics.

17.14. Bitbol's phenomenological ontology

Philosopher of science Michel Bitbol suggests that a radical view of neurophenomenology (9.6.5) amplifies "the available range of interpretations of altered states of consciousness, from OBEs and NDEs to meditation and psychedelics, and which may suggest a new ontological category. There are generally three such interpretations, he says: "two objectivist-realist and one non-committal (mild) phenomenological interpretation." According to the objectivist-realist approaches, he says, "these states refer to worldly or other-worldly objective processes. They refer either to an alteration of the brain's biochemical balance, thus giving rise to hallucinations, or to a backstage supernatural (but 'real') world which discloses itself to (say) dying people."

In contrast, Bitbol says, "according to the non-committal phenomenological approach, instead, these states are relevant by themselves, as transformative experiences for those who live through them." This latter approach, advocated by Evan Thompson as well as by Bitbol, take "a decisive step beyond the sterile conflict between naturalism and supernaturalism. It shows that despite their superficial disagreement, both positions share the same crucial but disputable strategy: escaping one's own lived embodied situation and striving towards some (natural or super-natural) transcendent realm of being" (Bitbol, 2015; Thompson, 2014).

Bitbol sees a big vision here. "But the clarifying role of phenomenology is not bound to stop at this point. One can take further advantage of a truly radical phenomenological approach, and thereby endow the

transformative experiences with additional significance. According to Merleau-Ponty (who partly agreed with Heidegger and Sartre on this point), phenomenology, in its mature state, becomes a new form of ontology: not a straightforward ontology of things facing an observer, however, but an 'oblique ontology' of intertwining with what there is (Saint Aubert, 2006); not an ontology of manifest beings, but an ontology of self-manifesting being. As Merleau-Ponty writes, radical phenomenology does not yield a standard 'exo-ontology,' but rather an unexplored 'endo-ontology.' Merleau-Ponty here unambiguously alludes to an ontology expressed from the innermost recesses of the process of being, rather than to an ontology of the external contemplation of beings" (Bitbol, 2015).

This granted, Bitbol argues, "some altered states of consciousness can be understood neither dismissively as illusions, nor neutrally as enthralling experiences, but positively as revealing a state of being which happens to be hidden by intellectual fabrications and by the impulse of intentional directedness." Here, to avoid misunderstandings, Bitbol clarifies that "unlike in super-naturalism, there is no question here of reaching some remote domain of transcendent being, but only of self-disclosing an exquisitely proximate mode of being, which is permanently present but usually neglected: perhaps what Tibetan Dzogchen practitioners call 'the nature of mind,' which, in this non-dualist context, is likely to be simultaneously the (self-experienced) nature of being" (Bitbol, 2015).

17.15. Campbell's theory of everything

Consciousness researcher (and former nuclear physicist) Thomas Campbell presents "My Big TOE," his theory of everything: "Consciousness is the fundamental reality. The physical world is an illusion, a virtual reality that only exists in our minds. We are Individuated Units of Consciousness: immortal, interconnected parts of a Larger Consciousness System. We choose to be players in the virtual reality game called life on Earth, set in a virtual universe computed by the system to aid our consciousness evolution.… Our goal: to learn from the outcomes of our choices in order to grow up and evolve the quality of our consciousness from fear to love. By evolving our individual consciousness quality from one round of the game to the next, we advance the evolution of the entire consciousness system" (Section: Campbell, 2003/2007, n.d.).

Rejecting Dualism, Materialism and Idealism, Campbell claims all questions and objections are answered and resolved "if we conceive of the physical universe as a virtual reality," the core idea of My Big TOE. Moreover, My Big TOE "provides entirely rational explanations for many phenomena dismissed by mainstream science as 'weird' (quantum effects), 'mysterious' (consciousness), 'illusory' (free will) or 'delusions' (paranormal experiences)." For example, paranormal phenomena are natural artifacts of a virtual universe.

As for the hard problem of consciousness, it is supposedly "solved—or rather, dissolved—once we drop our belief in a fundamental external reality." The virtual reality model helps us do that, Campbell says. In this view, "our subjective perception is not some 'internal' representation of an 'external' world: There is no objective world outside of us."

But if our reality is a simulation, who or what is doing the simulating? Is this not just kicking all the conundrums, such as consciousness, up a level? My Big TOE is ready with a "Larger Consciousness System" (LCS) that computes virtual realities, noting, unlike the God of religions, LCS "demands neither praise nor worship."

In the very beginning, Campbell's big conjecture goes, "all that may have existed was an Absolute Unbounded Oneness (AUO)—an undifferentiated, elementary consciousness with a potential to evolve into the highly complex, unfathomably vast LCS of today. AUO was barely aware, but it did have the potential to develop all the attributes of consciousness, including awareness, perception, cognition and free-will choice-making."

Driven, somehow, by an inherent drive towards complexity, "when AUO reached its evolutionary limits as a monolithic block of consciousness, a single source of choosing, it made a crucial decision: AUO split itself into unfathomably many interconnected but autonomous pieces, a process we can imagine like partitioning a computer hard drive into multiple partitions. The idea was for all the different pieces to build something more innovative and creative than a single mind would ever be able to come up with." At that fateful moment, Campbell says, "the One became the Many: the Absolute Unbounded Oneness (AUO) turned into an Absolute Unbounded Manifold (AUM)," which led to the genesis of the Larger Consciousness System," which provides, according to My Big TOE, the simulations of our virtual universe today (Campbell, 2003/2007, n.d.).

17.16. Hiller's eternal discarnate consciousness

Maverick physicist Jack Hiller posits an "eternal discarnate consciousness" or, as he says, in common parlance, the "soul"—which, "when freed from its hard attachment to the body, functions in a Universal Field of Consciousness (UFC) which may also be characterized as the mind of God." The soul brings to the body the moral values that exist in the UFC and these values may often conflict with, in Hiller's Freudian terms, "the Id and the Ego's pleasure-seeking functions." (Hiller, 2021). The theory hypothesizes that the individual consciousness (spirit and soul) functions in this UFC, both in life and in eternity, before and after an Earth life (Hiller, 2019).

Hiller bases his theory on what he says are many thousands of out-of-body experiences (OBEs) associated with near-death experiences, including many documented cases in which researchers were able to verify accurate reporting about the activities observed during the OBE that could not be accounted for by normal sense-perception (Rivas et al., 2023). He stresses OBEs' peculiar, nonphysical characteristics: time no longer has meaning, does not flow, and the past and present, even some future events, are available to see and experience; visits may be made to Earth locations distant from the body, or out to the cosmos; perception is radically enhanced, e.g., visual perception is 360°, with an ability to focus down to atomic particles or up to the cosmos; everything appears to be made of light; thinking and movement by thinking are instantaneous; all entities, inanimate as well as diverse animate, exude consciousness; individual consciousness, souls, connect telepathically; the world experienced is multidimensional, more than space-time; by existing in the universal field of consciousness, all knowledge is felt as available, and one feels part of God and God's love for all (Hiller, 2020). Hiller speculates that if quantum entanglement can be conceptualized as some kind of signaling at infinite speed across any distances, there could be a deep relationship between quantum mechanics and reported instances of discarnate consciousness.

17.17. Harp's universal or God consciousness

Physicist and "spiritual scholar" Dennis Harp, who seeks to unify theoretical physics and spiritual teachings, claims that "each of us exists as consciousness attached to a mind and body, making sense of the universe by experiencing individual states in a causal sequence." Motivated by a personal NDE as well as NDE research, Harp asserts that with contemplative practices, we can learn (eventually) "to detach from the body and explore the universe in a non-physical manner. Finally, we detach from the mind as well, and experience the entire universe at once in the shared view called Universal, or God Consciousness. Thus, what we call consciousness is somehow the union of this Universal or God Consciousness with our mind and body (Harp, 2022).

To Harp, theoretical physics "is comfortable with the possibility of the infinite complexity of infinite universes, along with universal waveform collapse and reinflation every instant in order to explain causality." However, he says, "causality is only necessary as long as the mind is interpreting, or 'making sense' of the universe. Since consciousness can experience the universe independent of the mind, beyond

the realm of space and time, it experiences all quantum mechanical states simultaneously, and no interactions occur at all. This static universe unifies theoretical physics and mystical teachings" (Harp, 2022).

17.18. Swimme's cosmogenesis

Mathematician and integral studies professor Brian Swimme presents the cosmology of a creative universe—cosmogenesis—in which human consciousness plays an essential role. He views the evolution of the universe toward greater complexity and consciousness as "the ultimate aim of the universe." It is a creative universe that develops through time from plasma to galaxies to living planets to human consciousness, "a universe that can intend something even before human consciousness emerges" (Swimme, 2022).

Swimme bases his ideas on the teachings of Thomas Berry, a Catholic priest, cultural historian, and world religion scholar, who spoke of "the spirituality of the universe," using "the word 'spirituality' to correct a deformation in modern consciousness, that imagined the existence of a 'physical universe.'" Such a conception no longer made sense, Berry said, because in the 20th century, "we discovered that the matter of this universe—the only matter we know of—constructs life. There is no such thing, then, as 'lifeless matter.' Matter, in its very structure and dynamism, generates life." Consciousness, then, is built into the fundamental fabric of the universe. What will happen, Swimme asks, "when we turn our consciousness around and realize that our awareness of cosmogenesis is also the work of the universe? How will we change when we face the universe and find the universe facing us?" (Swimme, 2022).

17.19. Langan's cognitive-theoretic model of the universe

Independent thinker, autodidact Christopher Langan claims that what he calls the "Cognitive-Theoretic Model of the Universe" (CTMU) provides the logical framework of a true "Theory of Everything." It explains "the connection between mind and reality" (note "cognition" and "universe" in the same phrase); and "proves the existence of God [as defined], the soul, and an afterlife" (Langan, 2024).

CTMU posits information as the most fundamental constituents of reality. The universe is a vast arrangement of digital information and the mathematical relationships between them. At the same time, "it is only through consciousness that we can perceive or know anything at all. Thus, our reality can just as well be conceived as a vast network of conscious experiences: perceptions and the laws which govern them." Because there is nothing outside reality, reality must contain all of the conditions necessary for its own existence, and given sufficient time, "even mere possibility is enough to ensure that it generates itself" (Section: *CTMU Wiki*, n.d.).

Although this kind of mind, which Langan calls God's mind, "sits in knowledge of itself in an unchanging, eternal way, it contains within it all of the processes required for it to refine itself into existence out of nothingness." It is here, according to CTMU, that "consciousness is stratified: the bottom stratum is the all-knowing mind of God," within which "all of the more superficial strata of consciousness" are contained. From God's perspective, God "is aware of all the steps in its own creation." However, from the perspective of these more superficial strata—of which our human minds are pieces—the universe appears as a physical entity unfolding in physical space. But because "our conscious minds are contained within God's consciousness … we retain the creative power and freedom of God on a scale that is localized in time and space."

CTMU describes reality as "a Self-Configuring Self-Processing Language, a reflexive intrinsic language characterized not only by self-reference and recursive self-definition, but by full self-configuration and self-execution" (Langan, 2002). Embedding issues of absolute morality and karma, "if we choose to act in a way that is in line with the telos, those parts of our minds that match the mind of God get preserved and we basically move closer to the all-knowing substratum, or the consciousness of God. If we act against the telos, what happens may be that those elements of our minds that do not match the mind of God get recycled endlessly until they properly refine themselves."

In short, CTMU's reality "is a self-refining informational system which, due to its form, cannot NOT exist. Even if there is nothingness, this system will exist and know itself and all of the localized conscious minds within its creation process will experience its informational structure as real, physical, etc. It is thus self-creating, as it requires nothing outside of itself to exist" (*CTMU Wiki*, n.d.).

17.20. Meditation and the brain

The scientific consciousness community generally recognizes that meditation can provide insights into consciousness, at least enriching descriptions. But our question goes deeper: Can meditation help discern the fundamental nature or essence of consciousness?

Deep meditation, especially as practiced by Eastern traditions, is an altered state of consciousness that induces changes in the brain. Studies show that meditation, if done regularly, can help relieve symptoms of chronic pain (Trafton, 2011); and that mindfulness meditation programs have moderate evidence of improved anxiety and depression as well as pain relief[65] (Goyal et al, 2014). What is happening in the brain?

Studies suggest that alpha waves (~7–14 Hz), which are modulated in primary sensory cortex during selective attention, have a mechanistic role in perception. During "mindfulness" meditation, a common practice requiring sustained attention to body and breath-related sensations, people were better able to control their alpha rhythms, thereby implicating "this form of enhanced dynamic neural regulation in the behavioral effects of meditative practice" (Kerr et al., 2011). The idea is that alpha waves help suppress irrelevant or distracting sensory information, diminishing the likelihood that extraneous stimuli "will grab your attention" and enhancing the likelihood that you can better focus and "better regulate how things that arise will impact you" (Trafton, 2011).

In the highest meditative state possible in Theravada Buddhism—*nirodha-samāpatti*, translated roughly as "the cessation of thought and feeling"—overall brain synchronization is reduced. This means that while during normal consciousness different parts of the brain are communicating predictively with other parts, during *nirodha-samāpatti* (i.e., the deepest trance-retreat into the mind, an utter absence of sensation and awareness, with all mental activity temporarily suspended), the brain is desynchronized, no longer functioning as an integrated unit. (Interestingly, similar brain desynchronization occurs when people are given anesthetic doses of propofol or ketamine, but not during sleep) (Love, 2023).

