

The Woke World: A Panpsychist Manifesto

(Draft Only)

November 29, 2017

The world is awake. That can stand as a slogan for *panpsychism*: the view that I will understand here as holding that consciousness is fundamental and ubiquitous in nature. This does not mean that everything is conscious. Whether a particular non-fundamental entity is conscious will depend upon the arrangement of its fundamental constituents given some presumed laws of ‘mental chemistry’¹ which govern the emergence of complex forms of consciousness. So in bare outline panpsychism presents a familiar picture of fundamental features interacting in ways to generate more complex forms. Nor does panpsychism entail that sophisticated, high level consciousness is ubiquitous. The term ‘consciousness’ is notoriously hard to define and the victim of multitudes of more or less well motivated (re)definitions. I aim for a minimal conception. For contrast, compare this expansive notion of consciousness, plucked merely for illustrative purposes from Aaronson (2016): ‘displaying intelligent behavior (by passing the Turing Test or some other means) might be thought a necessary condition for consciousness’. On the minimal conception, consciousness does not at all require that ability to pass the Turing test. Feeling pain (or any other sensation) alone is sufficient for consciousness. It’s worth noting this because there is a somewhat pernicious ambiguity lurking here, that between a property and the evidence we have for ascribing it. Although still inaccurate, Aaronson’s dictum is closer to the truth if we change the final phrase to ‘a necessary condition for the ascription of consciousness’. But note that we can have *theoretical* reasons for ascribing a property without there being any direct observational evidence for the ascription. So, the kind of minimal consciousness in question is not ‘self-consciousness’ or ‘transcendental subjectivity’, or awareness of the self as a subject, or awareness of one’s own mental states, or the ability to conceptualize one’s own mental states as such. Consciousness is simply sentience, or the way things are present (to the mind).

It is undeniable that panpsychism is intuitively implausible. It is frequently subject to derision by philosophers, being labeled ‘absurd’ (Searle 2013) and ‘ludicrous’ (McGinn 1999, p. 97). Even sympathizers have qualms. Thomas Nagel worries that panpsychism carries the taint of ‘the faintly

¹This term goes back to John Stuart Mill (see 1843/1963, pp. 108-9); see also Nagel (1979).

sickening odor of something put together in the metaphysical laboratory’ (1986, p. 49). Such denigrations stem from a certain confidence – misplaced I think – in our pre-existing conception of the nature of the physical world and a rather strange lack of confidence in our conception of subjective consciousness. We think we know what matter is, and we think we thereby know that it just is *not* the kind of thing which is or could be intrinsically conscious. In fact, though commonplace the former belief is demonstratively mistaken² which leaves open the status of the latter claim.

In the face of this natural antipathy, consideration of the philosophical advantages of panpsychism is the best way for it to gain sympathy. The primary motivator for panpsychism is the problem of consciousness. Over the last fifty years we have witnessed staggering advances in our knowledge of the brain and our ability to observe it in action. As we enter into the search for the elusive neural correlates of consciousness there are truly remarkable developments in mapping the relations between states of consciousness and neural activity.

Perhaps the most astonishing example of our growing knowledge, which is now underpinning practical clinical interventions, is the work of Adrian Owen, who investigates people diagnosed as being in a profound vegetative state. Such patients are incapable of making any overt behavioral response which could signal residual consciousness and have been regarded as completely unconscious. Owen has found that a disturbing number of such patients are in fact ‘locked in’ – fully conscious but cut off completely from their bodies. Using real-time functional MRI, Owen is able to interact with supposedly vegetative subjects by asking them to imagine various activities, such as playing tennis, or walking around their home. It is possible to identify the (no doubt partial) neural correlates of what the subject is imagining and thus open up a channel of communication. Owen is currently working on non-MRI solutions which patients will be able to use outside his laboratory, perhaps even at home³. This is what we can do now. There is little doubt that our ability to discover and track neural correlates of conscious states will expand enormously over the next decades.

Nonetheless, the infamous ‘explanatory gap’ (see Levine 1983) between the physical states of

²This is not a new thought. In one form or another it dates back at least to 19th century writers such as Ernst Mach and William James, and in the early 20th century to Bertrand Russell and Arthur Eddington. The basic idea that the nature of matter is not obvious just from our daily interactions with material objects forms the core of Noam Chomsky’s intriguing but somewhat obscure views on the mind-body problem, seemingly leading to Chomsky requiring/expecting a physical-science revolution before consciousness can be understood as a natural phenomenon (see 2000, ch. 4). The staunch anti-panpsychist John Searle sometimes also suggests the need for a revolution in science in order to understand how consciousness is a ‘biological phenomenon’, likening the situation to that of physics prior to the introduction of the electromagnetic field (1992, pp. 101 ff.). Searle’s claim that there is no special problem of consciousness because of the ‘biological powers’ of the brain has always struck me as, therefore, rather strange and one wishes he would explain, not in the details which can be left to science, but just the general mechanism of emergence by which the biological generates consciousness which would then reveal to us where to look for the neurological details. There is considerable recent work devoted to understanding the nature of the physical (see e.g. Montero 2009, Wilson 2006) and much current interest in the associated doctrine of Russellian Monism (see e.g. Alter and Nagasawa 2015).

