Mind that Abides

Panpsychism in the new millennium

Edited by
David Skrbina

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Mind that Abides

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This book is dedicated to those philosophers of the future who, through a panpsychist metaphysics, are able to 'force the will of millennia upon new tracks' (to paraphrase Nietzsche).

D. S.

Introduction

In the Diamond Sutra it is written: "Mind that abides nowhere must come forth." Mind indeed seems to abide nowhere, yet it does undeniably come forth.[1] Mind is real enough for each of us, yet it seems to dwell nowhere in the physical world. We are tempted to say that mind 'resides in the brain,' but when we ask how and why it resides there, and when we look for specific processes or structures that might give rise to specific mental qualities, we are at a loss. We think it resides in the 'higher animals,' but we are less certain here than with ourselves. We have convinced ourselves that it is absent in the lesser forms of life, and in the nonliving, but cannot know this for certain, and we are unable to explain when, and why, it allegedly drops from existence. To judge from the failures of philosophy of mind and cognitive science of the past years to locate the 'seat of consciousness' or the correlates of mind, one could almost be excused for believing that mind abides nowhere – indeed, nowhere at all.

The moral of the sutra, I think, is this: Mind comes forth even from those places where it seems to abide not. In the least likely of places, in the most inanimate and the least organic – even there, mind comes forth. So in a sense we end up with the paradoxical conclusion: Mind, perhaps, abides *everywhere*. This in fact was the intuition of the great Eastern philosophies, as it has been for many of the deepest thinkers in the Western tradition. Nearly 2,500 years ago Empedocles promised that by holding such a view before oneself, and contemplating it "with good will and unclouded attention," that it would yield great things.[2] I intend to take him at his word.

If we allow the possibility that this may be a panpsychic cosmos in which we dwell, a variety of new approaches to age-old questions of mind and consciousness open up to us. If mind is universal, it clearly must have general qualities or characteristics that are extrapolations from those with which we are intimately familiar. More precisely, our experience of mind must be a refined or specialized instance of some universal phenomena. Hence we may do well to deemphasize the quest for the specifically human embodiment of mind, and look instead to more fundamental features of existence. We might try to discern and articulate those aspects of our own minds that may be candidates for universal mental properties. At the very least, we will no longer be brought to a screeching halt when some tentative theory of mind suggests that it may

1. I will set aside arguments for eliminative materialism, which is, after all, a kind of degenerate consequence of hard-core physicalism.

2. Guthrie's translation of fragment 110 (1962–1981, vol. 2, p. 230).

be ubiquitous. Panpsychism is no *reductio*; rather, it may well be an indication that one is on the right track, that one is getting to the root of this thing we call mind.

At the outset I want to dispel three common misconceptions. First, panpsychism is not idealism. The fact that all things have mind, or instantiate mind, or embody mental states, is not the same as saying that things *are* mind, or that mind is the ultimate reality, or that the physical is reducible to the mental. Certainly one can be both a panpsychist and an idealist – names like Schopenhauer, Royce, and Bradley come to mind – but there is no necessary connection. In fact the vast majority of panpsychists were not (and are not) idealists.

Second, panpsychism is not dualism. Dualism holds that there exist two fundamental substances, typically matter and mind; it tells us nothing about how widespread such mind must be. As with idealism, it clearly is possible to be a panpsychist dualist – one need only argue that all objects possess, or interact with, a corresponding immaterial mind or psyche. Such a position, however, is rare within philosophical circles; nearly all panpsychists are nondualist.

Third, panpsychism is not supernaturalism. The reference to 'psyche' should not lead the reader to think that we are contemplating immortal souls or spirits in all things. Even less should it suggest a commitment to a theological position of any sort. Panpsychism resides quite happily in a naturalistic, monistic, and even physicalist cosmos.

Today, most philosophers of mind have migrated to monistic worldviews.[3] Consequently, both 'mind' and 'body' are nothing more than different manifestations or modifications of the same unitary substance. Hence the relation between mind and brain (or body, or matter) must be one of *fundamentally like entities*. This minimizes problems of causality, but it also entails that the one reality must, in some essential way, be either *mind-like itself*, or must possess an *innate power to produce mind*. The former is explicit panpsychism. Mind could be a fundamental attribute of reality, along the lines of mass, charge, spin, and quanta. Or perhaps the one monistic reality is at once physical and mental – a kind of radical identity theory. But even in the latter case, it is hard to see how a single underlying reality could have such power without exhibiting some mental qualities in its own right; this would yield a kind of implicit or 'proto' panpsychism.

But anti-panpsychist monists have an alternative – they can claim that mind 'emerges' from an utterly non-mental substrate. Putting it simply: At some point in the past there was no mind, and today there is, therefore mind must have emerged from no-mind. This is the standard view. It is widely held, but rarely defended. And for good reason – it is deeply problematic.

If true, we should be able to say, very roughly, *when* mind emerged, *where* it emerged, and *why* it emerged. The evolutionary emergence of mind on the Earth, some

3. Even the so-called property (or attribute) dualists still hold to a single ultimate reality, though it goes by various names. But a point is underappreciated: *property dualism is ontological monism*. Property dualists are not really dualists after all.

millions (or billions?) of years ago would have been a monumental event in our history, and the emergentist should be able to give us some very general idea of when, and in which organism(s), this feature first came to be; this is the *historical* aspect of the issue. Secondly, considering the range of organisms that exist on the planet today, the emergentist should be able to give us a compelling explanation of which entities possess mind, and which don't. This is the *phylogenic* question: where should we draw the line between enminded and unminded beings? Finally there is what I call the *ontogenic* question: when, for example, in the development of the human fetus does mind appear? The emergentist must hold that the fertilized egg has no mind, and that the newborn baby does – so, when in the course of those nine months did mind magically appear? To claim that it gradually ramps-up will not do; the emergentist is committed to an *absolute jump* at some point in the fetus' development, from zero mind to mind. Truly a magic event. As it happens, emergentist philosophers are utterly at a loss when it comes to these very basic and very important questions. Lacking rational justification, emergence is accepted simply as a matter of faith.