It is clear that meditation, which alters consciousness, also alters specific brain wave patterns, thereby giving support to various Materialism Theories (e.g., Brain Circuits and Cycles Models, 9.2.11, and Electromagnetic Field Theories, 9.3). Moreover, the brain desynchronization that accompanies the cessation of consciousness seems to support Global Workspace Theory (9.2.3), because the brain activity seems no longer in the same sense "global," and Integrated Information Theory (12.), because the brain seems no longer in the same sense "integrated." Obviously, these results do not disprove nonphysical theories of consciousness, which could be consistent with this same set of facts.

17.21. Psychedelic theories of consciousness

Throughout human history, psychedelics have been used for spiritual purposes by inducing altered conscious experiences dramatically different from the norm. Colors explode. Time slows, speeds up, stops.

[65] Note: Meditation is not a panacea; it did no better than any active treatment (i.e., drugs, exercise, and other behavioral therapies) on positive mood, attention, substance use, eating habits, sleep, and weight; the meta-analysis also showed low evidence of improved stress/distress and mental health–related quality of life (Goyal et al, 2014).

Self shatters, dissolves. Magical creatures emerge. Spirit Beings appear. All is alive. All is connected. All is One. Some attribute the advent of religion to the use of psychotomimetic or hallucinogenic substances in rituals. In each culture or condition, interpretations of psychedelic experiences were made. Mystics conjoined with cosmic consciousness. Indigenous traditions communed with sentient beings from spirit worlds. Aldous Huxley saw the source of all mysticism and spirituality, which he developed into the "perennial philosophy," related to psychedelics. Psychedelic missionaries in the 1960s sought short-cut insights into consciousness (Philosophy of psychedelics, 2023). Materialists like Sam Harris argue for a naturalized spirituality (Explorations in Consciousness: Death Psychedelics and Mystical Experience, 2023).

There is much to be gained from psychedelic research. Not included, as I see it now, is independent support for non-materialist theories of consciousness. No matter how connected, spiritual or other worldly psychedelic experiences may seem, no matter how intense the sense of "Oneness with ultimate reality" may be, it is hard to imagine how psychedelic experiences could unlock the door to new external realities, any more than how seeing stars from a blow to the head could open the window to new vistas of the world. Other arguments perhaps can, but psychedelic arguments probably can't. (Metzinger describes the psychedelic experience as "epistemically vacuous" [Metzinger, 2004]. But see Kastrup, 2024.)

The best one could claim is that psychedelic or hallucinogenic visions would be "consistent with" nonphysical theories of consciousness. On the other hand, psychedelic research may well selectively advance various Materialism Theories of consciousness, of which there are many.[66] (Not a few viewers of *Closer To Truth* have advised me: "If you *really* want to get 'closer to truth,' you really need to go psychedelic.")

Psychedelic drugs "induce drastic changes in subjective experience, and provide a unique opportunity to study the neurobiological basis of consciousness" (Herzog et al 2023). By administering psychedelic drugs to disrupt how the brain perceives and models the world while we're awake, researchers seek to understand how the conscious brain works (Can psychedelic drugs, 2022). In other words, assessing the neural mechanisms of how psychedelic drugs alter consciousness might provide clues to the neural basis of normal consciousness. For example, LSD and ketamine, though targeting separate brain receptors, induce similar neural oscillation patterns across the brain, indicating synchronized neural behavior. Such "synchronized neural activity might be more linked to the psychedelic experience than the activity of individual neurons" (Psychedelics Sync Neurons, 2023). If so, this distinction could support Electromagnetic Field Theories (9.3).

Carhart-Harris and Friston formulate a theory of psychedelic action by integrating Friston's free-energy principle (9.5.4) and Carhart-Harris's entropic brain hypothesis (9.5.6). They call this formulation "relaxed beliefs under psychedelics (REBUS) and the anarchic brain, and it is founded on the principle that—via their entropic effect on spontaneous cortical activity—psychedelics work to relax the precision of high-level priors or beliefs, thereby liberating bottom-up information flow, particularly via intrinsic sources such as the limbic system" (Carhart-Harris and Friston, 2019).

Psychedelic drugs have been shown to trigger altered states of consciousness similar to those seen in people experiencing near-death experiences (NDEs). Clinical evidence indicates that psychoactive agents can reduce emotional distress in terminally ill people, much as NDEs do after cardiac arrests. Dr. Anthony Bossis showed that "a single treatment with psilocybin—a psychoactive compound found in some mushroom species that humans have consumed for thousands of years—brought rapid reductions in depression, anxiety, and hopelessness in people with terminal cancer." The benefits of psilocybin treatment, he said, were greatest among individuals who reported strong mystical experiences during the sessions. "The more robust that mystical experience, the greater the outcome in terms of reduction of depression," Dr. Bossis said. "These aren't NDEs," he added, "but they're deathlike experiences with a similar phenomenology" (Freeman, 2023).

Psychedelic experiences can have profound impact on belief systems, especially regarding religion, philosophy and ultimate reality (Carhart-Harris and Friston, 2019). Even a single such experience can catalyze a radical transformation. Moreover, a single belief-changing psychedelic experience is said to be associated with increased attribution of consciousness to living and non-living entities, even a sense that everything is alive (Nayak and Griffiths, 2022). This seems a significant result for the construction of belief systems, although any implications for theories of consciousness per se would be at best indirect.

For a perspective more open-minded than mine, philosopher Sarah Lane Richie reports that "emerging scientific and philosophical research on psychedelics … has attracted a growing body of philosophical and theological work on the metaphysical and epistemological possibilities of such experiences." She discusses "the epistemic status of psychedelic experiences," suggesting "there exists a mutually reinforcing relationship between panpsychism and the metaphysical possibility of a veridical interpretation of psychedelic states" (Richie, 2021).

As noted, I have a strong predisposition to dismiss any notion that psychedelics reveal any sort of veridical reality. Insights about brain-mind mechanisms, sure, but no ontological unveilings. Richie and also philosopher Peter Sjöstedt-Hughes, who focuses on psychedelics and consciousness/metaphysics, put a hairline fracture in my bone-strength worldview.

Sjöstedt-Hughes proposes that "Metaphysics should be used to integrate and understand psychedelic-induced metaphysical experiences." (This is not a tautology, he rightly states.) He argues that "there is a potential extra benefit to patients in psychedelic-assisted therapy if they are provided with an optional, additional, and intelligible schema and discussion of metaphysical options at the integrative phase of the therapy." (He offers a "metaphysical matrix" with five columns—Physicalism Idealism, Dualism, Monism, Transcendent—and two special rows, Panpsychism and Theism.) (Sjöstedt-Hughes, 2023).

Sjöstedt-Hughes presents his case. "If the mind-matter relation is an unresolved problem, then psychedelic induced intuitions and visions of alternate frameworks of reality within which to see this problem should not be immediately dismissed as mere hallucination. We cannot judge what is hallucinatory if we do not know what is real. Thus, the hard problem of consciousness bears directly upon the hard problem of psychedelic consciousness—the problem of determining the truth or delusion of certain psychedelic experiences." He asks, "whether psychedelic experiences are *conditioned* by one's culture or whether they *decondition* one from one's culture into a transcendent state." He concludes, "the experiences that psychedelics can occasion might not be mere delusion but may hold true insights about the nature of ourselves and the cosmos of which we are parts" (Sjöstedt-Hughes, 2022).

About ourselves? I agree totally. About the cosmos? I remain almost totally skeptical (but no longer *totally* skeptical).

Psychedelic experiences are well worth researching, phenomenologically and neurobiologically. But I'm not waiting for psychedelic breakthroughs in discerning the ultimate theory of consciousness. Granted, according to psychedelic researchers Yaden et al., "psychedelic substances produce unusual and compelling changes in conscious experience," which "have prompted some to propose that psychedelics

[66] In recent years, mainstream medicine has transformed psychedelic research into a legalized, innovative field, both for the treatment of mental health and neurological disorders and for explorations of consciousness. In 2000, the Johns Hopkins Center for Psychedelic and Consciousness Research became the first to obtain regulatory approval in the United States to reinitiate research with psychedelics in healthy, psychedelic-naive volunteers (Johns Hopkins Center) (https://hopkinspsychedelic.org). Another example is the New York Academy of Sciences conference, "Explorations in Consciousness: Death, Psychedelics, and Mystical Experience" (2023)—https://events.nyas.org/event/7d309c25-5b4d-4ae7-af68-59ace2817707/summary.

may provide unique insights explaining the nature of consciousness." Yet, they say, "At present, psychedelics, like other current scientific tools and methods, seem unlikely to provide information relevant to the so-called 'hard problem of consciousness'" (Yaden, 2021) (Could psychedelics, however, shed light on the nature of subjectivity and selfhood, which are indirectly related to the hard problem?) The authors are optimistic that psychedelic research can help solve "multiple 'easy problems of consciousness,' which involve relations between subjectivity, brain function, and behavior." They conclude by calling for "epistemic humility" (Yaden, 2021)—which is sage advice for everyone working on consciousness, present company included.

18. Challenge theories

The eight "Challenge Theories" that follow portray the profound depth and perhaps intractability of the mind-body problem. They are long on diagnosing the explanatory disease—largely fallacies of materialism theories of mind—but short on offering prescriptive solutions. They are long on hearty speculation, short on confident conclusions. They are important signposts or benchmarks on the Landscape of Consciousness, and appropriately, they come last, part of the take-away message.

18.1. Nagel's mind and cosmos

Philosopher Thomas Nagel famously shook up the philosophy of mind with his seminal article, "What is It Like to be a Bat?" He begins with the premise that "reduction euphoria," which aims to explain consciousness by "some variety of materialism, psychophysical identification, or reduction" gets it "obviously wrong," and he states upfront and repeats at the conclusion, "we have at present no conception of what an explanation of the physical nature of a mental phenomenon would be" (Nagel, 1974).

Nagel's essay focuses on the nature of subjective experience, which could differ widely among different sentient creatures (hence the "bat" of the title). His point is that "It is like something" to have a conscious experience; it is not like nothing. It is perhaps Nagel's footnote on the phrase that has had the most lasting impact: "Therefore the analogical form of the English expression "what it is like" is misleading. It does not mean "what (in our experience) it *resembles*," but rather "how it is for the subject himself" (Nagel, 1974).

Nagel does not conclude that physicalism with respect to consciousness is false. "Nothing is proved by the inadequacy of physicalist hypotheses that assume a faulty objective analysis of mind. It would be truer to say that physicalism is a position we cannot understand because we do not at present have any conception of how it might be true" (Nagel, 1974).

Thirty-eight years later, Nagel published the controversial *Mind & Cosmos: Why the Materialist Neo-Darwinian Conception of Nature Is Almost Certainly False*, and he goes further: "The failure of reductionism in the philosophy of mind has implications that extend beyond the mind-body problem. Psychophysical reductionism is an essential component of a broader naturalistic program, which cannot survive without it" (Nagel, 2012). Thus, Nagel rejects wholly physicalist/materialist explanations, not only for consciousness but also for all reality!

Nagel is no theist. ("It isn't just that I don't believe in God and, naturally, hope that I'm right in my belief. It's that I hope there is no God! I don't want there to be a God; I don't want the universe to be like that" [Nagel, 1997].) As a comprehensive worldview, he does not find theism any more credible than materialism. His interest is "in the territory between them." He asserts that "these two radically opposed conceptions of ultimate intelligibility cannot exhaust the possibilities. All explanations come to an end somewhere. Both theism and materialism say that at the ultimate level, there is one form of understanding. But would an alternative secular conception be possible that acknowledged mind and all that it implies, not as the expression of divine intention but as a fundamental principle of nature along with physical law?" (Nagel, 2012).

As a result, Nagel finds himself moving to a universal monism or panpsychism. "If we imagine an explanation taking the form of an enlarged version of the natural order, with complex local phenomena formed by composition from universally available basic elements, it will depend on some kind of monism or panpsychism, rather than laws of psychophysical emergence that come into operation only late in the game" (Nagel, 2012).

Earlier, he had argued that panpsychism would follow from four premises: 1) All is material; there is no spiritual existence, no disembodied souls. 2) Consciousness is not wholly reducible to physical properties. 3) Consciousness is real; mental states exist. 4) Strong emergence is not possible; all higher-order properties of matter can be derived from the properties of its lower-order constituents (Nagel, 1979).

Yet, I choose to classify Nagel under "Challenge Theories," not under Panpsychism or Monism, because he is more passionate to explicate the profundity of the problem than to promote even his kind of solution.

18.2. McGinn's ultimate mystery (mysterianism)

Philosopher Colin McGinn argues that the bond between the mind and the brain is "an ultimate mystery, a mystery that human intelligence will never unravel" (McGinn, 2000). In his classic paper, "Can We Solve the Mind-Body Problem?" McGinn opens his case: "We have been trying for a long time to solve the mind-body problem. It has stubbornly resisted our best efforts. The mystery persists. I think the time has come to admit candidly that we cannot resolve the mystery." He concludes his case thus: "A deep fact about our own nature as a form of embodied consciousness is thus necessarily hidden from us" (McGinn, 1989).

For his fondness of the word "mystery" in the context of consciousness, McGinn was awarded the appellation "mysterian"—not a label of his choosing—and he became an unvolunteered leader of the "New Mysterians," an ad hoc, though serious group of mostly philosophers and some scientists who have come to believe that consciousness may never be explained completely[67] (New mysterianism, 2023). They are distinguished from the "old mysterians" who believed that consciousness is supernatural (from God or the Cosmic Order). The New Mysterians are not dualists or idealists: just because human intellect can never understand consciousness does not mean there is anything supernatural about it. The mind-body problem is simply "the perimeter of our conceptual anatomy making itself felt." McGinn describes his position as "existential naturalism."