³Owen has written a beautiful and fascinating popular exposition of his work entitled *Into the Gray Zone* (2017); a scholarly presentation of methods and results can be found in Owen (2008).

the brain and consciousness remains. Finding neural correlates does not show us how the brain manages to generate or realize consciousness and thereby solve David Chalmers's 'hard problem' (see his 1995, 1996). It seems likely that we will in the near future discover deeper and much more specific neural signatures of conscious states, perhaps involving neural synchronization or distinctive neural or sub-neuron dynamical activity associated with consciousness. That too won't reveal how consciousness is produced by the brain: these mechanisms are only more fine grained correlations. There is a problem of principle here.

Why is that? As hinted above, the core of the problem is the apparent mismatch between the nature of the physical world as we understand our fundamental theories to have revealed and the subjective, 'what it is like' aspect of minimal conscious experience. It feels like something to be awake and this just seems utterly foreign to how we regard and, for many, how we *ought* to regard the material world.

I take it that physics provides our scientific understanding of that world at the most fundamental level. However, its theories are perpetually provisional and the more or less background metaphysical pictures which they both suggest and spring from have a distressing history of being radically overturned by those of newer theories. And yet it is undeniable that we have accumulated knowledge. This is possible because the metaphysical picture which lurks within or behind our physical theories is not essential to their use and need not be preserved across scientific revolutions, even as explanatory and predictive power is retained and expanded. What is preserved is the relational or structural systems which physical theory maps out and by which it is confirmed and becomes predictively successful⁴. These structures are all, ultimately, relations between observable quantities for which we have labels such as 'mass', 'electric charge', 'momentum' etc, all definable in terms of observable *motion*. Over centuries of development, physical theory has become successively more complex (for example, many kinds of charge beyond that of electric are now recognized) but all new hypotheses link to the relations between observable quantities, albeit sometimes indirectly.

It is unsurprising that nowhere in this system do we find subjectivity, nor in the development of physics is there any need to posit a subjective aspect to nature. The explanatory gap is exactly the problem of how a world which is supposed to be completely described at the fundamental level by a science which has no place or need for subjectivity nonetheless somehow includes the subjective aspect of the world we call 'consciousness'.

The problem has been recognized for a very long time. In 1714 Leibniz expressed it with his 'mill argument' in the *Monadology*:

Imagine there were a machine which *by its structure* produced thought, feeling, and perception. We can imagine it as being enlarged while maintaining the same relative proportions, to the point where we could go inside it, as we would go into a mill. But

⁴For philosophical discussion of scientific structuralism, the doctrine that science provides only knowledge of structural or relational features of reality see French (2014).

if that were so, when we went in we would find nothing but pieces which push one against another, and never anything to account for a perception . . . perception, and everything that depends on it, is inexplicable by mechanical principles . . . (1714/1989, p. 215, my emphasis).

Note that Leibniz makes the anti-structuralist point that the causal organization of the mill, or the brain, cannot provide an explanation of the appearance of consciousness even if it is correlated with it⁵.

Leibniz was targeting the so-called ‘mechanical philosophy’ which, roughly speaking, asserted that the material world was, as Newton put it, such that ‘God in the Beginning form’d Matter in solid, massy, hard, impenetrable Particles, of such Sizes and Figures, and with such other Properties, and in such Proportion to Space, as most conduced to the End for which he form’d them’ (1730/1979, Query 31). Of course, Newton did not stop with this characterization but left the strict mechanical view behind by adding that ‘these Particles have not only a *Vis inertiae*, accompanied with such passive Laws of Motion as naturally result from that Force, but also that they are moved by certain active Principles’. Gravity is but one example of what he also called ‘Powers, Virtues, or Forces’⁶ and Newton expected a scientific chemistry to emerge in time based upon them.

A philosophically purified version of mechanism was much later articulated by C. D. Broad which can stand as the mechanistic ideal, whose essence is:

- (a) a single kind of stuff, all of whose parts are exactly alike except for differences of position and motion;
- (b) a single fundamental kind of change, viz, change of position. . . .
- (c) a single elementary causal law, according to which particles influence each other by pairs . . .
- (d) a single and simple principle of composition, according to which the behavior of any aggregate of particles, or the influence of any one aggregate on any other, follows in a uniform way from the mutual influences of the constituent particles taken by pairs (1925, pp. 44-5).