Some are prepared to go further and claim that this alleged brute emergence of mind – mind from mindless matter – is not only problematic, it is *incomprehensible*. This fact was recognized already by Epicurus, who argued that human will could not emerge from deterministic atoms, and therefore that atoms themselves possessed a small degree of will (hence, panpsychism). Telesio, Patrizi, Gilbert, Campanella, Fechner, Paulsen, Clifford, Strong, Teilhard, and Wright all used versions of the same argument on behalf of panpsychism.[4]

More recently Galen Strawson has reiterated this point in a most forceful way. The notion that mental experience can emerge from a wholly non-mental, non-experiential substrate is, he says, nonsense: "I think it is very, very hard to understand what it is supposed to involve. I think that it is incoherent, in fact…" (2006: 12). Emergence works for almost everything in this world – liquidity, life, Homo sapiens – because the relevant properties already exist in matter. Emergence can, and does, happen all the time; but "it can't be brute." Under the standard physicalist view, there are no relevant properties in matter that would allow mind to emerge.[5] In fact precisely the opposite: matter is *explicitly* devoid of mind and experience, we are told. Hence the emergence of true mind becomes an inexplicable miracle. Rather than accept miracles, we might be better served by dropping the crude physicalism and looking for panpsychist alternatives.

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4. For details, see Skrbina (2005).

5. I should be clear that physicalism (materialism) is *not inherently* opposed to panpsychism. For example, Lamettrie and Diderot were both known for developing theories of *vitalistic* materialism. Several historical panpsychists were monists, many of whom implicit materialists. And Strawson himself argues that any *real* physicalism – that is, any coherent and rational form of the theory – must be panpsychist. However, the common usage of 'physicalism' implies a completely *non-mental* form of physicalism, i.e. a mechanistic materialism. I will stay with this conventional usage.

For many philosophers, both past and present, both East and West, panpsychism thus stands as the more viable option. But this is not enough. Panpsychism simply claims that the components of the world have some inherent experiential or mind-like qualities. This is a long way from an understanding of the human mind, let alone mind as a universal property. Hence the central aim of this book: to move ahead on the subject of panpsychism, to take it seriously, and to try to flesh out more complete theories of mind. Such a step, by experts from various fields, is unprecedented. It is long overdue.

The advent of this renaissance and re-emergence of panpsychism as a serious field of study calls for a broad-based approach. The contributors to this volume cut across a wide range of disciplines, and address the topic from a diversity of backgrounds. Panpsychism has vast implications for many areas of thought, and thus it is precisely such a diversity of ideas that we need at this moment.

Following a concise historical overview of panpsychism, Part One examines analytical and scientific approaches to the topic. It begins with Strawson's soon-to-be classic, "Realistic monism," a piece gratefully reprinted from the *Journal of Consciousness Studies*.[6] This is followed by an excerpt on his 'sesmet' theory of subjective experience. After Strawson we have a number of new arguments and analyses of panpsychism – from quantum theory, neurobiology, analytical philosophy, and quasi-idealism.

Part Two incorporates four essays that specifically focus on the process philosophical approach. Whitehead, Russell, Hartshorne, and Griffin, among other process thinkers, have been the dominant carriers of the panpsychist tradition in the past century, and this line of thinking is as lively and productive as ever.

Part Three encompasses a range of more purely metaphysical approaches to panpsychism. It covers phenomenological concepts, eco-philosophy, Eastern philosophy, and classical dual-aspect theories.

It is our hope that this collection of ideas and theories will launch panpsychism into the third millennium with vigor and promise, as befitting such a venerable conception of mind. For this momentous rededication, I think we could have had no better collection of contributors than those that follow.

David Skrbina

6. Volume 13, 10–11 (2006). This is the only chapter that was previously published elsewhere.

CHAPTER 1

Panpsychism in history

An overview

David Skrbina

Philosophically speaking, we humans are an arrogant lot. We quite easily see ourselves as different, special, unique, even superior to the rest of nature. We think ourselves more valuable, more intelligent, more powerful than every other creature on this planet. But of course – we are the favorites of God's creations, after all.

Perhaps the most important way in which we think of ourselves as unique is in our possession of *psyche* – soul, mind, and consciousness. Granted, there is some debate regarding, for example, the so-called higher animals. We like to quibble about the details: 'animals may be conscious, but surely not self-conscious'; 'yes, chimps and dolphins can think, but they don't have a mind'; 'animals have only pseudo-intelligent instinctual reactions.' We argue endlessly about the definition of mind and intelligence, with but little to show for all our hard work. Yet even lacking a consensus definition of mind, we frequently do not hesitate to pronounce our species its sole possessor. A few are more generous in their attribution of mind, but even they have a hard time fully admitting more than the 'higher animals' into the rarefied circle.

Considering the 'lower animals' (one wonders what those might be), very few people grant them anything close to mind or consciousness. Insects, worms, microbes – out of the question. Plants obviously are mindless organisms, we are told – except for those eccentrics who talk to their plants, or photograph their so-called life energy. Then we arrive at the 'unambiguous' forms of existence: viruses, rocks, complex molecules, atoms, subatomic particles. Surely nothing mind-like there.

Such intuition runs deep in our modern world. We have centuries of objectivist, materialist science to support the view that matter is inherently lifeless, unfeeling, and psychically inert. We see no signs of such existence. Under our dominant mechanistic worldview we have no reason to postulate it. Occam's Razor argues against it. Non-human mind has no explanatory value whatsoever. The thesis is unfalsifiable, and hence unwarranted – so science tells us. Furthermore this bias is supported by even older religious dispositions. In all monotheistic Western religions, humans alone possess a divine and immortal soul.

These two metaphysical outlooks – religion and science – were unified by Descartes in the 17th century. He merged the religious and nascent scientific ontologies into a comprehensive worldview of mind and matter, body and soul, with humans located at the privileged center of things. Mind was one thing, matter another, and they were as ontologically distinct as could be. Humans alone were granted mind and soul. Animals and the rest of non-human nature were mindless mechanisms – mere clockwork automatons created by God to serve humanity.