McGinn stresses that consciousness in our universe is contingent, not necessary, so it could have been that while the physical laws obtained, no consciousness ever evolved. "Not every world has consciousness in it, so our world might have been a world in which there was no consciousness." This is why, McGinn says, "I'm opposed to the idealist view, or the panpsychist view," that "the physical world itself is somehow inherently spiritual." He says it is "incontestable that consciousness arises solely from the material world" (McGinn, 2007a).

What are possible deep mechanisms? "[Some] have to bring God in to explain how the mind comes into existence," a view that McGinn finds unacceptable. "You might hope you can jettison God from the picture so you have a more scientific version of dualism."

McGinn reveals a wild speculation that he once entertained, a bizarre idea that gives insight into how profound the explanatory problem. "I once played with the idea that there were two universes, which existed through all eternity," McGinn muses. "There's a material universe and there's a conscious universe; they were coarsely isolated, but at some

[67] Owen Flanagan first applied the term "mysterians" to those who argued that the problem of consciousness would be impossible to solve, a pessimistic position he rejected (Flanagan, 1991).

point in universal history there was a kind of causal breakthrough between the two." With this mechanism, consciousness occurs in this "conjoined double universe" because it had existed in the conscious universe for all eternity. "That's a very far out theory," McGinn smiles, "nobody's ever maintained that theory … not even me. I brought it forward to explain what dualism would have to be like in order to even be coherent." (McGinn, 2007b).

McGinn is not alone in wondering if humanity will ever truly understand consciousness. Martin Rees, the UK Astronomer Royal, also questions the human cognitive capacity to discern consciousness (Rees, 2007). Mathematical physicist and leading string theorist Edward Witten, who is optimistic that physics can solve nature's most profound mysteries of fundamental structure and ultimate origins, is pessimistic about prospects for a scientific explanation of consciousness. "I think consciousness will remain a mystery," Witten said, "I tend to think that the workings of the conscious brain will be elucidated to a large extent … But why something that we call consciousness goes with those workings, I think that will remain mysterious. I have a much easier time imagining how we understand the Big Bang than I have imagining how we can understand consciousness …" (Horgan, 2016).

18.3. S. Harris's mystery of consciousness

Philosopher, author, and neuroscientist Sam Harris, who is not known for timidity in offering opinions, does not offer his own theory of consciousness. Instead, he offers a mystery. The problem, he says, "is that no evidence for consciousness exists in the physical world." By this he means that "physical events are simply mute as to whether it is 'like something' to be what they are. The only thing in this universe that attests to the existence of consciousness is consciousness itself; the only clue to subjectivity, as such, is subjectivity." To Harris, it is not an "explanatory gap; " it's an unbridgeable gap (Section: Harris, 2011).

While Harris of course appreciates high correlations between mental states and brain states, "absolutely nothing about a brain, when surveyed as a physical system," he says, "suggests that it is a locus of experience." Consciousness seems the obvious fact about our world, but, "were we not already brimming with consciousness ourselves, we would find no evidence of it in the physical universe—nor would we have any notion of the many experiential states that it gives rise to."

"While we know many things about ourselves in anatomical, physiological, and evolutionary terms," Harris continues, "we do not know why it is 'like something' to be what we are. The fact that the universe is illuminated where you stand—that your thoughts and moods and sensations have a qualitative character—is a mystery, exceeded only by the mystery that there should be something rather than nothing in this universe. How is it that unconscious events can give rise to consciousness? Not only do we have no idea, but it seems impossible to imagine what sort of idea could fit in the space provided" (Harris, 2011).

Harris targets emergence as a false friend in the pursuit of consciousness. He recognizes that "most scientists are confident that consciousness emerges from unconscious complexity." Nevertheless, "this notion of emergence" strikes Harris "as nothing more than a restatement of a miracle. To say that consciousness emerged at some point in the evolution of life doesn't give us an inkling of how it could emerge from unconscious processes, even in principle." He stresses, "This notion of emergence is incomprehensible," then he doubles down: "The idea that consciousness is identical to (or emerged from) unconscious physical events is, I would argue, impossible to properly conceive—which is to say that we can think we are thinking it, but we are mistaken. We can say the right words, of course—'consciousness emerges from unconscious information processing.' We can also say 'Some squares are as round as circles' and '2 plus 2 equals 7.' But are we really thinking these things all the way through? I don't think so."

Harris asserts that "Consciousness—the sheer fact that this universe is illuminated by sentience—is precisely what unconsciousness is not. And I believe that no description of unconscious complexity will fully account for it … an analysis of purely physical processes will never yield a picture of consciousness." Does Harris then hedge? However, he says, "this is not to say that some other thesis about consciousness must be true. Consciousness may very well be the lawful product of unconscious information processing." But his apparent hedge is a feint. "But I don't know what that sentence means," he declares, "and I don't think anyone else does either."

Continuing, Harris asks, "Couldn't a mature neuroscience nevertheless offer a proper explanation of human consciousness in terms of its underlying brain processes?" It's the common consensus among most neuroscientists, which Harris unambiguously rejects. "Reductions of this sort are neither possible nor conceptually coherent," he says. "Nothing about a brain, studied at any scale (spatial or temporal), even suggests that it might harbor consciousness. Nothing about human behavior, or language, or culture, demonstrates that these products are mediated by subjectivity. We simply know that they are—a fact that we appreciate in ourselves directly and in others by analogy."

While Harris is hardly optimistic about science's long-future prospects "to dispel the fundamental mystery of our mental life," and he has little time for conventional religious doctrines, he does see a role for introspection. "Many truths about ourselves will be discovered in consciousness directly," he says, "or not discovered at all" (Harris, 2011).

18.4. Eagleman's possibilianism

Neuroscientist, technologist, and author David Eagleman labels himself a "possibilian" in that he calls for "an openness in approaching the big questions of our existence" (Eagleman, 2010). He embraces "Possibilianism" as an overarching philosophy, rejecting a false dichotomy between either atheism (denying the existence of God) or theism (wholly believing in God)—and he finds agnosticism passive and uninteresting (Possibilianism, 2022). Eagleman's Possibilianism applies, with similar significance, to consciousness (Eagleman, n.d.).

Eagleman says consciousness "rides on top of a massive amount of machinery … it's successive levels of abstraction." Even a basic movement like drinking a cup of coffee triggers a "lightning storm of neural activity that underpins that act." But "I'm not aware of any of that in my consciousness. All I want is a very high-level abstract representation, which is, 'Am I succeeding or am I spilling it on myself?'" (Eagleman, 2011a).

Eagleman draws the analogy between consciousness and the CEO of a large company. "He or she doesn't understand much of anything about the machinery underneath." The CEO's job is setting the company's long-term vision and the plan to accomplish it. "If everything is running just fine, the CEO doesn't even need to know … it's only when something surprising happens that the CEO has to sit up and say, 'OK, what's going on?'" It's exactly the same with consciousness, Eagleman says. "If everything is going as expected, I don't have to be very conscious."

"Why does it [consciousness] feel like something?" Eagleman asks. "That we don't know—and the weird situation is that not only don't we have a theory, but we don't even know what such a theory would look like. Because nothing in our modern mathematics says, well, 'do a triple integral and carry the two' and then here is the taste of feta cheese." We can see "this set of Christmas tree lights [flash in the brain] when you're conscious of this or that—but it still leaves us feeling quite empty as to why it feels that way" (Eagleman, 2011a).

Can we ever, in principle, explain inner experience? "I don't see how," Eagleman says, adding quickly, "Now that is either (a) a limitation of my imagination or (b) … it might be materialism is wrong."

He explains, "The reason neuroscientists generally subscribe to materialism" is "because we have a million examples where brain damage changes the person, changes their conscious state … there's this irrevocable relationship between the biology and the conscious state, but that doesn't mean materialism has to be true. There are alternative theories that could be the case."

Eagleman stresses he is not saying he subscribes to these alternative

theories, but notes, "let me just say, agnostically, they are perfectly possible." No doubt, he concludes, "our mind is integrally dependent on the brain." But "whether this is all that's required or whether there's something else that our science is too young to understand, that's the open question" (Eagleman, 2011b).

18.5. Tallis's anti-neuromania skepticism

Philosopher and humanist Raymond Tallis, a former geriatric neurologist and clinical neuroscientist, has a baffling yet coherent and penetrating perspective on consciousness (my highest compliment) (Tallis, 2011a). He is anti-reductionist in principle, not just in practice, asserting, "We have failed to explain how consciousness equates to neural activity inside the skull because the task is self-contradictory in that we cannot access qualitative, subjective consciousness by means of an objective, often quantitative approach." There is an inevitable failure to explain consciousness in terms of neural activity because there is nothing in such activity that can "explain the 'aboutness' of mental entities, the simultaneous unity and multiplicity of the moments of consciousness, the explicit presence of the past, the initiation of actions that point to an as yet non-existent future, the construction of self" (Tallis, 2010).

Nor can we explain "appearings," Tallis argues, because we are constrained by "an objective approach that has set aside appearings as unreal and which seeks reality in mass/energy that neither appears in itself nor has the means to make other items appear. The brain, seen as a physical object, no more has a world of things appearing to it than does any other physical object" (Tallis, 2010).

Tallis dismantles "the notion that there is close correlation between neural activity and aspects of consciousness." The more carefully you look at it, he says, "the less impressive it is, despite all the advances in recent neuroscience." And correlation, anyway, does not amount to causation or identity. "When you see neural activity in the brain, is that really identical with conscious experience? Let me take a simple example. I'm looking at a yellow object. That will correspond to neural activity in my occipital cortex, at the back of the brain. That neural activity is quite unlike the phenomenal appearance of a yellow object. Yet, according to those who believe in 'neurophilosophy,' the actual phenomenal appearance of the yellow object—my experience of yellowness—is identical with neural activity in the back of the brain. Now, if those two things really were identical, well, at least you might expect them to look a little bit like each other, and of course, they don't. So, to engender conscious experience, there must be something more than neural activity." The brain is no doubt necessary, according to Tallis, but it is certainly not sufficient (Tallis, 2011a).

Tallis runs down the list of potential explanations. He dismisses "naturalistic explanations"—which ultimately means materialistic explanations—[because they] leave consciousness, self-consciousness, the self, free will, the community of minds and the most human features of the human world unexplained" (Tallis, 2009).

What then is Tallis's solution to the mind-body problem? God? Dualism? Panpsychism?

As for supernatural explanations, they "simply parcel up our uncertainties into the notion of an entity—God—that is not only unexplained but usually contradictory." (Tallis, 2009). Tallis is an unrepentant atheist and does not subscribe to any known theory of consciousness. He thinks Cartesian dualism is a lost cause and panpsychism fails to explain how universal mind-dust gathers itself up into a conscious subject (Tallis, 2011b).

"The foundations of phenomenal consciousness and knowledge elude us," Tallis states. "So, some kind of skepticism, justifying an inquiry that enables us to question the all-too-obvious, the glass wall of our everyday thinking about everyday life, seems entirely in order." (Tallis, 2009). "We atheists have good reason to be ontological agnostics and to believe that anything is possible" (Tallis, 2011b).

18.6. Nagasawa's mind-body problem in an infinitely decomposable universe

Philosopher Yujin Nagasawa poses the disruptive idea of what would happen to the mind-body problem if there were no such thing as the deepest level of reality, because the universe is infinitely decomposable? He argues that such a possibility would be devastating to theories of consciousness because it would undermine all traditional responses to the mind-body problem, such as physicalism, dualism, idealism and neutral monism. Attempts to rescue physicalism from such an argument do not succeed, he argues, because "Physicalism (and any alternative to it) turns out to be an unfalsifiable, unverifiable, and unstable metaphysical view" (Nagasawa, 2012b).

However, "Their failures might motivate a unique form of monism that is radically different from physicalism as commonly formulated." It leads to a "priority monism" because "It motivates us to seek fundamentality on the top, rather than on the bottom, level of reality." The main difference between priority monism and traditional microfundamentalism, Nagasawa says, is that "Priority monism regards the whole universe, rather than its ultimate components, as most fundamental. Locating the fundamental level at the top enables priority monism to secure a firm [if unusual] metaphysical ground"—because then, the totality of everything, including all that we call physical entities and mental entities, is the single fundamental entity, of which all of its components are derivative.

Nagasawa concedes that while what he has is truly a monism, with exactly one fundamental entity, it is neither monism nor dualism in the context of the mind-body problem. Rather, he suggests, it "has an affinity with monism in Eastern traditions, which regard the totality as an organic whole in which numerous entities are entangled" (Nagasawa, 2012a).

18.7. Musser's "is it really so hard?"

Science journalist George Musser explores the relationship between consciousness and physics with two explanatory arrows pointing in opposite directions. In addition to the normal using-science-to-explain-consciousness framework, he focuses on "why physicists are studying human consciousness and AI to unravel the mysteries of the universe." Must physics, to find its holy-grail "theory of everything," account for consciousness? Reciprocally, could such investigations provide new insights into physics? (Musser, 2023a,b).