This vision is so ethereal that nothing like it has ever been seriously entertained. But the actual mechanical world view and its successors for a couple of centuries of furious and spectacularly

⁵Leibniz’s celebrated solution to the mind-body problem, the pre-established harmony (1695/1997) between the material and mental realms, *predicts* the existence of neural correlates of consciousness. Leibniz (1696/1997) provides an interesting discussion the three possible relations between matter and consciousness: causal, miraculous and harmony.

⁶Newton’s acceptance of such perhaps ‘occult’ powers was anathema to strict mechanists who denied both action at a distance and hoped for a physics based solely upon inter-particle collision. Leibniz himself, along with several other luminaries, attempted to develop vortex based accounts of planetary motion which avoided Newtonian gravitation with some incomplete success (see Aiton 1972).

successful development can be seen as implicitly inspired by this pure vision. It expresses well a picture of the world – let’s call it ‘lego world’ – formed of a very large number of very small parts which are metaphysically independent of each other, have individual identities (albeit ones of very little interest) but which can interact by local causation. The familiarity we have with things like this, think marbles or, indeed, lego blocks is what funds confidence in our conception of matter or the physical and makes it seem intuitive and almost obvious . . . and very distant from subjectivity.

The mechanical world view leveraged this picture into an intuitive positive conception of the nature of matter: it came in chunks akin to the small particles we are familiar with in ordinary experience: impenetrable, capable of motion and – thanks ultimately to God’s decree – observant of the fundamental rules or laws of nature which governed how these pieces interacted (e.g. conservation of energy). Exactly how and why these material units are ‘forced’ to obey the laws of nature remained (and remains) somewhat obscure. Perhaps the laws’ power is just a primitive metaphysical fact which links properties with the appropriate level of modal force. Perhaps the laws somehow follow from the causal powers of the fundamental entities of the world. Maybe the laws are a mere catalogue of universal regularities, or meta-regularities across a set of possible worlds (the ‘nomologically possible worlds’). Perhaps the laws are an imposition of the conscious mind which ‘imposes’ them upon an intrinsically chaotic universe (we find laws of nature because if we could not exist in those regions of possibility that were ‘too’ chaotic; a kind of anthropic Kantianism).

In any case, this conception of matter excluded consciousness as one of its properties (except perhaps if God directly and miraculously ‘superadded’ it to a material system⁷) and, in any case, there was no need to posit consciousness to generate all the forms and activities in which matter could participate. As to these forms, we now know that lego world is capable of implementing a Turing machine so such a world could at least simulate anything which can be computed (ignoring speculative hyper-computational devices), including quantum mechanics. Such a simulation might be very slow but one should not confuse the simulation runtime with the time internal to the simulation. Perhaps, so to speak, it might take $10^{\text{googleplex}}$ seconds of simulation time to compute one yoctosecond of internal simulation time, but we can suppose that the simulation lives in an eternal and spatially infinite world so there is no principled limitation here (we can suppose the physics of the simulation world is unconstrained by anything except its being a lego world). Presumably, our entire universe, or at least the observable universe, can thus be simulated given that the number of possible initial conditions (the degrees of freedom of the big bang) is finite (which seems to be implied by current theory, e.g. the holographic principle and possible theories of quantum gravity).

So the lego world conception is in fact a spectacularly powerful one and it is based upon an

⁷Something Locke famously asserted was within the power of God and to which Leibniz agreed, though according to him it could be accomplished only via an objectionable ‘perpetual miracle’ (see 1704/1996, p. 67).

intuitively attractive conception of the nature of matter. One reason panpsychism seems weird to people is that they have implicitly absorbed something like the mechanistic view of the material world and its conception of the nature of the physical. But notwithstanding the power of the lego world picture, its positive conception of the physical was exploded in the first half of the 20th century. Matter does not form the ‘lego world’ imagined by the early mechanists. It turns out that matter is nothing at all like ‘matter’ was supposed to be.

Of course, it is quantum mechanics that has revealed this to us. This lesson is perhaps the number one thing that quantum mechanics is ‘trying to tell us’. Quantum entanglement seems to hint that nature is holistic and that a world of independent material parts is merely a kind of emergent approximation. This has been noted many times by physicists beginning almost from the birth of quantum mechanics:

- Erwin Schrödinger: a particle certainly is ... not a durable little thing with individuality
- Hans Primas: the idea. . . that the material world is. . . structured by some kind of interacting ‘elementary systems’ is in sharp contradiction [with] quantum mechanics
- Basil Hiley: quantum phenomena require us to think in a radical new way, a way in which we will have to ultimately give up both the notion of particles and fields
- David Bohm: the entire universe must, on a very accurate level, be regarded as a single indivisible unit in which separate parts appear as idealizations permissible only on a classical level of accuracy of description

Our best quantum theory asserts that fundamental reality is composed not of material particles at all but rather strange universal fields, the temporary excitations of which can appear to our experiments as particle-like apparitions. These fields appear to exist in an extremely (infinite?) high dimensional space which cannot be directly identified with the space and time of experience.