Consequently, those today who might lean toward a more generous view of mind find powerful forces working against them. Religion opposes it. Science opposes it. Analytic philosophy opposes it. 'Common sense' opposes it.

And yet. . .not everyone is so easily swayed. Many great thinkers of the past and present have found reason to believe that mind and consciousness are ubiquitous in nature. This view – panpsychism – presents a fundamental challenge to the dominant religious, scientific, and philosophical views of mind. It argues that mind, or some mind-like quality, is present in all parts of the natural world, even in matter itself. At first glance this is a strange and unsettling idea. What can it mean for insects, trees, rocks, and atoms to possess something mind-like? To be sentient? Or perhaps even to be conscious, in some sense? Is this even conceivable? Are the atoms or cells in my body conscious in some way? If so, how do those consciousnesses relate to 'me'? How can we make sense of such ideas, especially in our modern, rationalist, materialist, objectivist world?

The present work, then, addresses these very questions. The following chapters seek to articulate notions of mind and consciousness under the assumption that panpsychism is a viable and meaningful concept. They move beyond recent efforts to simply defend the concept itself, or to merely show that it is not 'absurd.' They are breaking new ground, and creating new visions of mind and the world. As it has in the past, panpsychism is once again reemerging from the shadows to take an important role in current debates on the nature of mind.

Because of the rather unconventional nature of this subject, it will be helpful to situate the following essays in their proper historical context. Hence this chapter presents a brief overview of the phenomenon of panpsychism, from its beginnings to the current day. Such a short survey is necessarily incomplete; other studies can be found in Griffin's *Unsnarling the World-Knot* (1998), DeQuincey's *Radical Nature* (2002), and Clarke's *Panpsychism and the Religious Attitude* (2003). The most thorough review to date is *Panpsychism in the West* (Skrbina 2005).

1. The ancient world – West and East

Panpsychism was the original – we might say *aboriginal* – conception of mind. As soon as humans conceived of themselves as thinking beings, they recognized such activity mirrored in nature. Forager societies generally lacked any notions of a singular, all-powerful god, but rather saw agency and divinity permeating the natural world.

Foragers seem to have understood that they were animals among animals, creatures of nature, and subject to the same universal cosmic principles as all things. The idea that humans might be fundamentally unique likely never crossed their minds. Such a notion was simply not an element of their worldview. Consequently, minds and spirits abounded. Today this original view is known as animism, a somewhat disparaging term reserved for those 'too primitive to know better.'

With the advent of agriculture some 10,000 years ago, humans came to worship the sun. Now, for the first time, the myriad gods of nature had to be subordinate to one more-powerful, more vital deity. It was self-evident that we were the only species clever enough to harness the sun's energy in this particular way; we stood out from the crowd – special, different, *better*. Such were the beginnings of a journey that culminated in monotheism and human exceptionalism.

But the animistic intuitions of past millennia were deeply embedded and not easily dislodged. The ancient Egyptians had both their sun god and the many gods of nature. Early Hindu thinkers likewise saw mind in nature; the cosmic process of *samsara* recycled spirit throughout the world. Native Americans and Australian aborigines too held to such animistic and pantheistic views.

Amidst this general background of animistic thinking, the culture of ancient Greece arose. It began with Homer (ca. 850 BCE) and Hesiod (ca. 750 BCE), but only took flight with the coming of the first true philosophers: Thales (b. 625 BCE), Pythagoras (b. 570 BCE), Parmenides (b. 515 BCE), and other likeminded thinkers. Given the generally animistic milieu into which the pre-Socratics were born, we should not be surprised to find strong elements of panpsychic thinking in their works. And in fact, we do.

Consider this sampling of ideas from the early Greeks:

- Thales believed that magnetic rocks (lodestones) possessed psyche because they had the power to move small bits of metal.[1] It would be unlikely that only humans (and animals) and magnets possessed such a special quality, and consequently Thales, like others of his day, saw 'gods' and souls in everything: "Certain thinkers say that psyche is intermingled in the whole universe, and it is perhaps for that reason that Thales came to the opinion that all things are full of gods." (Aristotle, *De anima*, 411a7)
- For Pythagoras, all is derived from Number, which was "the principle, source, and root of all things."[2] And "number," according to Aetius, "[is] an equivalent for intelligence." Thus the Pythagorean conclusion that 'everything is intelligent.' Cicero wrote, "Pythagoras...held that soul is extended through all the nature of things and mingled with them..."[3]

1. See Aristotle, *De anima*, 405a19.

2. According to Theon of Smyrna, as cited in Guthrie (1988: 21).

3. Cited in ibid.: 310, 311.

- Parmenides held to a strong form of monism in which Being was the sole reality. Given the undeniable existence of the human mind, he concluded that 'thought' was an essential and inseparable aspect of Being and hence of all that exists: "For it is the same thing to think and to be."[4] That which is, *thinks*.
- Heraclitus viewed the underlying principle of the universe as an "ever-living fire" – *pyr aeizoon*. This life energy sustained all things, and thus everything had a spiritual or psychic quality to it: "all things are full of souls and of divine spirits."[5]
- For Anaxagoras, the fundamental force in the cosmos was Mind (*nous*). Mind had a special involvement with living organisms (humans, animals, plants), but also penetrated into non-living things, making its presence known. Reality itself was thus mind-like and intelligent. Long (1996:131) comments that "Anaxagoras most forcefully...treat[s] intelligent life as basic to reality." Cleve (1969:321) argues that, like most other pre-Socratics, "Anaxagoras, too, is a panzoist, i.e. one to whom body and consciousness are still a unity not yet analyzed. In this respect, he is not different from his predecessors... The notions of a 'matter without consciousness' and a 'consciousness without body' do not yet exist for these men."
- Of all the pre-Socratics, Empedocles most took panpsychism to heart. In his view the universe consisted of four elements – fire, air, earth, and water – organized by two presiding forces: attraction ('Love') and repulsion ('Strife'). The elements were themselves soul-like entities ("Empedocles says that...each of [the elements] actually is a soul" – *De anima*, 404b11), and hence everything composed of them was ensouled. His fragment 110 concludes: "for know that all things have wisdom and a portion of thought."