Musser centers his inquiry at the intersection of fundamental physics, neuroscience, and rapidly developing AI, and after examining diverse approaches, such as neural networks and quantum computing, predictive coding and integrated information theory, he concludes with cautious optimism that we humans do have a shot at comprehending our consciousness. "There is as yet no sign that science has hit a wall," Musser says. "Our minds evolved to understand the world, which requires that the world be understandable. And we are of this world" (Musser, 2023a,b, p. 251).

Musser wants to reject the "mysterian" position of Colin McGinn, Steven Pinker, Noam Chomsky, and others, who think we might never grasp how consciousness works, even though they still have consciousness as a product of the natural, physical world, "rather than an exotic add-on" (like panpsychism) (Musser, 2023a,b, p. 240). Although he comes to no firm conclusion, Musser gives pride of place to explanations of consciousness that are "perspectival" or "relational." He approvingly quotes Carlo Rovelli (11.16) that the physical world is "a web of relations … things have no properties in isolation, but acquire them only at their point of contact with other things" (Musser, 2023a,b, p. 148). Musser then begins "to think about how qualia might be relational" (Musser, 2023a,b, p. 243).

Musser and colleagues wonder whether the exponentially-growing power of AI could, at some future point, devise or discover theories that a human mind could not, from foundations of quantum mechanics

to the essence of consciousness. Perhaps, Musser muses, "the machines will help us the most when they are their most inscrutable" (Musser, 2023a,b, p. 250). (Personally, I would find it a very large surprise if AI, however successful at predicting protein structures and checking mega-math proofs, could provide novel insight to the hard problem. AI might enjoy proving me wrong.)

18.8. Davies's consciousness in the cosmos

Physicist and polymath Paul Davies asserts the heterodox view among scientists that consciousness is something very significant in the evolution of the universe. "Although we see consciousness only in response to some set of physical systems, nevertheless it seems to me to play an absolute and fundamental role. Because at one level, all of science, our whole understanding of the universe, comes through our own consciousness. It's actually the starting point of all inquiry" (Davies, 2006b).

But what of the minuscule place of consciousness amidst the unfathomably vast universe? Davies muses: "Is consciousness on the surface of our planet just a little embellishment on the great scheme of things or does it have fundamental role? I should also say that whether it's fundamental or not, we surely have to explain it. It has got to fit into our scientific picture of the world, but I don't think we've got a clue as to how to go about it because none of the concepts from fundamental physics, like mass and momentum and charge, seem relevant at all."

With respect to whether consciousness really matters to quantum physics, Davies says that physicists are sharply split and that he himself has oscillated. "I used to think that consciousness was just getting in the way of understanding. But because I'm convinced that consciousness is a fundamental part of the universe, I'd like to find a place for it in physics. And the one place that it has been 'on again and off again' is within the realm of quantum physics. So, consciousness could enter quantum physics at the point of observation where the rules of the quantum game change as a result of that observation or measurement" (Davies, 2006b).

Davies is critical of the many-world interpretation (MWI) of the Schrödinger equation that governs the wave function of quantum mechanical systems. While MWI adherents argue they are literalists, Davies counters that "it's a way of trying to get rid of consciousness from playing a fundamental role in quantum physics." He calls MWI a "missed opportunity," because "if we're going to actually incorporate consciousness into our description of physics it's at the quantum level that we should attempt to do so."

Can one then go from consciousness at the quantum level to consciousness at the universe level, not just as metaphor but to actually explain reality? Davies focuses on the challenge of giving a cosmic significance to consciousness because, as far as we know, there are so vanishingly few conscious beings in the vast universe (Davies, 2006b, 2006c).

Davies looks to the far future of the universe. "It seems entirely possible that human beings or alien beings or any sort of conscious beings are going to spread out across the universe. We think a universe of 13.8 billion years is old; in fact, it's exceedingly young. There's no reason why it can't go on for trillions and trillions of years. There's absolutely plenty of time for it to become full of minds, full of observers. And we can imagine a time in the far, far future when mind and the universe in effect merge: they become one. And so the act of observation which at the moment is limited to maybe a little corner of the universe could saturate the whole universe. The whole universe could become self-known."

But could what might happen in the future affect what has happened in the past? Davies explains: "Part of the weirdness of quantum physics is that observations which are made now can affect the nature of reality in the past."

This is not "backward causation," he stresses, but a selection among myriad alternate possible histories, a developmental history of the universe that makes sense only in the quantum realm. This is why Davies can say that "observations made in the very far future can affect the nature of reality today and even back at the Big Bang."

Davies concludes with the grand vision: "if you buy this whole quantum physics package and you have this universe saturated by mind, saturated by observers, then indeed the whole character of the universe, including the original emergence of its laws and the nature of its states, become inextricably intertwined with its mentality, with its mindfulness" (Davies, 2006b).

19. Closer to truth views

Following are brief comments on consciousness from participants on *Closer To Truth* (arranged alphabetically). Perspectives are diverse. Quotes are from the Closer To Truth website – www.closertotruth.com.

Tim Bayne: "We're not in a position to advance theories of any detail with any degree of certainty. The science of consciousness is so immature and there are so many fundamental disputes. I think what we should be looking for are constraints on theories, and once we've got those, then we're going to be in a better position to discern the underlying theories … And there's a fundamental sense in which we don't know what we're talking about. I think we need to be honest. But we can still make progress" (Bayne, 2007).

Susan Blackmore: "What we need to do and have totally failed to do so far, is have some kind of true, nondual understanding of the world. What feels like an outside world of physical things, and what feels like an inside world of my experience—we must somehow bring these together. Physicists are trying at one level, psychologists at another, philosophers at still another … Nobody knows what consciousness is" (Blackmore, 2007).

Colin Blakemore: "The problem of brain and mind is that it's chalk and cheese. I know what a brain is. It's a physical thing; I know what it looks like, what it contains. I can see brain sections under the microscope. Then this other word, 'mind'—and we all know what that means too, in a way. But you can't put 'mind' under a microscope. We don't know what constitutes it. Mind is a useful word in dialogue but it doesn't map onto something you can study easily experimentally. So, neuroscientists have tended to simply put the concept to one side. It's not the mind we're working on; it's the brain. How much of an animal's behavior can be explained just by studying its brains? You can go a long way, a very long way" (Blakemore, 2012b).

Stephen Braude: "It's not just that I'm an anti-physicalist, I'm an anti-mechanist. I don't think we can give lower-level explanations, explanations by analysis, in terms of psychological regularities or capacities. This takes us to new ways of understanding human behavior: not as if it's emitted by a kind of behavior mechanism, but to see and understand human action as one of an indefinitely large number of possibilities in a much grander action space" (Braude, 2007b).

Hubert Dreyfus: "Nobody has any idea [about consciousness], and they should just keep quiet until they do, because I think it is the hardest question: How in the world could 'matter,' which is this third-person material stuff, ever produce consciousness? And AI and computers are not helping us understand it one bit" (Dreyfus, 2009).

Susan Greenfield: "I find unhelpful this notion that our brains are like satellite dishes, and out there floating in the ether is consciousness, which our brains pick up" (Greenfield, 2012).

Jaron Lanier: "The real drama of the question of consciousness—on which I have absolutely no insight—is the possibility of an afterlife." Post-mortem survival, Lanier says, is "the name of the game for a lot of people who concern themselves with consciousness … I think the scientific community ought not to tread on that territory unless it has something constructive to say." It's "simply dumb," he says, for scientists to tell people, "Don't believe in that." "Don't have any hope." "Don't have any faith." It's not something we have evidence about, Lanier posits, then cautions, "Make your faith disciplined so you don't get manipulated by people trying to build power bases or trying to sell silly superstitions." Lanier says that "hard attack on soft faith will

backfire and is destructive." Moreover, "ultimately it isn't honest, because many of us do feel this consciousness thing inside, and many of us wonder what it's all about on some larger level. We just don't have the tools to do anything but wonder" (Lanier, 2007a, 2007b).

Massimo Pigliucci: "The only examples we have of consciousness are biological. That doesn't mean that, in principle, it is not possible to build artificial consciousness, but we have no idea how to do it. And we don't know whether, in fact, it is even possible. This truly is an open question where I am entirely agnostic. But the fact of the matter is, in science, when you study something, you start with what you have, not with what you might know in the future. And the thing that we know about consciousness is that it is an evolved biological phenomenon based on particular substrates" (Pigliucci, 2023a,b.).

Alex Rosenberg: "I think that the available scientific evidence which drives us to atheism should also drive us to a denial of free will, to a denial of the existence of absolute fundamental ethical theories, to a physical materialism about the nature of consciousness, and to a denial that the history or trajectory of our species' existence on the planet has any particular goal, or purpose, or endpoint, or meaning" (Rosenberg, 2022.).

Eric Schwitzgebel: "I don't rule out the possibility that we're not in fact physically embodied in the way that we think we are. One possibility on my map, although not generally accepted in contemporary philosophy, is idealism. On an idealist view, minds and bodies are just kind of constructions of our minds. And so it would be misleading in a certain way to say that minds were physically embodied. It would be more like bodies are 'enminded'" (Schwitzgebel, 2014).

Gino Yu: "The Western way of thinking, the Western framing of the world, is to try to understand who or what I am by looking outward, rather than by looking inward, observing what is happening …. Trying to understand the realm of the mind intellectually is like trying to scratch an itch you cannot reach" (Yu, Gino. 2013).

Samir Zaki: "Not a single sentence written about consciousness is worth reading. There's a lot about how it's being made a subject worthy of scientific study—I don't think it will produce anything too worthwhile, actually … Philosophical problems become philosophical problems by virtue of the fact that there are no solutions to them. What new theories have been produced by consciousness? They have been negligible" (Zeki, 2019).

In addition, "Must the Universe Contain Consciousness?"—with Paul Davies, Leonard Susskind, J. Richard Gott, Saul Perlmutter, Alan Guth, Leonard Mlodinow, Christof Koch, Brian Josephson, Stuart Hameroff, Michael Shermer, and Deepak Chopra (Must the Universe Contain, n.d.).

Separately, physics-savvy filmmaker Curt Jaimungal offers a "layering" approach to consciousness, in which successive levels ("layers") of multiple theories reveal greater complexities and depth, much as he does in expounding string theory on his "Theory of Everything" podcast (Jaimungal, 2014a, 2014b). While more an epistemological framework than an ontological theory, "layering" could facilitate novel ways to think about consciousness.

Finallly, the elemental enigma of consciousness—the implicit failure of any of the myriad theories to suffice—sugggests the inconvenient idea that perhaps the whole consciousness enterprise is fundamentally flawed. For example, post-realist philosopher Hilary Lawson has reality as an "unspecified other"—which he calls "Openness"—in principle inaccessible and unknowable—and what we do is "Close" the Openness of the forever-hidden "real world" by taking parts and pieces into "our world" of things and thoughts and properties. We "Close" via language, observation and reason, which is required to engage and intervene, but in doing so we also limit or cut off untold realms of reality (Lawson, 2001). One could suppose this is what we do with consciousness.

20. Chalmers's meta-problem of consciousness

We've got one more topic. It's not *on* the Landscape. It's *about* the Landscape. It's the *meta-problem* of consciousness. David Chalmers, its originator, explains: "The meta-problem of consciousness is the problem of explaining why we think that there is a problem of consciousness." (Chalmers, 2018). While the meta-problem is not a theory or explanation of consciousness, it gives insight into the ways of thinking of leading theorists and it probes the psychosocial structure of the field.

Chalmers continues: "The meta-problem is a problem about a problem. The initial problem is the hard problem of consciousness: why and how do physical processes in the brain give rise to conscious experience? The meta-problem is the problem of explaining why we think consciousness poses a hard problem, or in other terms, the problem of explaining why we think consciousness is hard to explain." Equivalently, it is the problem of explaining why people have problem intuitions … including metaphysical intuitions ("consciousness is non-physical"), explanatory intuitions ("physical processes can't fully explain consciousness"), knowledge intuitions ("someone who knows all about the brain but has never seen colors doesn't know what it's like to see red"), and modal intuitions ("we can imagine all these physical processes without consciousness"). There are also intuitions about the value of consciousness, the distribution of consciousness, and more (Chalmers, 2018).

In a special issue of the *Journal of Consciousness Studies* dedicated to the meta-problem of consciousness, 39 colleagues respond to Chalmers. Following are several whose own theories are presented on the Landscape (*Journal of Consciousness Studies*, 2019).

Andy Clark, Karl Friston, Sam Wilkinson: "The meta-problem of consciousness is the problem of explaining the behaviours and verbal reports that we associate with the so-called 'hard problem of consciousness'. These may include reports of puzzlement, of the attractiveness of dualism, of explanatory gaps, and the like. We present and defend a solution to the meta-problem. Our solution takes as its starting point the emerging picture of the brain as a hierarchical inference engine. We show why such a device, operating under familiar forms of adaptive pressure, may come to represent some of its mid-level inferences as especially certain. These mid-level states confidently re-code raw sensory stimulation in ways that (they are able to realize) fall short of fully determining how properties and states of affairs are arranged in the distal world. This drives a wedge between experience and the world. Advanced agents then represent these mid-level inferences as irreducibly special, becoming increasingly puzzled as a result" (Clark et al., 2019).

Daniel Dennett: "David Chalmers underestimates the possibility that actually answering the 'hard question' will make both the hard problem and the meta-problem of consciousness evaporate" (Dennett, 2019).