But despite the radical revision required by the quantum mechanical picture of the world, our new physics has no need to add *consciousness* to the quantum fields to generate the physical phenomena and structure which we can observe⁸. The structures and systems of relations amongst the physical attributes of the world are generated from the purely physical fundamental features posited by physics with no hint of intrinsic subjectivity. So the great revolution in physics occasioned by the discovery of quantum mechanics has not by itself closed the explanatory gap and solved the hard problem of consciousness. In fact, as noted, some aspects of quantum physics, most famously the nature of observation or measurement, may suggest a fundamental role for

⁸It may need to add consciousness to the picture in order to get determinate observations, but that is an extra feature that has always seemed unscientific. Very few, but not no, physicists believe that the solution to the measurement problem essentially involves consciousness (see McQueen and Chalmers (forthcoming) for philosophical discussion).

consciousness⁹ but, even if it is real, it is a role which figures *outside* of the system described by physical theory, breaking the law which governs the evolution of the quantum state.

The end of lego world and the mechanistic, or neo-mechanistic, picture of the world means we have lost any viable positive conception of the fundamental nature of matter. What we are left with is nothing more than the relational structure linked to observables which physics maps out for us with such stunning success. It is thus also the case that there is no direct impediment to the panpsychist hypothesis stemming from an acceptable positive conception of the nature of the physical.

Lacking an explanation of consciousness in physical terms and lacking any conception of material reality beyond the structural the panpsychist steps into the opening and suggests that perhaps the fundamental reality of the physical world itself partakes of some aspect of subjective consciousness. Again, this does not mean that quantum field particle states are reflecting about their own existence, enjoying a rich inner life akin to our own (though some vast multi-particle states are, namely ourselves). But minimal, unsophisticated and unreflective consciousness is much more common than its opposite, as witnessed by the host of pretty clearly conscious animals some of which must have extremely limited forms of awareness. All the panpsychist needs to posit is that some form of subjectivity, some kind of primitive feeling, is at the foundation of the physical world.

No positive conception of the physical precludes this posit, since we have no such conception. The hypotheses of physics, of course, make no mention of consciousness but this is no surprise given the structuralist constraints of physical science. But, roughly speaking, something beyond structure is needed to make reality concrete. This point was perhaps made most precisely and forcefully by Max Newman (1928) in his critique of Russell's attempt at a purely structural account of science. Given any system of entities, a merely abstract specification of structure as, say, sets of ordered n-tuples, is revealed to be already present (sets exist if their members do). Something has to 'select' a certain structure as 'real' or concrete and, obviously, this 'something' has to go beyond simply additional relational structure. This point should not be over interpreted. It does not imply the return of objects in the sense of independent units with persistent and genuine individuality. It is simply the requirement that some form of concrete reality is needed to, so to speak, realize what are otherwise pure abstractions¹⁰. Why not, asks the panpsychist, let the one non-structural reality we are already acquainted with and for which we do have a positive conception, namely our own subjectivity, stand as this foundation?

I will concede that this sort of consideration does not make panpsychism exactly plausible. It strikes many as beyond strange to think of the world as awake and kind of 'humming' with a primitive consciousness suffused throughout it as if there was an extra dimension of basic subjectivity.

⁹The specific idea that measurement requires the intervention of a conscious observer appears is somewhat veiled ways in Bohr and von Neumann. It is explicitly advanced in London and Bauer (1939/1983) and Wigner (1962). A modern proponent is Henry Stapp (e.g. 1993).

¹⁰For discussion of the subtleties of Newman's objection to Russell see Demopoulos and Friedman (1985); see also van Fraassen (2007) and the radical pro-structuralist discussion in Ladyman *et al.* (2007).

Many or most would still prefer a physicalist metaphysics. But it seems to me that, at bottom, there are only two alternatives which abide with standard physicalism¹¹.

The first is emergentism. Like the word ‘consciousness’, the term ‘emergence’ is fraught with ambiguity. The minimal sense of the notion is simply that of a system having properties which are not possessed by its parts. Familiar and uncontroversial examples abound: the liquidity of water, the vortex structure of a tornado or hurricane. Commonplace but more exotic and controversial forms are things like the collective intentionality of groups or nations. In any case, the world is awash in emergence: almost everything you could think of has properties which are not shared by the fundamental physical entities postulated by physics. But this sort of standard or conservative emergence based upon complexity does not engender an explanatory gap. When vast numbers of hydrogen and oxygen atoms, for example, get together just right (and noting that these atoms, and their constituent nucleons are themselves emergent entities of the same sort) we get liquid water, which is a remarkable substance whose complexities are still not fully understood, although we do more every day with ‘ab initio molecular dynamics simulations’ of critical temperatures, density changes and the like (see e.g. Morawietz *et al.* 2016). Such efforts reveal that there is no doubt about the general route from oxygen and hydrogen to the properties of water. From one point of view, this should not be at all surprising. The properties of water at issue are themselves purely structural and a natural target for the structure based systems explored by more fundamental physics.