Such thinking was not limited to Greece. The universalism of panpsychism in the ancient world is attested to by its strong presence in India, China, and Japan, as well as Native American culture. Unlike in the West, panpsychism never receded from these traditions.

Native American panpsychism was linked with a reverential attitude toward nature. Callicott (1982:294) cites J. E. Brown: "All American Indian peoples possessed what has been called a metaphysic of nature; all manifest a reverence for the myriad forms and forces of the natural world specific to their immediate environment." This deep respect toward nature was driven by the notion that natural objects were, like us, sentient and alive in some very real sense. In his examination of the ideas of the Sioux Indian writer John Lame Deer, Callicott observes:

> It would seem that for Lame Deer the "aliveness" of natural entities...means that they have a share in the same consciousness that we human beings enjoy. ... The Indian attitude ... apparently was based upon the consideration that since human

4. Freeman (1948:42). The original passage: "*to gar auto noein estin te kai einai*."

5. Diogenes Laertius, *Lives of the Philosophers*, IX: 5–12. Cited in Smith (1934:13).

> beings have a physical body and an associated consciousness. . ., all other bodily things, animals, plants, and, yes, even stones, were also similar in this respect. (ibid.: 301)

The spirits in individual things, humans included, were seen as offshoots or manifestations of a larger Spirit of the cosmos. Lame Deer describes this notion:

> Nothing is so small and unimportant but it has a spirit given it by Wakan Tanka. 'Tunkan' is what you might call a stone god, but he is also a part of the Great Spirit. The gods are separate beings, but they are all united in Wakan Tanka. It is hard to understand – something like the Holy Trinity. You can't explain it except by going back to the 'circles within circles' idea, the spirit splitting itself up into stones, trees, tiny insects even, making them all *wakan* by his ever-presence. And in turn all these myriad of things which makes up the universe flowing back to their source, united in one Grandfather Spirit. (in Erdoes 1976: 102–103)

The fact that humans, along with all things in nature, participated in the great Spirit provided Native Americans with a way of embedding themselves in nature at a fundamental, ontological level. Humans, to the Indians, were no grand exception in the cosmic scheme; they were not blessed by the Spirit, alone ensouled among the things of the world. Rather, humans were related, in an almost familial way, with all things – hence the constant reference to natural objects as 'brother' or 'sister' or 'mother.' One respected nature as much as one's closest relatives. Native American panpsychism thus had a very practical consequence: a living, functional reverence toward the Earth and all its inhabitants.

Hinduism developed a strikingly similar view. It too was rooted in an ancient animism, but over time evolved into a dominant trinity of gods: Shiva, Vishnu, and Brahma. Some schools of Hindu further consolidated this scheme, arriving at a monotheism of Brahman. As with the Native American view, the human soul was seen as a splinter of the larger spirit of the universe. And, again refuting human exceptionalism, all objects were likewise understood to participate in the cosmic spirit. These ideas are reflected in the Upanishads, most of which date to the two centuries preceding the classical Athenian period (i.e., to roughly 800–600 BCE):

– Katha Upanishad: "Concealed in the heart of all beings is the Atman, the Spirit, the Self; smaller than the smallest atom, greater than the vast spaces." (Mascaro 1965: 59)
– Svetasvatara Upanishad: "There is a Spirit who is hidden in all things, as cream is hidden in milk. . ." (ibid.: 87)
– "God [Brahman] made a bond of love between his soul and the soul of all things." (ibid.: 95)
– Brihad-Aranyaka Upanishad equates (in an ontological sense) the human spirit with those of the sun, moon, lightning, wind, fire, water, and other natural objects. (ibid.: 127–129)

Original Buddhism seems not to have had much connection to panpsychism, but as it migrated into China and Japan it mixed with indigenous ideas about the sacredness of nature. This raised the question of the possible Buddha-nature of animals, plants, and non-living things. Kinsley writes: "A series of Buddhist masters reflected on the question, and increasingly came to conclusions that tend to break down any important distinctions between the human and the nonhuman worlds." (1995: 91). As such, all things participated in the quest for enlightenment, and could thus be seen as manifestations of the *dharmakaya*, the principle or essence of Buddhahood.

This seems to have been emphasized by the Buddhist masters of Japan, especially the Zen school. Kinsley comments on the teachings of Kukai: "Buddhahood is attributed to trees and rocks on the basis of a philosophical principle, namely, that the *dharmakaya* of the Buddha pervades all of nature. That many people don't realize this truth is primarily a problem of human perception." (ibid.: 92). Ryogen argued that the life-process of plants was an indication of their striving for the Buddha-nature. Their efforts at sprouting, growing, reproducing, and finally dying are indicative of "...the way in which plants first aspire for the goal, undergo disciplines, reach enlightenment, and enter into extinction (nirvana). We must, therefore, regard these plants as belonging to the classification of sentient beings." (LaFleur 1989: 190). Soen said: "All beings are flowers, blooming, in a blooming universe." Dogen, in his Zen poetry, wrote: "I came to realize that mind is no other than mountains and rivers and the great wide Earth, the sun and moon and stars."

This Japanese attitude was rooted in an even older animist tradition, as expressed in the Shinto religion. "Nature in Shinto," Kinsley writes, "is enchanted, alive with powerful spirits [*kami*] that express themselves through nature or are identical with it." (p. 91). Not surprisingly, Shinto views nature as sacred in itself, as a physical embodiment of the divine. Shinto is still a living religion in Japan today, though it is practiced by only a small percent of the population.