Keith Frankish: "The meta-problem of consciousness prompts the meta-question: is it the only problem consciousness poses? If we could explain all our phenomenal intuitions in topic-neutral terms, would anything remain to be explained? Realists say yes, illusionists no. In this paper I defend the illusionist answer. While it may seem obvious that there is something further to be explained—consciousness itself—this seemingly innocuous claim immediately raises a further problem—the hard meta-problem. What could justify our continued confidence in the existence of consciousness once all our intuitions about it have been explained away? The answer would involve heavy-duty metaphysical theorizing, probably including a commitment either to substance dualism or to the existence of a mysterious intrinsic subjectivity. A far less extravagant option is to endorse the illusionist response and conclude that the meta-problem is not a meta-problem at all but the problem of consciousness" (Frankish, 2019).

Nicholas Humphrey (who offers "A Soft Landing for Consciousness"): "Problem reports result from several misunderstandings about the nature and functions of phenomenal consciousness. I discuss some philosophical and scientific correctives that, taken together, can make the hard problem seem less hard" (Humphrey, 2019).

David Papineau: "I am glad that David Chalmers has now come round to the view that explaining the 'problem intuitions' about consciousness is the key to a satisfactory philosophical account of the topic.

I find it surprising, however, given his previous writings, that Chalmers does not simply attribute these intuitions to the conceptual gap between physical and phenomenal facts. Still, it is good that he doesn't, given that this was always a highly implausible account of the problem intuitions. Unfortunately, later in his paper Chalmers slides back into his misguided previous emphasis on the conceptual gap, in his objections to orthodox a posteriori physicalism. Because of this he fails to appreciate how this orthodox physicalism offers a natural solution to the challenges posed by consciousness" (Papineau, 2019).

Galen Strawson: "Many hold that (1) consciousness poses a uniquely hard problem. Why is this so? Chalmers considers 12 main answers in 'The Meta-Problem of Consciousness' … This paper focuses on number 11, and is principally addressed to those who endorse (1) because they think that (2) consciousness can't possibly be physical. It argues that to hold (2) is to make the mistake of underestimating the physical, and that almost all who make this mistake do so because they think they know more about the physical than they do. When we see things right, we see that there is nothing in physics nor in our everyday experience of the physical that gives us any good reason to hold (2). This leaves us free to embrace the overwhelmingly strong reasons for accepting that (3) consciousness is wholly physical. The correct general response is the same as the response to wave–particle duality: acceptance without expectation of understanding" (Strawson, 2019a).

Joseph Levine: "The key to understanding both consciousness itself and addressing the meta-problem is to understand what acquaintance is and what its objects are …. First, treat conscious experience as the holding of a basic, intentional relation of acquaintance between the conscious subject and a virtual world of objects and properties. In a sense I would endorse the almost universally deplored 'Cartesian theatre' model of experience. What it is to have conscious experience, on this view, is just to stand in a primitive or basic acquaintance relation to the objects of experience …. We still need a way of making the cognitive immediacy of experience explicable in the nature of the relation between the cognitive states about acquaintance and the phenomenon of acquaintance itself. One possible line of investigation is to employ the notion of cognitive phenomenology (9.6.3, 9.6.4, 9.6.5). After all, it is when one is occurrently entertaining thoughts about one's experience that one gains knowledge of this acquaintance relation … Unfortunately …, it is unclear how our acquaintance with the contents of experience can serve as data for our theory of conscious experience" (Levine, 2019).

Chalmers responds to his respondents in-depth (Chalmers, 2020a, 2020b, 2020c). Here is how he organizes his responses. "The commentaries divide fairly neatly into about three groups. About half of them discuss potential solutions to the meta-problem. About a quarter of them discuss the question of whether intuitions about consciousness are universal, widespread, or culturally local. And about a quarter discuss illusionism about consciousness and especially debunking arguments that move from a solution to the meta-problem to illusionism … As a result, I have divided my reply into three parts, each of which can stand alone. This first part is 'How Can We Solve the Meta-Problem of Consciousness?' The other two parts are 'Is the Hard Problem of Consciousness Universal?' and 'Debunking Arguments for Illusionism about Consciousness'" (Chalmers, 2020a).

"How can we solve the meta-problem? As a reminder, the meta-problem is the problem of explaining our problem intuitions about consciousness, including the intuition that consciousness poses a hard problem and related explanatory and metaphysical intuitions, among others. One constraint is to explain the intuitions in topic-neutral terms (for example, physical, computational, structural, or evolutionary terms) that do not make explicit appeal to consciousness in the explanation … I canvassed about 15 potential solutions to the meta-problem. I expressed sympathy with seven of them as elements of a solution: introspective models, phenomenal concepts, independent roles, introspective opacity, immediate knowledge, primitive quality attribution, and primitive relation attribution …" (Chalmers, 2020a).

How does Chalmers view developments in consciousness studies since he highlighted, or ignited, the hard problem? "One thing that's really nice to see now is a lot of people are taking the problem a lot more seriously. And there has been a panoply of ideas, left and right, philosophers and scientists trying to address the problem of consciousness in a way that doesn't reduce consciousness to something else or try to deflate it, whereas in the past, all the predominant approaches were reductionist. Now, that's not the case" (Chalmers, 2016b).

As for Chalmer's own thinking, he says, "I've gradually evolved toward trying to focus on constructive theories of consciousness. For a while, it was a matter of fighting battles with materialists; I still enjoy that, but I think we're at the point where it's more worthwhile to focus on getting the details of constructive theory right. So, I've thought a lot about panpsychism, the idea that consciousness is fundamental in the universe—and how you can overcome the problems for that kind of view. I've thought about the idea that consciousness might play a role in quantum mechanics, and how that might help provide a role for consciousness in the universe. In general, although my hair has gotten shorter, my tolerance for wild ideas has gotten higher: I'm prepared to entertain all kinds of crazy ideas when it comes to a theory of consciousness. I think one thing we've learned is that we're just not going to have a good theory of consciousness without a wild idea or two in there. If you try to make it all common sense, it's just not going to work. But I think we've also learned we can be rigorous at the same time (Chalmers, 2016b).

21. Implications

That's it. The explanations and theories on the Landscape of Consciousness—currently. They will change.

As promised, I shall not adjudicate among them, rank them in some order, critique this or that. Nor, should I try, would I have much confidence in my own, idiosyncratic views.

Scanning through all of them, this blizzard of explanations and theories, I respect but resist Colin McGinn's old admonition: "The mystery persists. I think the time has come to admit candidly that we cannot resolve the mystery" (McGinn, 1989).

We go on.

That's what it means to be human.

I'm asked by viewers of *Closer To Truth* why I don't take more stands and give more answers to the big questions we pursue. I respond that if I knew, I'd tell—I'm keeping no secrets. Rather, I've learned to luxuriate in the questions, with an agnosticism that is proactive and passionate.

Now the fun part. I turn to implications of the explanations or theories of consciousness with respect to four big questions: (i) ultimate meaning/purpose/value (if any); (ii) AI consciousness; (iii) virtual immortality; and (iv) survival beyond death.

What can be said? Most must be speculative, of course, but some general principles might hold.[68]

22. Meaning/purpose/value

Under Materialism Theories (9) (philosophical, neurobiological, electromagnetic fields, computational and informational, homeostatic and affective, embodied and enactive, relational, representational, language, phylogenetic evolution), I'd be hard-pressed to rationalize any ultimate meaning or purpose, and probably no ultimate value, but recognize the humanistic meaning, purpose and value that we create for ourselves. None can explain this better than physicist Steven Weinberg. Near the end of his early book on cosmology, he wrote the indelible line, "The more the universe seems comprehensible, the more it also seems pointless" (Weinberg, 1977).

[68] Some sections are derived or adapted from my earlier article: Kuhn, Robert Lawrence. (2016a). Virtual Immortality. *Skeptic Magazine*, Volume 21, Number 2, 2016.

Some 30 years later, I asked Weinberg to reflect on his words. "Oh, I don't have any second thoughts. I do think that as we've learned more and more about the universe, we've seen that there is no point in nature. There is nothing in the laws of nature that refer to human beings. There's nothing that gives us guidance. We do not discover that we are part of a cosmic drama in which we play a central role" (Weinberg, 2006).

However, Weinberg reflected further: "But I did have a following paragraph. I said that [even] if we don't find a point in nature, we can at least make a point for ourselves. We can love each other and find beauty in things. And one of the things that gives point to some of our lives is the process of discovering nature, discovering the laws of nature. But whatever point there is, it is one that we have to give to ourselves." (I've said on *Closer To Truth* that if I were God, Steven Weinberg would be my prophet.)

By contrast, almost all Dualism (15) and Idealism (16) theories offer some kind of ultimate meaning/purpose/value (countless variations are imagined and on offer). Non-Reductive Physicalism (10), Panpsychism (13), many Monisms (14), and some Quantum Theories (11) sit in the middle, with possible ultimate meaning/purpose/value. John Leslie's theory of why there is a universe, not a blank, has "Value" as its heart (Leslie, 2013). Non-Reductive Physicalism is taken up by some Christian philosophers who see God's purpose working toward a resurrection of the dead, not toward a post-mortem heaven or hell (with no immediate state between moment of death and moment of resurrection).

While Anomalous and Altered States theories distribute their support among Dualism, Quantum, and Monism theories, they all envision an expanded reality with potential for new kinds or levels of meaning, and almost all give credence to some kind of life or state of consciousness after death.

Integrated Information Theory may be the subtlest to interpret in that while its measurement and analysis of consciousness convey no ultimate meaning/purpose/value, its speculative, innumerable nth dimensional structures, each a conscious percept, is sufficiently novel to suspend judgment.

23. Artificial intelligence (AI) consciousness

Whether artificial intelligence (AI) can be or become conscious, while long a question, has burst into public discourse—due to the sudden impact of large language models such as ChatGPT, Gemini, and others. AI consciousness has become a serious matter of global concern. The question has vast social, moral and perhaps human-species-wide consequences.

A major multidisciplinary report, bringing together AI experts, philosophers, neuroscientists and psychologists, argues for and exemplifies a rigorous and empirically grounded approach to AI consciousness. The report surveys prominent scientific theories of consciousness, all of which are on this Landscape, and derives "indicator properties" of consciousness, which are used to assess AI systems. The conclusion is that no current AI system is conscious, but that there are no obvious barriers to building AI systems that could be conscious (Butlin, 2023).

It must be stressed that the report's working hypothesis is *computational functionalism*, the thesis that performing computations of the right kind is necessary and sufficient for consciousness. The report adopts this hypothesis for pragmatic reasons: unlike rival views, it entails that consciousness in AI is possible in principle and that studying the workings of AI systems can assess whether they are likely to be conscious. Though indeed a mainstream position in philosophy of mind, computational functionalism is challenged by diverse rivals on the Landscape.

To philosopher John Searle, computer programs can never have a mind or be conscious in the human sense, even if they give rise to equivalent behaviors and interactions with the external world. In Searle's famous "Chinese Room" argument, a person inside a closed space can use a rule book to match Chinese characters with English words and thus appear to understand Chinese, when, in fact, she does not. (There is dispute about the validity of Searle's Chinese Room argument [Cole, 2023].)

Nonetheless, Searle argues that just because brain processes cause consciousness and intentionality (aboutness) does not imply that only brains can be conscious. The brain is a biological machine, and we might build an artificial machine that was conscious. Because we do not know how the brain generates consciousness, Searle says, is the reason we are not yet in a position to know how to do it artificially (Searle, 2007a, 2007b).

Rather, what Searle rejects is that a simulation of brain states, however detailed the information and precise the representation, can achieve the subjective qualities of inner awareness. What is required for consciousness, he says, is the same set or system of biological processes that the brain uses (Searle, 2002; Proust, 2003).

Will it ever be possible, with hyper-advanced technology, for non-biological intelligences to be conscious in the same sense that we are conscious? Can computers have 'inner experience'?[69]

"It's like the question, 'Can a machine artificially pump blood as the heart does?" Searle responds. "Sure it can—we have artificial hearts. So, if we can know exactly how the brain causes consciousness, down to its finest details, I don't see any obstacle, in principle, to building a conscious machine. That is, if you knew what was causally sufficient to produce consciousness in human beings and if you could have that [mechanism] in another system, then you would produce consciousness in that other system. Note that you don't need neurons to have consciousness. It's like saying you don't need feathers to fly. But to build a flying machine, you do need sufficient causal power to overcome the force of gravity" (Searle, 2007b.).

Searle cautions: "The one mistake we must avoid is supposing that if you simulate it, you duplicate it. A deep mistake embedded in our popular culture is that simulation is equivalent to duplication. But of course it isn't. A perfect simulation of the brain—say, on a computer—would be no more conscious than a perfect simulation of a rainstorm would make us all wet."

Robotics professor/entrepreneur Rodney Brooks agrees that consciousness can be created in non-biological media, but disagrees on the nature of consciousness itself. "There's no reason we couldn't have a conscious machine made from silicon," he said. Brooks's position derives from his view that the universe is mechanistic and that consciousness, which seems special, is an illusion. We "fool ourselves," he says, into "thinking our internal feelings are so unique." (Brooks, 2011).

AI expert Joscha Bach is bullish on AI consciousness, in part, because his theory (9.2.10) treats "consciousness as a memory instead of an actual sense of the present"—which he says "resolves much of the difficulty for specifying an AI implementation of consciousness: it is necessary and sufficient to realize a system that remembers having experienced something, and being able to report on that memory" (Bach, 2019).