On a much grander level, we have learned a tremendous amount about the emergence of the classical world from its quantum underpinnings via decoherence (see the canonical text Joos *et al.* 2003) and the rise of effective field theory understood via the renormalization group procedure reveals why the world is amenable to our theoretical descriptions even if we can be quite sure that these descriptions are in themselves incomplete and ultimately inaccurate. Thus quantum field theory itself is regarded as a merely empirically adequate emergent within a delimited sector of nature: ‘we have learned in recent years to think of our successful quantum field theories . . . as “effective field theories”, low-energy approximations to a deeper theory that might not even be a field theory’ (Weinberg 1995, p. xxi). Note that from the structuralist viewpoint the prospect of potentially radical theoretical transformation is not a big problem. The predictive and explanatory successes of field theories remain since the structure they revealed remains after theory change.

Let’s group this widespread and internally quite diverse form of emergence under the term of ‘conservative emergence’. Its twin hallmarks are first that there is an intelligible route from the constituents of a system, broadly conceived to include everything from atoms to field states to theoretical structures, to its emergent properties, even if complexity will often preclude precise predictions of exact values of the emergent features and second, that the emergent features will be largely describable and explicable in terms of their own proprietary laws, albeit always subject to

¹¹There are non-physicalist alternative to panpsychism. Idealism, for example, retains defenders and has sparked some renewed interest in recent philosophy (see e.g. Foster 2008, Pelczar 2015, Chalmers (forthcoming)).

potential interference from the more fundamental submergent underpinnings. It is an amazing fact about our world that it is structured by a hierarchy of relatively autonomous emergent domains (of course, if it were not, we would not be here).

The emergence of subjectivity presents a problem of an entirely different order and seems to call for more than conservative emergence. Ever more complex calculations of the behaviour of ever more complicated physical systems will not get us to consciousness, even if it should prove possible to model the behavior of human beings, say via sophisticated computational neural simulations. There is no intelligible route from the relational structures found in our physical science to the intrinsic property of subjectivity. We are thus left with a *radical* emergence in which subjectivity simply appears at some, seemingly arbitrary, point in the physical development of the universe rather like Locke's fantasy of God directly 'superadding' consciousness to matter. Although logically possible, such a radical emergence is entirely at odds with the whole point of the physicalist enterprise. Furthermore, there is no reason to think that a radically emergent feature is itself physical in nature; quite the opposite in fact given that all the physical features we know are either fundamental or conservative emergents that arise from assemblages and interactions of, ultimately, the fundamental features of the physical world.

Absent emergence, the second alternative is denial. Perhaps there is nothing more to the world than the relational structures posited by physics, along with all the conservatively emergent outgrowths of basic physical processes. There are two immediate problems with such an heroic response. The first is that we are left in ignorance about the underlying nature of matter. I suppose the best physicalist reply is that this is simply an unavoidable and fundamental limitation to our knowledge, regrettable perhaps but not such as to recommend endorsing panpsychism over epistemic humility (see Langton 1998, Lewis 2009).

The second problem seems much more serious: denying the reality of subjective experience is a desperate measure and one of dubious coherence. The immediately most obvious argument for the incoherence of the position is very simple:

- (1) If consciousness is an illusion then it merely seems that it exists.
- (2) But if anything *seems* to exist, that seeming is a state of consciousness.
- (C) Therefore consciousness (states of consciousness) exists.

The most developed ultra-eliminativism about experience itself is that of Daniel Dennett which attempts, cleverly but ultimately unsuccessfully, works around this argument. Dennett proposes that we suffer an illusion that subjective experience exists but that this illusion is a purely cognitive 'thought-illusion' which can be explained in terms of a science of entirely non-conscious intentional states (see e.g. Dennett 1991; for criticism see Seager 2017). Dennett exploits that fact that the term 'seems' has both an experiential and epistemic sense (contrast 'the sun seems to be rising' versus 'it seems that Trump will irreparably harm America'). The latter sense does not immediately demand any experiential component which is why Dennett can say without falling

into immediate contradiction that '[t]here seems to be phenomenology ... But it does not follow from this undeniable, universally attested fact that there really is phenomenology (1991, p. 366).