2. Plato and Aristotle

During the peak of Athenian philosophical development, Plato and Aristotle developed forms of panpsychism that were subtler than their predecessors. For Plato, psyche was an explicitly widespread phenomenon in the cosmos. In addition to humans and other animals he attributes it to the Earth (*Timaeus* 40c), the sun (*Laws* 898d), the stars (*Timaeus* 41e), plants (*Timaeus* 77b), the Form of Being (*Sophist* 249a), and the cosmos as a whole (*Philebus* 30a). In his last work, *Laws*, Plato makes a final declaration on the matter:

> Now consider all the stars and the moon and the years and the months and all the seasons... A soul or souls...have been shown to be the cause of all these phenomena, and whether it is by their living presence in matter...or by some other means,

> we shall insist that these souls are gods. Can anybody admit all this and still put up with people who deny that "everything is full of gods"? (899b)

Plato thus confirms the famous panpsychist statement issued by Thales some 200 years earlier. Gods, souls, psyche pervade the cosmos; they are the cause of all natural phenomena. These souls are perhaps not as complex or as rational as our own, but they are psyche nonetheless.

Aristotle saw psyche as the form of living things (*De anima*, 413a20); nonliving things were considered devoid of soul. Technically, then, Aristotle was not a panpsychist. But he continued to believe that some soul-like entity was necessary in the universe, and that it must reside in all things. It was needed to account, first of all, for the upward-striving tendency of all natural objects; as he said, "For in all things. . .nature always strives after the better." (*On Generation and Corruption*, 336b). In the *Physics* (250b) he described this tendency as "an immortal never-failing property of things that are, a sort of life as it were to all naturally constituted things." In admitting that everything possesses a 'sort of life,' Aristotle tiptoes dangerously close to hylozoism – a form of panpsychism typically considered to characterize his less-sophisticated predecessors.

Heavenly bodies were animate, for Aristotle. His substance-based ontology required a carrier or conduit for this celestial psychic force – which he found in the ether. As a living and divine substance, ether was a self-moving entity that powered the rotation of the heavens. But it acted solely in the celestial sphere. Here on Earth, Aristotle required something else, something "analogous" to the ether that could be the terrestrial carrier of psychic energy.

Thus he arrived at the concept of the pneuma. Pneuma was itself neither mind nor soul, but rather the principle of psychic action. Aristotle describes it as "the faculty of all kinds of soul" and the "principle of soul" (*Generation of Animals*, 736b29). It was in fact a kind of heat-energy that underlay the action of the psyche; he referred to it as *thermoteta psychiken*, a "vital heat" (ibid.). Like the ether in the heavens, pneuma is omnipresent. It accounts for the psyche of living organisms, and the 'sort of life' in nonliving things. It holds things together, and allows them to persist. In a little-known but stunning passage, Aristotle informs us:

> Animals and plants come into being in earth and in liquid, because there is water in earth, and pneuma in water, and in all pneuma is *thermoteta psychiken* (vital heat), so that in a sense all things are full of soul. (ibid.: 762a18)[6]

The last phrase bears repeating: "*all things are full of soul*." Thus we find a quasi-panpsychism in Aristotle, of the sort that few would have expected.

6. In original, the final phrase reads: "*hoste tropon tina panta psyches einai plere*."

3. Hellenism

Epicurean physical theory relied heavily on the atomism of Democritus and Leucippus, but it diverged from them when it came to issues of will, mind, and ethics. The early atomists held to a strict determinism, but this was problematic for Epicurus, as his ethical system demanded the existence of free will. He therefore discarded the determinism by introducing a new factor that he called "swerve" (*parenklisis*). The swerve was due to a tiny amount of free will exhibited by all atoms. This allowed them to initiate contact between one another, leading to a cascading action that resulted in the formation of the complex atomic structures found in everyday objects.

The basic statement of this view is found in Lucretius' *De rerum natura*:

> Though atoms fall straight downward through the void by their own weight, yet at uncertain times and at uncertain points, they swerve a bit... And if they did not swerve...no clashes would occur, no blows befall the atoms; nature would never have made a thing. (Book II, 215–225)

The willful swerving of the atoms is the basis for our own free will: "[Out of the swerve] rises, I say, that *will* torn free from fate, through which we follow wherever pleasure leads, and likewise swerve aside at times and places" (II, 255–260). Human free will cannot arise *ex nihilio* ("since nothing, we see, could be produced from nothing"; 287), and hence must be present in the atoms themselves: "Thus to the atoms we must allow...one more cause of movement [namely, that of free will] – the one whence comes this power we own." (II, 284–286).

Epicurus thus offers a new argument for panpsychism: Humans clearly exhibit will. Will is a fundamental quality of existence, and cannot emerge from non-will. Therefore will is present in the elemental particles of the cosmos, and hence in all things. Variations on this particular argument for panpsychism have proven to be among the more enduring, even through the present day.

The Stoic philosophers – Zeno, Cleanthes, and Chrysippus – adopted many of their predecessors' fundamental assumptions about the nature of being and mind. They accepted Empedocles' four elements and his concept of a material cosmos organized by force principles (in this case, the 'active' and the 'passive'); they adopted the Platonic world-soul, and the Aristotelian notion of form and substance.

Drawing as well on Anaximenes and Aristotle, the pneuma was given a central role. Envisioned as a unity of fire and air, this pneuma was put forth as the creative life energy of the universe. This was most evident in human bodies, in which both warmth (fire) and breath (air) were seen as the essential defining characteristics of life and soul. Pneuma was the active principle made tangible, and as such it accounted for all form that was seen in worldly objects. Pneuma was the 'creative fire' of the cosmos, a *pyr technikon*. It had the status of divinity, and was equated with both god and cosmic reason.

Cicero informs us that the Stoics followed Plato in his attribution of life and mind to the stars: "[T]he cosmos is divine, [and] we should assign the same sort of divinity to the stars… [T]hey too are also said quite correctly to be animals and to perceive and to have intelligence." (Inwood & Gerson 1997: 133). More generally, Cicero states, "the parts of the cosmos…contain the power of sense-perception and reason." Sandbach sees in the Stoic philosopher Posidonius the idea that "a 'life-force' could be recognized everywhere." (1975: 130). The element of fire is the source of this life energy, because "fire has in it a 'vital force'." (ibid.: 134). A. A. Long notes that in the Stoic system "mind and matter are two constituents or attributes of one thing, body, and this analysis applies to human beings as it does to everything else." (1974: 171). All material objects are bodies, and they are in fact "compounds of 'matter' and 'mind' (God or logos). Mind is not something other than body but a necessary constituent of it, the 'reason' in matter". (ibid.: 174).