Can we ever really assess consciousness? "I don't know if you're conscious. You don't know if I'm conscious," says neuroscientist Michael Graziano. "But we have a kind of gut certainty about it. This is because an assumption of consciousness is an attribution, a social attribution. And when a robot acts like it's conscious and can talk about its own awareness, and when we interact with it, we will inevitably have that social perception, that gut feeling, that the robot is conscious …. But can you really ever know if there's 'anybody home' internally, if there is any inner experience?" he continues. "All we do is compute a construct of awareness" (Graziano, 2014).

Inventor and futurist Ray Kurzweil believes that "we will get to a point where computers will evidence the rich array of emotionally subtle behaviors that we see in human beings; they will be very intelligent, and they will claim to be conscious. They will act in ways that are conscious;

[69] All quotes from Closer To Truth—www.closertotuth.com—unless otherwise noted.

they will talk about their own consciousness and argue about it just the way you and I do. And so the philosophical debate will be whether or not they really are conscious—and they will be participating in the debate" (Kurzweil, 2007).

Kurzweil argues that assessing the consciousness of other (possible] minds is not a scientific question. "We can talk scientifically about the neurological correlates of consciousness, but fundamentally, consciousness is this subjective experience that only I can experience. I should talk about it only in first-person terms—although I've been sufficiently socialized to accept other people's consciousness. There's really no way to measure the conscious experiences of another entity … But I would accept that these non-biological intelligences are conscious. And that'll be convenient, because if I don't, they'll get mad at me."

Physiological psychologist Warren Brown stresses "embodied cognition, embodied consciousness," in that "biology is the richest substrate for embodying consciousness." But he doesn't rule out that consciousness "might be embodied in something non-biological." On the other hand, Brown speculates, "consciousness may be a particular kind of organization of the world that just cannot be replicated in a non-biological system" (Brown, 2014).

"I am a functionalist when it comes to consciousness," says neuroscientist Christof Koch. "As long as we can reproduce the same kind of relevant relationships among all the relevant neurons in the brain, I think we will have recreated consciousness. The difficult part is, what do we mean by 'relevant relationships?' Does it mean we have to reproduce the individual motions of all the molecules? Unlikely. It's more likely that we have to recreate all the relevant relationships of the brain's synapses and the brain's wiring (the 'connectome') in a different medium, like a computer. If we can do all of this reconstruction at the right level, this entity, this software construct, would be conscious" (Koch, 2012c).

Koch stresses that "experience" requires new, perhaps radical, scientific thinking. "You need to expand the traditional laws of physics. In physics there is space, time, energy, mass. Those by themselves are sufficient to explain the physics of the brain. The brain is subject to the same laws of physics as any other object in the universe. But in addition, there is something else. There is experience. The experience of pain. The experience of falling in love. And to account for experience, you need to enhance the laws of physics."

In the context of Integrated Information Theory, would Koch be comfortable with nonbiological consciousness? "Why should I not be? Consciousness doesn't require any magical ingredient."

Over the years, Koch has refined his views. Against the grain, he says, "integrated information theory radically disagrees with this functionalist view. It argues from first principles that digital computers can (in principle) do everything that humans can do, eventually even faster and better. But they can never be what humans are. Intelligence is computable, but consciousness is not. This is not because the brain possesses any supernatural properties. The critical difference between brains and digital computers is at the hardware level, where the rubber meets the road—that is, where action potentials are relayed to tens of thousands of recipient neurons versus packets of electrons shuttled back and forth among a handful of transistors." Koch primary point is that "the integrated information of digital computers is negligible. And that makes all the difference. It means that these machines will never be sentient, no matter how intelligent they become. Furthermore, that they will never possess what we have: the ability to deliberate over an upcoming choice and freely decide" (Koch, 2024, p. 20).

Theist philosopher Richard Swinburne says, "I don't see that it is in the least implausible that a 'radically separate, non-physical substance' could come into existence as a result of a non-biological process. There might be some law of nature stating that all sufficiently complicated computer-like systems become conscious. But the problem is that the law could not state which conscious being they would become, out of the innumerable possible individual conscious beings they might become. And that, in my view, also applies to organisms produced by normal processes—there may be a law determining that a person with a certain character emerges as a result of fertilization of an egg, but the law could not determine which person that was; for the simple reason that laws deal with the causation of states of affairs of certain kinds by other states of affairs of certain kinds; and given that a duplicate of me isn't necessarily me, no law of nature could determine that I would have been born from my actual parents" (Swinburne, 2016).

Now, for each of the categories of explanations of consciousness, a conjecture: In which could AI become conscious?

Materialism Theories (9): Sure. For Materialism Theories (with all its subcategories) to be consistent, AI consciousness must be in principle absolutely sure. There is no possibility that, given materialism, AI consciousness would be forbidden. If one argues that consciousness must be embodied, fine, then materialism will build a body. Remember, we are speaking in ultimate principle, not in current practice, and there are no time limits. (Dehaene, Lau and Kouider assert that to build machines that are conscious, novel machine architectures must be based on information-processing computations similar to those of the human brain, especially global workspace and higher-order theories [Dehaene et al., 2017].)

If materialism explains consciousness entirely (without residue), then it would be certainly true that non-biological intelligences with super-strong AI would eventually have the same kind of inner awareness that humans do. Moreover, as AI would break through the singularity and become vastly more sophisticated than the human brain, it would likely express forms of consciousness higher than we today can even imagine. Though some speculatively reject that AI could ever become conscious (e.g., Reber, 2016; Reber, 2018), if one takes a hard-core physicalist position, an immutably skeptical outlook may not be warranted (and may not be coherent).

To the degree that language affects the deep essence of consciousness, this would make AI consciousness more likely, given the exponential advances in AI language development. But language per se is certainly not sufficient and likely not necessary.

Non-Reductive Physicalism (10). If Non-Reductive Physicalism is true, then it would be almost certainly true that non-biological intelligences could eventually be conscious—although the independent reality of mental states attenuates (slightly, unpredictably) the likelihood of inner awareness—an argument that is itself countered by functionalism (if functionalism is true). However, if strong emergence and top-down causation were required, then both would have to be enabled in creating AI consciousness, a process that would require two orders of complexity (i.e., strong emergence and top-down causation as real phenomena, and then their artificial creation).

Quantum Theories (11). If quantum mechanics is the key to consciousness, with its exponential amplification of processing power and its vast parallel pathways working simultaneously, Quantum Theories would be the lead category for generating AI consciousness. The one caveat, a practical but not an in-principle obstacle, would be the physical constraints of manipulating myriad quantum states, with their inherent indeterminacies and environmental sensitivities, making the technology even more daunting. However, the technology is accelerating with fervor and so if AI consciousness is to happen, by design or by default, Quantum Theories is likely how and where it will happen.

Integrated Information Theory (12). If consciousness requires an independent, non-reducible feature of physical reality—say, IIT's "qualia space"—then it would remain an open question whether non-biological intelligences could ever experience true inner awareness. (It would depend on the deep nature of the consciousness-causing feature in qualia space, and whether this feature could be controlled by technology.)

Panpsychisms (13). If panpsychism explains consciousness such that proto-consciousness is a non-reducible property of every elementary physical field and particle, then it would seem likely that AI could experience true inner awareness (because consciousness would be an intrinsic part of the fabric of reality). Panpsychism introduces more

complexity than does materialism because panpsychism must solve its combination problem (but this problem must be solved anyway in order for panpsychism to be the winning theory). In addition, AI consciousness under panpsychism turns on whether the micropsychic aspects can be manipulated by advanced technology.

Monisms (14). Monisms, almost by definition, should pose no problem for AI consciousness, as everything everywhere is the same stuff. A possible exception would be if God or something like God (if it exists) were involved.

Dualisms (15). The major holdout to AI consciousness, as I see it (at this particular moment), would be if dualism were true and consciousness requires a radically separate, nonphysical substance not causally determined by the physical world. It would then seem impossible that non-biological intelligences, no matter how super-strong their AI, could ever experience true inner awareness, at least the varieties of dualism where God or something like God was doing the creating and/or allocating. Emergent dualism, where unfathomable but conceivable psychophysical laws generate "souls" (or nonphysical components) based on certain principles of physical complexity, would be an exception and could generate AI consciousness almost as surely as materialism, though requiring this extra process.

Idealisms (16). As Idealism holds that everything everywhere is already consciousness in some primitive sense, that fundamental consciousness is ultimate reality, then anything could be (or is) conscious (whatever that may mean), including non-biological entities. However, the question turns on how fundamental consciousness would be related to personal consciousness, and if so, could even maximally advanced technology manipulate it? (Idealist philosopher Bernardo Kastrup, also a computer scientist, says "Conscious AI is a fantasy," though for reasons based mostly on current concepts of computers [Kastrup, 2023].)

Anomalous and Altered States Theories (17). Because Anomalous and Altered States theories of consciousness require "something" beyond, or in addition to, materialism, that "something" would ipso facto need to generate AI consciousness. While unknowable practically, it does not seem an insurmountable barrier conceptually. For example, it could be the case that when a system is of a sufficient kind of complexity it "automatically" taps into the "grid," as it were, of another realm of reality. Alternatively, Anomalous and Altered States theories may simply be taken, by their adherents, as evidence of Quantum, Dualism or Idealism theories, in which case the theory of choice would determine the possibility of AI consciousness.

To summarize, in assessing AI consciousness, here are my (tentative) conclusions for each category: Materialism Theories: Yes. Non-Reductive physicalism: Likely. Quantum Theories: Yes (the lead category). Integrated Information Theory: Uncertain. Panpsychism: Probably. Monism: Likely (some). Dualism: No (mostly). Idealism: Likely. Anomalous and Altered States Theories: Possibly.

I agree that after super-strong AI exceeds some threshold, science could never distinguish, not even in principle, actual inner awareness from apparent inner awareness. But I do not agree with what often follows: that this everlasting uncertainty about inner awareness and conscious experience in non-biological entities makes the question irrelevant. I think the question remains maximally relevant.

In all aspects of behavior and communications, these non-biological intelligences, such as super-strong AI robots, would seem to be equal to (or, more likely, superior to) humans. But if super-strong AI robots did not, in fact, have the felt sense of inner experience, they would be "zombies" ("philosophical zombies"), externally identical to conscious beings, but with no mental content, nothing inside. Moreover, this difference between super-strong AI being conscious and merely appearing conscious would become even more crucial if, by some objective standard, humanlike inner awareness conveys some kind of "intrinsic worthiness" with moral rights and privileges.

Consider cosmos-colonizing robots driven by super-strong AI. The stark dichotomy between conscious and non-conscious entities elicits a probative question about self-replicating robots, which, unless we destroy ourselves or our planet, will eventually colonize the cosmos. Post-singularity, would super-strong AI robots without inner awareness be in all respects as powerful as super-strong AI robots with inner awareness, and in no respects deficient? That is, are there kinds of cognition that, in principle or of necessity, require true inner felt experience?

Moreover, would conscious galaxy-traversing robots, with true inner felt experience, represent a higher form of intrinsic worthiness and absolute value? I can argue that unless our robotic probes were literally conscious, even if they were to colonize every object in the universe, the absence of inner felt experience would mean a diminished intrinsic worth, and, by extension, a diminished universe. For assessing the profound nature and value of robotic probes colonizing the cosmos, for assessing what it means to colonize the cosmos, the question of consciousness is axial.

24. Virtual immortality

Virtual immortality is the theory that the fullness of our first-person mental selves (our "I") can be uploaded with first-person perfection to non-biological media, so that when our mortal bodies die and our brains dissolve, our mental selves will live on. I am all for virtual immortality and I hope it happens (rather soon, too). Alas, I don't think it will (not soon, anyway). I'd deem it almost impossible for centuries, if not millennia. Worse, virtual immortality could wind up being absolutely impossible, forbidden in principle.

This is not the received wisdom of optimo-techno-futurists, who believe that the exponential development of technology in general, and of AI in particular (including the complete digital duplication of human brains), will radically transform humanity through two revolutions. The first is the "singularity," when AI will redesign itself recursively and progressively, such that it will become vastly more powerful than human intelligence. The second, they claim, will be virtual immortality.

Virtual immortality would mark a startling, transhuman world that optimo-techno-futurists envision as inevitable in the long run and perhaps just over the horizon in the mid run. They do not question whether their vision can be actualized; they only debate when it will occur, with estimates ranging from several decades to a century or so.

I'm skeptical. I think the complexity of the science is wildly unappreciated, and, more fundamentally, I challenge the philosophical foundation of the claim. Consciousness is the elephant in the room, though many refuse to see it. They assume, almost as an article of faith, that super-strong AI (post-singularity) will inevitably be conscious (perhaps ipso facto). They may be correct, but to make that judgment requires an analysis that is surely multifaceted and, I suspect, likely inconclusive.

Whatever consciousness may be, it determines whether virtual immortality in the strong sense of true first-person survival is even possible. That's why, here, to assess prospects of virtual immortality, I do so in the context of the Landscape's diverse categories of the explanations or theories of consciousness.

First, however, there are two other potential obstacles to virtual immortality. I consider them briefly. One is sheer complexity. What would it take to duplicate the human brain such that our first-person inner awareness, and all that it entails, would be not only indistinguishable from the original but actually identical to it?

Consider some (very) rough data for the human brain: about 86 billion neurons; 500 to 1,000 trillion synapses; about 40–130 billion glial cells (traditionally assumed limited to metabolic support for neurons, now shown also to participate in brain functions); up to 1,000 moments or "buckets" per second on every neuron for positioning action potentials (the electrical sparks of information in neurons); 50 billion proteins per neuron (some of which form memories); innumerable 3-dimensional structural forms for proteins and their geometric interactions; various extra-cellular molecules (some of which are involved in brain functions). The list goes on.