Of course, this line of attack requires some explication of a purely cognitive, non-experiential theory of thought content which Dennett has attempted to supply with his theory of intentional stances. A particularly sophisticated deployment of this account leads to what he calls the method of heterophenomenology. Applying it to those misguided enough to believe in consciousness, heterophenomenology

involves extracting and purifying texts from (apparently) speaking subjects, and using those texts to generate a theorist's fiction, the subject's heterophenomenological world. This fictional world is populated with all the images, events, sounds, smells, hunches, presentiments, and feelings that the subject (apparently) sincerely believes to exist in his or her (or its) stream of consciousness (Dennett 1991, p. 98).

The basic problem with this approach, as I see it, is that it fairly obviously has a tacit dependence on the experience and consciousness of the notional 'researcher' who is performing the heterophenomenological exercise.

One way to see this is to take an epistemological route. Following the old path of Descartes, let us each ask ourselves whether we know that something exists, or that something is happening right now. It is evident that we have access to a realm of data which by itself guarantees that yes, indeed, something exists. But the relational structures of physics cannot provide that guarantee since their existence is not a certainty: what is certain is the realm of subjective experience. If we posit that this realm does not exist, then we are left with the disturbing possibility that, given how things are now, nothing at all exists. If anything is clear it is that that thought is self refuting as soon as it is consciously thought. We do have access to a realm of immediately available and unassailable self-knowledge, albeit of a quite limited form (which limitations Descartes also emphasized). Denying this is to undermine the claim that we can know we are thinking at all, or indeed, that we know that anything exists. It is much more plausible that consciousness exists than that we cannot unassailably assert certain propositions which we understand.

Granting that conscious experience exists (as if this were a concession!) does not entail panpsychism. We can retain an epistemic humility about the underlying nature of the material world along with the – in this context now somewhat puzzlingly assertive – denial that it involves subjectivity. And we can always retain the hope that a conservatively emergent path from neuroscience (or elsewhere in the sciences) will illuminate the generation of consciousness by a world bereft of fundamental subjectivity. But the former view is not mandatory and there is not the slightest hint of the how the latter might be accomplished.

Panpsychism promises to integrate our scientific and 'personal' view of the world and do so in a way that respects both the completeness of the physical picture of the causal structure of the world it investigates and the role of consciousness itself. The price to pay is admission of subjectivity

into the foundation of the world as one of its fundamental features.

Needless to say, panpsychism faces many problems beyond its initial air of implausibility. But these are problems which can be philosophically explored, analyzed and perhaps solved. For example, one might wonder why, if panpsychism is true, we see no sign of subjectivity at the fundamental physical level (electrons do not seem to be experiential subjects). But in fact the only direct revelation of subjectivity is in our own experience and the panpsychist interprets this as evidence, that ‘consciousness. . . provides a kind of “window” on to our brains’ thereby revealing ‘some at least of the intrinsic qualities of the states and processes which go to make up the material world’ (Lockwood 1989, p. 159). The fact that very simple physical systems do not exhibit complex behavior should not be surprising but its hardly clear that this *shows* they lack a subjective aspect.

The most vexing difficulty facing panpsychism is the so-called ‘combination problem’ (see James 1890/1950, ch. 6, Seager 1995) which is the issue of how the primitive foundational aspect of subjectivity postulated by the panpsychist builds itself into the sophisticated and rich forms of consciousness which creatures like us enjoy. This is not the place to discuss this in detail. Suffice to say that recent work has offered a variety of possible approaches to the combination problem (see many of the papers in Brüntrup and Jaskolla 2016, especially Chalmers 2016 and Goff 2016, and many of the papers in Seager (forthcoming)). Some of these approaches use the reasonably familiar relation of co-consciousness, some use a relation of phenomenal blending, some devise a notion of phenomenal bonding and some develop the idea that primitive experiential aspects ‘fuse’ into new forms, superceding the originals. It is also possible to re-orient the problem by adopting a radical holism, in which the single fundamental entity is the universe as a whole. Panpsychism then becomes what is called ‘cosmopsychism’, and the combination problem becomes the ‘de-combination’ problem. This somewhat Spinozistic view is as yet little explored but see Albahari (forthcoming), Goff (2017) and Goff (forthcoming). All of these ideas face serious objections, but they all stand as potential answers to the combination problem. The point here is that the combination problem is one that can be addressed fruitfully. It is not a show-stopper.

Philosophical exploration and development of the panpsychism is possible and has already proved fruitful. Panpsychism is a viable solution to the traditional mind-body problem and addresses the more modern specific problem of consciousness. We can throw off the shackles of an outmoded and falsely restrictive conception of the physical and declare that the world is awake.