4. Renaissance naturalism and pansensism

The end of Hellenism and Stoic philosophy coincided with the beginnings of the monotheistic religious worldview. Monotheism was fundamentally opposed to such notions as panpsychism, and thus it is perhaps not surprising that we find relatively little articulation of panpsychist ideas for a number of centuries.

One notable exception was Augustine. In his work *City of God* (circa 410 CE) he further developed Aristotle's ideas on matter. Augustine believed that all natural objects sought their appropriate station in this world in order to preserve and protect themselves:

> [E]ven the lifeless bodies, which want not only sensation but seminal life, yet either seek the upper air or sink deep, or are balanced in an intermediate position, so that they may protect their existence in that situation where they can exist in most accordance with their nature. (Book XI, Chapter 27)

This wanting, or desiring, present in all natural things was a manifestation of *love*:

> If we were stones, or waves, or wind, or flame, or anything of that kind, we should want, indeed, both sensation and life, yet should possess a kind of attraction towards our own proper position and natural order. For the specific gravity of bodies is, as it were, their love, whether they are carried downwards by their weight, or upwards by their levity. (Book XI, Chapter 28)

The next major leap forward in panpsychist philosophy did not occur until the Italian Renaissance. Five of the most important philosophers of that era – Cardano, Telesio, Patrizi, Bruno, and Campanella – were panpsychists. All shared a disdain for the standard theology, all opposed the dominance of Aristotelianism and scholasticism, and all looked to nature for insights into reality.

Cardano's ontological system consisted of a nested hierarchy in which each individual thing was seen as (1) a part (of the larger whole, or One), (2) a unity in itself, and (3) a composition of sub-parts – a view that anticipated the relatively recent work of Koestler, Wilber, and others. The fundamental principle maintaining the unity of each part was *anima*; and the particularly human form of this principle he recognized as 'mind.' As the unifying principle, soul was present in all unities large and small.

Panpsychism followed naturally from this view. In his work *On Subtlety* (1550), Cardano explained the central role of *anima*: "[Material] bodies ... are generated from matter and form, and are controlled by the *anima*, which in the higher types of beings is mind..." (1550/1934: 117). As with the Greeks, Cardano saw soul as the causal source of all motion in the world: "[U]niversally there must exist a certain *anima*...because a source of motion seems to exist in every body whatsoever..." (ibid.: 87). In a break from the ancient view, he argued against the designation of fire as an element. To him, fire is heat, the active principle, which acts on the passive to produce form. This is a general ontological principle, and hence, "all permanent bodies, including stones, are always slightly moist and warm and of necessity animate." (Fierz 1983: 66).

Bernardino Telesio developed a panpsychist philosophy that had a lasting influence in Western philosophy, primarily through the works of Bruno, Campanella, Bacon, and Hobbes. Like Empedocles, Telesio saw two fundamental and opposing forces in the universe, an expanding and motive principle that he called *heat*, and a contracting principle, *cold*. These forces displayed the notable quality of *perception*. Heat sought to 'stay warm' and cold sought to 'stay cool,' and this tendency Telesio interpreted as a kind of sensation or knowledge. As he wrote, "It is quite evident that nature is propelled by self-interest." (1586/1967: 304). And since heat and cold inhered in all things, all things shared in this ability to sense. Thus his position is sometimes referred to as *pansensism*, a particular form of panpsychism.

Francesco Patrizi also sought to undermine the dominant Aristotelian scholasticism, and place greater emphasis on Plato's philosophy. His chief work, *New Philosophy of the Universe* (1591), laid out a complete cosmological system that introduced the term 'panpsychism' into the Western vocabulary. Patrizi created a 9-level hierarchical system of being, with *anima* at the center. As such it permeated all levels, existing simultaneously at the level of a world-soul, a human soul, and soul of inanimate things. He "does not treat the individual souls as [mere] parts of the world soul, but believes, rather, that their relation to their bodies is analogous to that of the world soul to the universe as a whole." (Kristeller 1964: 122).

Like other Renaissance naturalists, Giordano Bruno endorsed the idea of God as a world-soul, and then articulated a general concept of the soul as dwelling in all things; this, he felt, was required to maintain a consistent ontology. He was very explicit about his panpsychist views, and even acknowledged their unconventionality. Responding to the obvious claim – "Common sense tells us that not everything is alive" – Bruno replies, "But who could reasonably refute it?" (1584/1998: 42). His argument proceeds on the assumption that the same principles must apply throughout the cosmos. The Earth held no privileged position in the universe (such as being at the center), and humans held no privilege with respect to possessing a soul. He took the world-soul and the human soul as given, and concluded that all things, all parts of the cosmic whole, must be animated: "[N]ot only the form of the universe, but also all the forms of natural things are souls." Elaborating, he adds, "there is nothing that does not possess a soul and that has no vital principle" (ibid.: 43).

Initiating a distinction that would become influential for Leibniz and the process philosophers, Bruno argued that ordinary nonliving objects – shoes, tables, chairs – are not animate as wholes, but rather that they contain vital elements within themselves:

> I say, then, that the table is not animated as a table, nor are the clothes as clothes...but that, as natural things and composites, they have within them matter and form [i.e. soul]. All things, no matter how small and miniscule, have in them part of that spiritual substance... [F]or in all things there is spirit, and there is not the least corpuscle that does not contain within itself some portion that may animate it. (ibid.: 44)

Tommaso Campanella's philosophical system centers on his doctrine of the "three primalities": *power*, *wisdom* (or knowledge, or sense), and *love* (or will). Deriving from God himself, these qualities reside in all created things; the latter two are key to Campanella's panpsychist outlook. Wisdom is manifest as knowledge, which is first and foremost a knowledge of oneself. Each thing knows of its own existence, and its own persistence over time: "All things have the sensation of their own being and of their conservation. They exist, are conserved, operate, and act because they know." (1638/1969: 156).