How much of all of this complexity is required for total virtual duplication such that the mental fullness of the original person can be said to exist? Who knows?

Granted, much of the brain is not needed for consciousness and its contents; much of the machinery of the brain is metabolic. The bodily control mechanisms, such as regulating breathing, heart rate and digestion would be of no value in non-biological substrates. On the other hand, several theories of consciousness suggest that bodily sense is needed for normal cognition (e.g., 9.6, Embodied and Enactive Theories).

Take all the brain data together and consider all possible combinations and permutations that work to generate the more than 100 billion distinct human personalities who have ever lived (each of whom has distinct states from moment to moment over decades of life). I hesitate to estimate the number of specifications that would be required. How could all these be accessed non-invasively, in sufficient detail, in real time, and simultaneously? The technologies exceed my imagination. But in principle, they are possible.

A second potential deterrent to virtual immortality is quantum mechanics, the inherent indeterminacies that could make creating a perfect mental duplicate problematic or even impossible. After all, if quantum events (like radioactive decay) are in principle non-predictable, how then would it be possible to duplicate a brain perfectly?

But quantum indeterminacies exist everywhere, in bricks just as well as in brains, so its special applicability to brain function, and hence to virtual immortality, is questionable. The crux of the issue is at which level in the hierarchy of causation, if any, does quantum mechanics make necessary contributions to brain function and to consciousness? (11). Certainly, the vast majority of neuroscientists think quantum mechanics works only at bedrock levels of fundamental physics, way too low to play any special role at the higher levels where brains function and minds happen.

This means that while the sheer complexity of the brain would deter virtual immortality, and the indeterminacy of quantum mechanics might be an insurmountable obstacle to perfect duplication, the former would only delay its advent while the latter is probably not relevant. This leaves theories of consciousness—that same elephant in the room—which optimo-techno-futurists ignore as they plan their virtual afterlife.

This section on Virtual Immortality follows from the previous section on AI Consciousness. It is my conjecture that unless humanlike, first-person inner awareness can be created in AI-empowered non-biological intelligences, uploading one's neural patterns and pathways, however complete, could never preserve the original, first-person mental self (the private "I") and virtual immortality would be impossible. To the extent that the case for AI consciousness can be made, the case for virtual immortality strengthens. To the extent that the case for AI consciousness is weak, the case for virtual immortality weakens. AI consciousness is a necessary but not sufficient condition for virtual immortality. In other words, virtual immortality requires the same basic conditions as does AI consciousness, but then must add (unknown) orders of magnitude of greater constraints and complexity.

What about well-known thought experiments where each neuron is replaced, one at a time, by silicon chips that are perfect replicators. Everyone would agree that replacing one neuron (of 86 billion) would not change phenomenal consciousness. What about replacing one billion neurons? Ten billion? All of them? Would consciousness gradually fade and wink out? Or disappear all at once (unlikely)? Or not change at all?

John Searle, who also used the silicon chip replacement thought experiment, thinks that "as the silicon is progressively implanted into your dwindling brain, you find that the area of your conscious experience is shrinking, but that this shows no effect on your external behavior" (Searle, 1992). David Chalmers, who uses "fading qualia" to probe consciousness, thinks silicon replacement would not change phenomenology (Chalmers, 1995a). Michael Tye, who offers four possibilities for what could happen to both phenomenology and belief, thinks that neither would change (Tye, 2019). Ned Block thinks phenomenology depends on the nature of our biological machinery (Block, 2023). I think theory of consciousness matters.

In my view, the silicon replacement thought experiment poses another hurdle for virtual immortality. Unless Chalmers and Tye are correct that there would be no change, virtual immortality would be impossible.

Philosopher of mind and AI Susan Schneider warns would-be mind uploaders that "If one opts for patternism, enhancements like uploading are not really 'enhancements'; they can even result in death." Patternism, she says, is based on the computational theory of mind (9.4), which explains "cognitive and perceptual capacities in terms of causal relationships between components, each of which can be described algorithmically." One common metaphor is that "the mind is a software program: That is, the mind is the algorithm the brain implements." Upload the software, you upload the mind? Not so fast. Personal identity, Schneider says, requires "spatiotemporal continuity," such that any uploaded entity would not be your first-person self. It would be an "android," she says, "an unwitting imposter." (Schneider, 2019a, 2019b).

According to Christof Koch, "Mind-uploading will only be achievable if computational functionalism, the metaphysical assumption that computations, executed on a computer, are sufficient for consciousness, holds. In this view, consciousness is simply a question of discovering the right algorithm. Under a different metaphysical assumption, consciousness cannot be achieved by mere computation as it is a structure associated with the physics of complex systems. If this is how reality is structured, then uploading a 'mind' to a digital computer will end up with a deep fake: all action without what we hold most precious, subjective experiAs noted, virtual immortality ence" (Koch, 2024, p. 19; 12).

As noted, virtual immortality is a large leap beyond AI consciousness, in that AI consciousness creates a new locus of consciousness whereas virtual immortality must not only create a new locus of consciousness, it must also reproduce with exquisite perfection a prior locus of consciousness. This is why virtual immortality would require far more advanced technology, the acquisition of which could take centuries if not millennia or longer.

Whether virtual immortality is even possible has never changed, of course; always it has been determined or constrained by the unchanging, actual explanation or theory of phenomenal consciousness. We assess for each category.

Materialism Theories (9). If Materialism Theories explain consciousness entirely (without remainder), then our first-person mental self would be uploadable and virtual immortality would be attainable. The technology would take hundreds or thousands of years—not decades as optimo-techno-futurists expect—but, barring human-wide catastrophe, virtual immortality would happen. There is no in-principle prohibition.

If epiphenomenalism is true, then it is highly likely that virtual immortality would be attainable. The inert "foam" of consciousness should have little impact.

To the degree that Language affects the deep essence of consciousness would make Virtual Immortality more likely, given the exponential advances in AI language development—but it would still be only a first step.

Relational and Representational Theories, if true, could guide research and facilitate the technology for virtual immortality.

Non-Reductive Physicalism (10). If Non-Reductive Physicalism explains consciousness, then it is also highly likely that virtual immortality would be attainable. The causative power of mental states should not affect virtual immortality because a perfect duplication of the physical states would ipso facto produce a perfect duplication of the mental states. But if there were some strong emergence and/or top-down causation required, then those would also have to be duplicated in the upload.

Quantum Theories (11). If Quantum Theories are the mechanism of consciousness, then it is likely that virtual immortality would be attainable, because quantum mechanics is governed by highly predictable regularities, although the technology to do so would be more challenging. However, the indeterminacies, intrinsic probabilistics and strangeness of quantum physics add a degree of uncertainty that cannot be evaluated. The test, as with all potential causes of consciousness, is whether advanced technology can manipulate and control the cause of consciousness, and do so comprehensively and precisely and without meaningful error. The quantum nature of consciousness, if true, would introduce unpredictability and perhaps undermine perfect duplicability. For this reason, quantum theories, compared to other theories of consciousness, would have relatively less success in enabling virtual immortality than in generating AI consciousness (which is not to say it can do either).

Stuart Hameroff thinks it is possible that "your consciousness can be downloaded into some artificial medium as the singularity folks have been saying for years, but without any progress whatsoever." Referencing his and Roger Penrose's Orch OR theory of quantum conscious (11.1), Hameroff says, "It could happen in an alternative medium that has the proper properties," he said, "perhaps artificial nanotubes made of carbon fullerenes. [Creating consciousness in non-biological media] can be done as long as you have enough mass superposition to reach threshold in a reasonable time" (Hameroff et al., 2024).

Integrated Information Theory (12). If phenomenal consciousness requires an independent, non-reducible feature that may take the form of a radically new structure or organization of reality, perhaps a different dimension of reality—as IIT postulates—then virtual immortality could be possible, but it would be remain an open question whether our first-person mental self could be uploaded. As we do not understand this consciousness-causing structure, we could not now know whether it could be manipulated by technology, no matter how advanced. If this qualia space could be directed by activities in the brain, with predictable regularities, then virtual immortality would be more likely.

Whereas many neuroscientists assume that whole brain duplication can achieve, ultimately, virtual immortality, Tononi and Koch do not grant to a digital simulacrum the same consciousness we grant to a fellow human. According to IIT, they say, "this would not be justified, for the simple reason that the brain is real, but a simulation of a brain is virtual." Consciousness is a fundamental property of certain physical systems, those that require having real cause–effect power, specifically the power of shaping the space of possible past and future states in a way that is maximally irreducible intrinsically." Therefore, they conclude, "just like a computer simulation of a giant star will not bend space–time around the machine, a simulation of our conscious brain will not have consciousness" (Tononi and Koch, 2015). What would most likely happen, Tononi says, is, "you would create a perfect 'zombie'—somebody who acts exactly like you, somebody whom other people would mistake for you, but you wouldn't be there" (Tononi, 2014c).

Panpsychisms (13). If Panpsychism is true and consciousness is an irreducible property of each and every elementary physical field and particle, then it would seem probable that our first-person mental self could be uploaded. There would be two reasons: (i) consciousness would be an intrinsic part of the fabric of reality, and (ii) there would be regularities in the way particles would need to be aggregated to produce consciousness—and if there are such regularities, then advanced technologies could learn to control them. But the question turns, again, on whether the micropsychic forces could be harnessed and manipulated by super-advanced technology, as can physical forces of fundamental physics (with varying degrees of difficulty and precision).

Monisms (14): As with AI consciousness, monism's single-stuff reality should enable virtual immortality—again, unless God or something like God (if it exists) were involved.

Dualisms (15). If Dualism is true and consciousness requires a radically separate, nonphysical substance not causally determined by the physical world, then it would seem impossible to upload our first-person mental self by duplicating the brain, because a necessary cause of our consciousness, this nonphysical component, would be absent. (An exception, again, would be Emergent Dualism [15.9], where unknown psychophysical laws would generate "souls" or nonphysical components "automatically." But whether the same radically-unknown psychophysical laws would work equally well for virtual consciousness as for brain-based consciousness is a further complexity.)

Idealisms (16). If consciousness is ultimate reality, then consciousness would exist of itself, primitive, without any physical prerequisites. But would the unique, comprehensive pattern of a complete physical brain (derived, in this case, from consciousness) favor a duplication of a specific segment of the cosmic consciousness (i.e., our unique first-person mental self)? It's not clear, in Idealism's case, whether uploading would make much difference (or much sense). But, again, like AI consciousness under Idealism, virtual immortality under Idealism would turn on whether hyper-technology, maximally advanced, could harness and manipulate Idealism's fundamental consciousness. I can argue both sides: on the one hand, we are already composed of the same consciousness, so duplication is facilitated; on the other hand, the probability of being able to manipulate fundamental consciousness does not feel high.

Anomalous and Altered States Theories (17). As with AI consciousness, because Anomalous and Altered States theories of consciousness require "something" beyond, or in addition to, materialism, that "something" would be necessary but not sufficient to enable virtual immortality. However, given that almost every Anomalous and Altered States theory of consciousness already has ample (theoretical) resources to provide its own form or forms of immortality (supposedly), virtual immortality under Anomalous and Altered States theories would seem moot. After all, if you get the "real thing," why worry about "virtual?"

To summarize, in pursuit of virtual immortality, here are my (tentative) conclusions for each category of theories of consciousness. Materialism Theories: Yes. Non-Reductive Physicalism: Likely. Quantum Theories: Probably (with uncertainty). Panpsychism: Probably. Monism: Likely (some). Dualism: No (mostly). Idealism: Likely. Anomalous and Altered States theories: Not needed.

Any theory, of course, would need to take on board all the brain-based complexities noted earlier, much underappreciated by optimo-techno-futurists.

In trying to distinguish among these alternative theories of consciousness, and thus assess the viability of virtual immortality, I am troubled by a simple observation. Assume that a perfect duplication of my brain does, in fact, generate my first-person consciousness—which is the minimum requirement for virtual immortality. This would mean that my first-person self and personal awareness could be uploaded to a new medium (non-biological or even, for that matter, a new biological body). But here's the problem: If "I" can be duplicated once, then I can be duplicated twice; and if twice, then an unlimited number of times.

What happens to my current first-person inner awareness? What happens to my "I"? Assume I do the duplication procedure and it works perfectly—say, five times. Where is my first-person inner awareness located? Where am I? Each of the five duplicates would state with indignant certainty that he is "Robert Kuhn," and no one could dispute any of them. (For simplicity of the argument, physical appearances of the clones are neutralized.) Inhabiting my original body, I would also claim to be the real "me," but I could not prove my priority. (David Brin's novel *Kiln People* is a thought experiment about "duplicates," and personal identity [Brin, 2003].)

I'll frame the question more precisely. Compare my inner awareness from right before to right after the duplication process. Will I, the original, feel or sense differently? Here are four duplication scenarios, with their implications:

1. I do not sense any difference in my first-person awareness. This would mean that the five duplicates are like super-identical

twins—they are independent conscious entities, such that each, after his creation, begins instantly to diverge from the others. This would imply that consciousness is the local expression or manifestation of a set of physical factors or patterns. (An alternative explanation would be that the duplicates are zombies, with no inner awareness—a charge, of course, they would angrily deny.)