William Seager
Department of Philosophy
University of Toronto

References

- Aaronson, Scott (2016). ‘The Ghost in the Quantum Turing Machine’. In S. Barry Cooper and Andrew Hodges (eds.), *The Once and Future Turing*, pp. 193–296. Cambridge: Cambridge University Press.
- Aiton, Eric (1972). *The Vortex Theory of Planetary Motions*. London: Macdonald.
- Albahari, Miri (forthcoming). ‘Beyond Cosmopsychism and the Great I Am: How the World might be Grounded in Universal ‘Advaitic’ Consciousness’. In W. Seager (ed.), *The Routledge Handbook of Panpsychism*. London: Routledge.
- Alter, T. and Y. Nagasawa (eds.) (2015). *Consciousness in the Physical World: Perspectives on Russellian Monism*. Oxford: Oxford University Press.
- Broad, C. D. (1925). *Mind and Its Place in Nature*. London: Routledge and Kegan Paul.
- Brüntrup, G. and L. Jaskolla (eds.) (2016). *Panpsychism*. Oxford: Oxford University Press.
- Chalmers, David (1995). ‘Facing Up to the Problem of Consciousness’. *Journal of Consciousness Studies*, 2 (3): pp. 200–19. Reprinted in J. Shear (ed.) *Explaining Consciousness*, Cambridge: MA, MIT Press, pp. 9-32, 1997.
- Chalmers, David (1996). *The Conscious Mind: In Search of a Fundamental Theory*. Oxford: Oxford University Press.
- Chalmers, David (2016). ‘The Combination Problem for Panpsychism’. In G. Brüntrup and L. Jaskolla (eds.), *Panpsychism*, pp. 229–48. Oxford: Oxford University Press.
- Chalmers, David (forthcoming). ‘Idealism’. In W. Seager (ed.), *The Routledge Handbook of Panpsychism*. London: Routledge.
- Chomsky, Noam (2000). *New Horizons in the Study of Language and Mind*. Cambridge: Cambridge University Press.
- Demopoulos, William and Michael Friedman (1985). ‘Bertrand Russell’s The Analysis of Matter: Its Historical Context and Contemporary Interest’. *Philosophy of Science*, 52 (4): pp. 621–39.
- Dennett, Daniel (1991). *Consciousness Explained*. Boston: Little, Brown & Co.
- Foster, John (2008). *A World for Us: The Case for Phenomenalistic Idealism*. Oxford: Oxford University Press.
- French, Steven (2014). *The Structure of the World: Metaphysics and Representation*. Oxford: Oxford University Press.

- Goff, Philip (2016). ‘The Phenomenal Bonding Solution to the Combination Problem’. In G. Brüntrup and L. Jaskolla (eds.), *Panpsychism*, pp. 283–304. Oxford: Oxford University Press.
- Goff, Philip (2017). *Consciousness and Fundamental Reality*. Oxford: Oxford University Press.
- Goff, Philip (forthcoming). ‘Cosmopsychism, Micropsychism and the Grounding Relation’. In William Seager (ed.), *The Routledge Handbook of Panpsychism*. London: Routledge.
- James, William (1890/1950). *The Principles of Psychology*, vol. 1. New York: Henry Holt and Co. Reprinted in 1950, New York: Dover. (Page references to the Dover edition.)
- Joos, Erich, H. Dieter Zeh *et al.* (2003). *Decoherence and the Appearance of a Classical World in Quantum Theory*. Berlin: Springer-Verlag, 2nd ed.
- Ladyman, James, Don Ross *et al.* (2007). *Everything Must Go: Metaphysics Naturalized*. Oxford: Oxford University Press.
- Langton, Rae (1998). *Kantian Humility: Our Ignorance of Things In Themselves*. Oxford: Oxford University Press.
- Leibniz, G. W. (1696/1997). ‘Letter to Basnage’. In R. Woolhouse and R. Francks (eds.), *Leibniz’s ‘New System’: and associated contemporary texts*, pp. 62–4. Oxford: Oxford University Press (Clarendon). See C. I. Gerhardt (ed.) *Die philosophischen schriften von Gottfried Wilhelm Leibniz*, Volume 4, Berlin: Weidmann, 1880, pp. 496ff.
- Leibniz, Gottfried Wilhelm (1695/1997). ‘New System of the Nature of Substances and their Communication, and of the Union which Exists between the Soul and the Body’. In R. Woolhouse and R. Francks (eds.), *Leibniz’s ‘New System’ and Associated Contemporary Texts*, pp. 7–36. Oxford: Oxford University Press.
- Leibniz, Gottfried Wilhelm (1704/1996). *New Essays on Human Understanding*. Cambridge: Cambridge University Press. J. Bennett and P. Remnant (trans. & ed.). Although this work was not published by Leibniz it was an essentially complete work, composed around 1704-5.
- Leibniz, Gottfried Wilhelm (1714/1989). ‘Monadology’. In Roger Ariew and Daniel Garber (eds.), *G. W. Leibniz: Philosophical Essays*, pp. 214–24. Indianapolis: Hackett.
- Levine, Joseph (1983). ‘Materialism and Qualia: The Explanatory Gap’. *Pacific Philosophical Quarterly*, 64: pp. 354–61.
- Lewis, David (2009). ‘Ramseyan Humility’. In David Braddon-Michell and Robert Nola (eds.), *Conceptual Analysis and Philosophical Naturalism*, pp. 203–22. Cambridge, MA: MIT Press (Bradford Books).