Knowing of their own existence, things naturally love it. Drawing from Augustine, Campanella argued that all things express a manifest desire to persist – a love of self. They can only do so by perceiving the world around them and then reacting accordingly. Hence the subtitle of Campanella's central work *De sensu rerum:*

> A remarkable tract of occult philosophy in which the world is shown to be a living and truly conscious image of God, and all its parts and particles thereof to be endowed with sense perception, some more clearly, some more obscurely, to the extent required for the preservation of themselves and of the whole in which they share sensation. (1620/1969: 156)

Not content to rest on such 'first principles' declarations, he resurrected the Epicurean argument that *like comes from like*, i.e. that emergence of mind is impossible:

> Now, if the animals are sentient...and sense does not come from nothing, the elements whereby they and everything else are brought into being must be said to be sentient, because what the result has the cause must have. Therefore the heavens are sentient, and so [too] the earth... (1620, in Dooley 1995: 39)

5. Developments in continental philosophy – Spinoza and Leibniz

The two great panpsychists of the 17th century were Spinoza and Leibniz. Spinoza created a radical monism in which the one real substance was that which he identified as "God or Nature." Recognizing mental and physical phenomenon as fundamental aspects of reality, he declared that these two attributes – thought and extension – are the only knowable of infinitely many attributes of the one God/Nature. Particular objects, and particular thoughts and mental states, were thus seen as 'modes' of the corresponding attribute.

Since every object is a part of God/Nature, every object must embody all its attributes – and in particular, the attributes of extension and thought. Each real thing must exist both as a 'mode of extension' (as a physical body) and as a 'mode of thought' (which Spinoza called an "idea"). Thus every object both has (or is) a body and also has (or is) a corresponding idea.

Obviously this applies to the human being. Our physical body is our mode of extension, and our 'idea' or mode of thought is nothing other than our *mind*. Furthermore the human being has no special ontological status; we are objects in the world not fundamentally different from every other object. But this leads to a striking conclusion: If all things have 'ideas,' and if an idea corresponds to a mind, then all things have minds:

> For the things we have shown so far are completely general and do not pertain more to man than to other individuals, all of which, though in different degrees, are nevertheless animate. ... [W]hatever we have asserted of the idea [i.e. mind] of the human body must necessarily also be asserted of the idea of everything else.
> (*Ethics*, II Prop 13, Scholium)

The greater the complexity of interaction with the world that a given object has, the greater the complexity of the corresponding mind. Humans have richer interaction with the world and hence a more articulated mind, but no object is so simple that it is completely mindless.

Leibniz's panpsychism rested upon his theory of the *monads* – atom-like constituents of reality that possessed a number of mind-like characteristics. First, each monad is utterly unique in that it represents a distinct perspective or outlook on the universe. The dynamism of the universe is reflected as an internal dynamism, a *living quality*, within each monad. As Leibniz explained: "Each monad is a living mirror...which represents the universe from its own point of view, and is as ordered as the universe itself." (*Monadology*, 1714, sec. 3).

Second, the internal ordering of the monads is to be understood as embodying two primary qualities: *perception* and *appetite* (or desire). Perceptions are the changing internal states of the monads, and these changes are brought about by the monad's appetites – a compelling desire to reflect the universe.

The strongly animistic tone of the terms 'perception' and 'appetite' is not coincidental, because each monad is identified with a *soul*. The connection of soul with some point-like entity comes from the earliest parts of Leibniz's philosophy (even prior to his usage of 'monad'), but did not become fully developed until the late 1690s. He wrote:

> [I]n order to find these *real unities*, I was forced to have recourse to a *real and animated point*, so to speak, or to an atom of substance which must include some-

> thing of form or activity to make a complete being. . . . I found that [the monad's] nature consists in force, and that from this there follows something analogous to sensation [i.e. perception] and appetite, so that we must conceive of them on the model of the notion we have of *souls*. (1695/1989: 139)

> We could call them *metaphysical points*: they have *something vital*, a kind of *perception*, and [as] *mathematical points* are the *points of view* from which they express the universe. (ibid.: 142)

The final key characteristic of the monad is that it is, above all, a *unity*. Monads themselves are unities, but so too, in a different way, are collections of monads. Any material object is a collection of monads, and is integrated by the action of a "dominant monad" which represents the integrated unity of the object. It was via the dominant monad that Leibniz attempted to solve the 'combination problem' – of unifying disparate small minds into a single higher-order mind.

On this matter of unity Leibniz, following Bruno, made an important distinction between objects with a truly organic sense of unity and those that were mere sets, collections, or aggregations of distinct things. Aggregates such as "an army or a flock," or "a heap of stones" do not possess a dominant monad and thus no unified mind. Interestingly, Leibniz never gave a formal definition as to what qualifies as a group and what defines a true individual; all he offered was this ambiguous phrase: "substantial unity requires a thoroughly indivisible and naturally indestructible being" (1686/1989: 79). Even such an apparently unified object as "a block of marble" is not a true individual, but rather is "only like a pile of stones," that is, only exists as a unity in the mind of an observer, not in reality (because it is divisible and destructible).

Also of interest is Leibniz's rare mention of ambiguous cases of substantial unity, like plants and ecosystems. In one of his few discussions of the topic, he deferred on an answer: "about the sun, the earthly globe, the moon, trees, and other similar bodies. . .I cannot be absolutely certain whether they are animated, or even whether they are [true] substances. . ." (ibid.: 80). This has continued to be a central philosophical problem, even down to the present day. Modern process philosophers still struggle with the notion of unity, and object-oriented ontologies work to define the metaphysical status of an 'object.'