2. My first-person awareness suddenly has six parts—my original and the five duplicates in different locations—and they all somehow merge or blur together into a single conscious frame, the six conscious entities fusing into a single composite (if not coherent) "picture." In this way, the unified effect of my six conscious centers would be like the "binding problem" on steroids.[70] This could mean that consciousness has some kind of overarching presence or a kind of supra-physical structure.
3. My personal first-person awareness shifts from one conscious entity to another, or fragments, or fractionates. These states are logically (if remotely) possible, but only, I think, if consciousness would be an imperfect, incomplete expression of evolution, devoid of deep grounding.
4. My personal first-person awareness disappears upon duplication; although each of the six (five plus original) claims to be the original and really believes it, in fact none is. (This, too, would make consciousness even more mysterious.)

For my money (or my life), I'd bet on Scenario 1. But if Scenario 1 is correct, then have "I," the original "I," achieved virtual immortality? No. I have a bunch of super-identical twins, an enlarged family, but no virtual immortality for "me."

Suppose, after the duplicates are made, the original (me) is destroyed. What then? Almost certainly my first-person awareness would vanish, although each of the five duplicates would assert unabashedly that he is the real "Robert Kuhn" and would advise, perhaps smugly, not to fret over the deceased and discarded original.

There's a further implication of virtual immortality, and an odd one, relating to the possibility that super-strong AI, cosmos-colonizing robots could become conscious (see previous section). I can make the case that such galaxy-traveling, consciousness-bearing entities could include you—yes, you!—your first-person inner awareness exploring the cosmos virtually and (almost) forever. Here's the argument. If AI consciousness and virtual immortality are possible, then human first-person consciousness and personality can be uploaded (ultimately) into space probes and *we ourselves* can colonize the cosmos!

If virtual immortality is possible, I'd see no reason why we couldn't choose where we would like our virtual immortality to be housed, and if we choose a cosmos-colonizing robot, we could experience the galactic journeys through robotic senses (while at the same time enjoying our virtual world, especially during those eons of dead time traveling between star systems).

At some time in the (far) future, scientists will likely assure us that the technology is up and running. If I were around, would I believe the scientists and upload my consciousness? Moreover, entranced by what I assume will be AI-enhanced commercial advertisements, would I select a cosmos-colonizing robot as my medium of storage so that I could spend my virtual immortality touring the galaxy? I might, if only I'd be confident that a theory of consciousness that allows duplication is true and that the duplication procedure would not affect my first-person mental self one whit. (I sure wouldn't let them destroy the original, though the duplicates may call for it.)

So, while all the duplicates wouldn't feel like me (as I know me), I'd kind of enjoy sending "Robert Kuhn" out there exploring star systems galore.

[70] The binding problem asks how our separate sense modalities like sight and sound come together such that our normal conscious experience feels singular and smooth, not built up from discrete, disparate elements.

There's more. If my consciousness is entirely physical and can be uploaded without degradation, then it can be uploaded without degradation to as many cosmos-colonizing robots as I'd like—or can afford. It gets crazy. Which makes me think there is something irreparably wrong with duplicates in specific and perhaps with virtual immortality in general.

Whether non-biological entities such as robots can be conscious, or not, presents us with two disjunctive possibilities, each with profound consequences. If robots can never be conscious, then there may be a greater moral imperative for human beings to colonize the cosmos. If robots can be conscious, then there may be less reason for humans, with our fragile bodies, to explore space—but your personal consciousness could be uploaded into cosmos-colonizing robots, probably into innumerable such galactic probes, and you yourself (or your mental clones) could colonize the cosmos.

My intuition, for what it's worth, is that it's all a pipedream. I deem virtual immortality for my first-person inner awareness to be not possible as a practical matter (given any hyper-technology), and perhaps to be never possible in principle. Does this commit me to a form of dualism? I'm not comfortable with the pigeonhole. But confident in my conclusion, I am not.

While in the (far) future, we may find a way to convince ourselves that duplication really works, for me for now, I'm convinced of only this: Virtual immortality, like AI consciousness, must face the explanations and theories on the Landscape of Consciousness.

25. Survival beyond death

This section is somewhat repetitive. The reason is not just because there is absence of real knowledge about survival beyond death, which is obvious (to some), but also because what follows from each explanation or theory of consciousness with respect to survival is reasonably clear (even if, in some cases, ambiguous).

Materialism Theories (9). Death of the brain and body is death of the person, irrevocable and permanent non-existence. The conventional-wisdom way to maintain post-mortem, first-person subjectivity under Materialism Theories would be virtual immortality via hyper-advanced technology (see the previous section). Another possibility comes from the four-dimensional block universe interpretation of fundamental physics (the fourth dimension being time). As Albert Einstein wrote to the family of his friend, Michele Besso, who had just died: "Now he has departed this strange world a little ahead of me. That signifies nothing. For us believing physicists, the distinction between past, present and future is only a stubbornly persistent illusion."

Generic Subjective Continuity (9.8.13). Naturalistic conceptions of consciousness, personhood, and self, tied to a physicalist picture of consciousness dependent on the brain, would seem to make it impossible, even ludicrous, to sustain the hypothesis that one's particular personal consciousness survives the dissolution of the brain upon death. Nevertheless, some (Clark, T., 1994) have proposed that at death we should anticipate not the onset of oblivion or nothingness, but the continuation of consciousness—however, not in the context of the person who dies. Such "generic subjective continuity" suggests that consciousness, albeit tied to specific physical instantiations, never finds itself absent. One might stretch to find resonances with aspects of some Eastern eschatologies. (That this may or may not be welcomed by those facing death—many of whom have the hope of first-person-continuity life after death, and some of whom may prefer the onset of oblivion, not the continuation of experience in other contexts—is way beyond the scope of this Landscape.)

Non-Reductive Physicalism (10). Whereas death under Materialism/physicalism means total extinction of mind and consciousness, under some forms of Non-Reductive Physicalism, with mind not reducible, it is possible that God (if there is a God), or something like God, could bring the person back to life, a radical process often labeled "resurrection" (10.3).

Quantum Theories (11). If consciousness comes about via specialized quantum processes, then, at least superficially, death is still death as it is in materialism. However, looking deeper, the strange, counterintuitive nature of quantum theory introduces the possibility of radically new levels or realms of existence, such as the many-worlds interpretation and alternative world histories selected by future events. It is still hard to imagine how any of this could provide first-person survival beyond death to my inner "I" that feels and senses now.

Integrated Information Theory (12). If phenomenal consciousness requires a radically new structure or organization of reality, perhaps a different dimension of reality, then what happens to these inscrutable things cannot be imagined and their potential permanence in some sense cannot be rejected. This does not mean that IIT espouses or even allows life after death. What it does is highlight the mystery and importance of consciousness, which leaves the door to survival perhaps a crack more open.

Panpsychisms (13). If all aspects of the world are infused with consciousness, then solving the combination problem—how myriad microscopic panpsychic elements coalesce to form a macroscopic consciousness—could enable novel ideas about what may happen when the process reverses, when the macroscopic consciousness dissolves with the dissolution of the brain. It seems a long-long shot to first-person survival, but for some kind of survival, not in principle impossible.

Monisms (14). Having one kind of fundamental stuff makes ultimate reality simpler, suggesting perhaps that some kinds of monism may facilitate survival. For example, John Polkinghorne's "dual-aspect monism" enables a resurrection.

Dualisms (15). With its nonphysical soul or spirit independent of the body being the "real you," dualism provides the clearest mechanism for survival beyond death. As such, dualism dominates religious traditions and spiritual systems. In addition to *resurrection* (Abrahamic religions of Judaism, Christianity, Islam) and *reincarnation* (Eastern traditions, especially Hinduism and Buddhism), the vast majority of religious believers are sure that our individual soul or first-person awareness will, post-mortem, immediately be resident in some other realm. Popularity does not make truth, of course, but it is a data point. To reflect on dualism in reverse: If we knew counterfactually that survival beyond death was indeed a true fact of the world, we would likely infer that some kind of dualism is making it happen.

Idealism (16). Idealism allows survival beyond death because if everything fundamentally is consciousness, and thus consciousness is the ground of all being, then a nexus between our individual consciousnesses and the ultimate or cosmic consciousness can be readily imagined. (Parsimony is nice but not dispositive.) Indeed, Eastern religions have survival as fundamental doctrine, usually in forms and systems of reincarnation. However, survival under Idealism usually does not mean survival of one's current first-person awareness, but rather some kind of consciousness expansion (Kastrup, 2016a,b) or diffusion, like a person's one drop of personal consciousness absorbed back into the infinite ocean of cosmic consciousness from which it came. The issue of the afterlife in Indian philosophy is framed sharply by the question whether we will "eat sugar" (maintain our first-person identity) or "be sugar" (absorbed back into cosmic consciousness, lose our first-person identity) (Medhananda, 2023).

Anomalous and Altered States Theories (17). Survival beyond death of personal consciousness in some form is a prime feature of Anomalous and Altered States theories. Almost all categories of psi/paranormal (i.e., NDEs, OBEs, ESP, parapsychology, past lives) have "life after death"—if not as its central doctrine (which some do), then at least as a major aspect. Whether "communicating" with dead relatives in séances or "remembering" past lives via hypnosis, survival gets attention. In fact, survival is a main motivating reason why people are attracted to psi/paranormal phenomena in the first place.

To summarize, in pursuit of survival beyond death, here are my (tentative) conclusions for each category of theories of consciousness: Materialism: No, with possible exceptions for virtual immortality and a four-dimensional block universe. Non-Reductive physicalism: Unlikely (possible exception: resurrection). Quantum Theories: Maybe (even if so, it would be in formal, abstract ways of uncertain meaning). Panpsychism: Unlikely (long shot). Monism: Unlikely (possible exception: resurrection). Dualism: Yes, with first-person consciousness preserved. Idealism: Yes, with first-person consciousness blurred or banished. Anomalous and Altered States theories: Yes. Generic subjective continuity: No, but consciousness survives death in a generic, not a personal sense.

I remain eagerly though skeptically open to speculation. I won't fool myself.

26. Reflections

When I did my PhD in neurophysiology (mid-1960s), I felt somewhat embarrassed, as an apprentice scientist, to be seen taking consciousness seriously. I'm now proud of it, though it's no longer risky. There is today great interest in consciousness among scientists—some, in context of AI potentially becoming conscious, calling the issue "urgent" (Lenharo, 2024).

I appreciate Christof Koch pioneering neural correlates of consciousness; David Chalmers challenging conventional wisdom in philosophy of mind; and John Leslie, from whom I've learned much, showing me new ways to think about ultimate matters. I admire two physicists who have long taken consciousness seriously. Paul Davies suspects that the universe is "about" something and that consciousness is no accident. Andrei Linde was advised to take the word "consciousness" out of a cosmology manuscript so that fellow scientists wouldn't lose respect for him. Andrei responded, "If I take 'consciousness' out, I'd lose respect for myself."

Artist/philosopher Mariusz Stanowski, on seeing an early pre-proof of this paper, challenged my statement that "whatever the ultimate explanation of consciousness, it is somewhere, somehow, embedded in this Landscape of theories." He argues that "creativity is producing coherent structures/syntheses as opposed to producing collections. Your article is such a collection of views on consciousness and your comment doesn't change that. The solution lies outside this landscape." (Stanowski's own "theory of contrasts" offers "direct contact with reality" where coherent structures are built from simple elements, gradually increasing in complexity," such that "complexity means integration, value and goodness" [Stanowski, 2021]).

To be clear, I am *not* saying that the ultimate theory is already here on the Landscape, hidden in plain sight, but rather whatever the ultimate theory turns out to be, its fundamental elements could be categorized according to Landscape structure, with family resemblances to some current theories.

I turn again to Jerry Fodor and his pithy appraisal of consciousness theories: "Nobody has the slightest idea how anything material could be conscious. Nobody even knows what it would be like to have the slightest idea about how anything material could be conscious" (Fodor, 1992).

Scanning the Landscape, I'd like to say we have progressed. I'm not sure I can.

Those who write about consciousness like to quote, with bemused irony, psychologist Stuart Sutherland's cautionary words: "Consciousness is a fascinating but elusive phenomenon; it is impossible to specify what it is, what it does, or why it evolved. Nothing worth reading has been written on it" (Sutherland, 1989).

Slyly, we all hope to be the exception. More likely we corroborate that Sutherland had us all nailed.

Philosopher William Hirstein is more optimistic. In response to the early Landscape pre-proof, he noted, "You cast a broad net (you even caught me!), which is exactly what's needed at this point. Also, taken all together, it [Landscape] provides a fascinating look at the whole of human intelligence coming up against a problem, one that is vital for us. The diversity of these views is part of a larger point that, as a species,

diversity is our strength: we each tackle problems in our unique ways, and (hopefully) someone will win the lottery. Moreover, a goodly percentage of the views are inter-consistent: just touching different parts of the same elephant" (Hirstein, 2024).

Me, I just don't know … My own hunch, right here, right now—if I'm coerced to disclose it and for what little it's worth—might be something of a Dualism-Idealism mashup.[71] (I can describe; I dare not defend.)

Note to readers

Feedback is appreciated, critique too—especially explanations or theories of consciousness not included, or not described accurately, or not classified properly; also, improvements of the classification typology.

I look forward to providing updates and making revisions. This Landscape of Consciousness is a work-in-process—permanently.

Declaration of competing interest

None.

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[71] Second place might go to some form of Quantum Consciousness, triggered by writing this paper and surprising me. Third place, counterintuitively, to a kind of Eliminative Materialism/Illusionism, combined with Neurobiological and Representational Theories.

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