- Lockwood, Michael (1989). *Mind, Brain and the Quantum*. Oxford: Blackwell.
- London, Fritz and Edmond Bauer (1939/1983). ‘The Theory of Observation in Quantum Mechanics’. In J. Wheeler and W. Zurek (eds.), *Quantum Theory and Measurement*, pp. 217–59. Princeton: Princeton University Press. Originally published as ‘La théorie de l’observation en mécanique quantique’ in *Actualités scientifiques et industrielles*, no. 775, Paris: Heinemann, 1939.
- McGinn, Colin (1999). *The Mysterious Flame: Conscious Minds in a Material World*. New York: Basic Books.
- Mill, John Stuart (1843/1963). *A System of Logic*, vol. 7-8 of *The Collected Works of John Stuart Mill*. Toronto: University of Toronto Press.
- Montero, Barbara (2009). ‘What is the Physical?’ In B. McLaughlin, A. Beckermann and S. Walter (eds.), *The Oxford Handbook of Philosophy of Mind*, pp. 173–188. Oxford: Oxford University Press.
- Morawietz, Tobias, Andreas Singraber *et al.* (2016). ‘How van der Waals interactions determine the unique properties of water’. *Proceedings of the National Academy of Sciences*, 113 (30): pp. 8368–73. URL <http://www.pnas.org/content/113/30/8368.abstract>.
- Nagel, Thomas (1979). ‘Panpsychism’. In *Mortal Questions*, pp. 181–95. Cambridge: Cambridge University Press. (Reprinted in D. Clarke *Panpsychism: Past and Recent Selected Readings*, Albany: SUNY Press, 2004.).
- Nagel, Thomas (1986). *The View from Nowhere*. Oxford: Oxford University Press.
- Newman, M. (1928). ‘Mr. Russell’s Causal Theory of Perception’. *Mind*, 37: pp. 137–48.
- Newton, Isaac (1730/1979). *Opticks, or, A Treatise of the Reflections, Refractions, Inflections and Colours of Light*. New York: Dover, 4th ed.
- Owen, Adrian M. (2008). ‘Functional neuroimaging of the vegetative state’. *Nature Reviews Neuroscience*, 9 (3): pp. 235–43.
- Owen, Adrian M. (2017). *Into the Gray Zone: A Neuroscientist Explores the Border Between Life and Death*. New York: Scribner.
- Pelczar, Michael (2015). *Sensorama: A Phenomenalist Analysis of Spacetime and Its Contents*. Oxford: Oxford University Press.
- Seager, W. (2017). ‘Could Consciousness Be an Illusion?’ *Mind and Matter*, 15 (1): pp. 7–28.

- Seager, William (1995). ‘Consciousness, Information and Panpsychism’. *Journal of Consciousness Studies*, 2 (3): pp. 272–88. (Reprinted in J. Shear (ed.) *Explaining Consciousness*, Cambridge, MA: MIT Press, 1997.).
- Seager, William (ed.) (forthcoming). *The Routledge Handbook on Panpsychism*. London: Routledge.
- Searle, John (1992). *The Rediscovery of the Mind*. Cambridge, MA: MIT Press.
- Searle, John (2013). ‘Can Information Theory Explain Consciousness’. *New York Review of Books*, (January 10).
- Stapp, Henry (1993). ‘A quantum theory of the mind-brain interface’. In *Mind, Matter and Quantum Mechanics*, pp. 145–72. Berlin: Springer.
- van Fraassen, BasC. (2007). ‘Structuralism(s) About Science: Some Common Problems’. *Proceedings of The Aristotelian Society Supplementary Volume*, 81 (1): pp. 45–61.
- Weinberg, S. (1995). *The Quantum theory of Fields. Vol. 1: Foundations*. Cambridge: Cambridge University Press.
- Wigner, Eugene (1962). ‘Remarks on the Mind-Body Problem’. In I. Good (ed.), *The Scientist Speculates*, pp. 284–302. London: Heinemann. Reprinted in J. Wheeler and W. Zurek (eds.) *Quantum Theory and Measurement*, Princeton: Princeton University Press, 1983, pp. 168–81.
- Wilson, Jessica M. (2006). ‘On Characterizing the Physical’. *Philosophical Studies*, 131 (1): pp. 61–99.