Though they dominated philosophical discourse, Spinoza and Leibniz were not the only panpsychist thinkers of that era. French philosophers like LaMettrie, Maupertuis, and Diderot were at the forefront of the new humanism of the Enlightenment. In a universe without God or a supernatural soul, they still had to account for the presence of mind. Their conclusion: that matter itself had inherent mental qualities. They were materialists, but of the *vitalistic* sort. Such a view stands in notable contrast to the modern, mechanistic brand of materialism.

The organizational complexity of our bodies allowed sentient matter to express itself in complex and sophisticated ways. LaMettrie wrote that even human consciousness "is no more foreign to matter than thought is. . ." Regarding the complex human mind, he asks: "Is organization sufficient for everything? Yes, once again."

(1747/1994: 59). For Maupertuis, "attraction" and "intelligence" were essential properties of matter; these became manifest as desire, aversion, and memory – qualities present in all things. Diderot made frequent reference to "the general sensitivity of matter." "This faculty of sensation," he wrote, "is a general and essential quality of matter." (1769/1937: 49). Elaborating on this thought: "[f]rom the elephant to the flea, from the flea to the sensitive living atom, the origin of all, there is no point in nature but suffers and enjoys." (ibid.: 80).

Diderot went further, tackling the combination problem and the unity of mind. On his view, if particles of matter are sensitive and intelligent, then simply by virtue of communication and contact they can form an integrated being. He made an analogy with a swarm of bees: "This cluster is a being, an individual, an animal of sorts." (ibid.: 67). It is a unitary being because of the extremely tight interaction between parts, which pass from being merely "contiguous" into being truly "continuous." The human body is similar to the swarm of bees; the body is a collection of organs, which "are just separate animals held together by the law of continuity in a general sympathy, unity, and identity." It is the "continual action and reaction" between parts that creates the unity; "contact, in itself, is enough" (ibid.: 76).

6. The German philosopher-scientists

In the century following the French Enlightenment, panpsychist thought developed most rapidly in Germany. The one hundred years from 1780 to 1880 were marked by the emergence of several major German philosophers articulating panpsychist views – the first among whom was Johann Herder. Herder sought to unify the diversity of physical forces (gravity, electricity, magnetism, light) under the framework of a single fundamental force, *Kraft*. As the ultimate reality, *Kraft* had to account both for physical forces and those of life and mind. Nisbet (1970: 11) remarks that Herder "represents the *Kräfte* of plants and stones as analogous to the soul. ... [E]ach endowed with a different degree of consciousness..." In the mid-1780s Herder wrote:

> All active forces of Nature are, each in its own way, alive; in their interior there must be Something that corresponds to their effects without – as Leibniz himself assumed... (in Clark 1955: 311)

Arthur Schopenhauer's masterwork, *The World as Will and Idea* (1819), describes a two-fold system of reality. On the one hand it is a theory of classical idealism; objects are grasped from without as collections of sensory images or phenomena, and in this sense are aspects of mind. On the other hand, there must also be an interior to things, an intrinsic nature which is invisible to outside observers and which must compose the ultimate reality of things.

The intrinsic nature of physical objects, Schopenhauer said, is directly perceivable only in one very special case: our own bodies. We know the thing-in-itself of our own bodies because we *are* that thing. On the 'inside' we are desire, feeling, emotion: in short, *will*. But the human body has no special ontological standing; it is a physical object like all objects. Therefore, whatever inner nature we have must be realized to some degree in all things. The thing-in-itself of *all* objects, he concluded, is nothing more than will. This thing-in-itself is the complementary aspect to the extrinsic phenomenal reality: "For as the world is in one aspect entirely *idea*, so in another it is entirely *will*." (1819/1995: 5). If all things are, intrinsically, will, then all things have an aspect of mentality – a clear panpsychist philosophy.

Schopenhauer addressed two general categories of physical entities: objects and forces. Regarding the former, material objects were seen by him as literally "objectifications of will," that is, as physical manifestations or 'solidifications' of it. This was true for the human body, for individual organs, for non-human animals, and even for nonliving entities. Objectification occurs in varying degrees throughout nature, and generally corresponds to the complexity of the object.

Regarding physical forces, Schopenhauer, following and extending the ideas of Herder, described all of them as manifestations of will:

> The force which stirs and vegetates in the plant, and indeed the force by which the crystal is formed, that by which the magnet turns to the North Pole, the force whose shock [results] from the contact between different metals, ...even gravitation, ...all these [are recognized] as in their inner nature...identical [to that] which is called *will*. . . . [The will] is manifest in every force of nature that operates blindly, and it is manifest, too, in the deliberate action of man; and the great difference between these two is a matter only of degree of the manifestation, not in the nature of what is made manifest. (1819/1995: 42)

As with objects, physical forces are objectifications of will, albeit at a very basic level: "The most universal forces of nature present themselves as the lowest grade of the will's objectification." (ibid.: 61). Some years later he added, "generally every original force manifesting itself in physical and chemical appearances, in fact gravity itself – all these in themselves...are absolutely identical with what we find in ourselves as *will*." (1836/1993: 20).

Thus, with his monistic idealism Schopenhauer was able to persuasively argue that mind in fact existed everywhere in nature:

> Now if you suppose the existence of a *mind* in the human head, ...you are bound to concede a mind to every stone. ... [A]ll ostensible mind can be attributed to matter, but all matter can likewise be attributed to mind; from which it follows that the antithesis [between mind and matter] is a false one. (1851/1974: 212–213)

Numerous other German thinkers echoed the panpsychist sympathies of that age. Among these:

– *Wolfgang von Goethe*, on the connection between mind and matter: "Since, however, matter can never exist and act without spirit [*Seele*], nor spirit without matter, matter is also capable of undergoing intensification, and spirit cannot be denied its attraction and repulsion." (1828/1988: 6).

- *Gustav Fechner*, on the psyche of plants: "If we take a cursory glance at some of the outstanding points, is not the plant quite as well organized as the animal, though on a different plan, a plan entirely of its own, perfectly consonant with its idea? If one will not venture to deny that the plant has a life, why deny it a soul? For it is much simpler to think that a different plan of bodily organization built upon the common basis of life indicates only a different plan of psychic organization. . . . [W]hether it be a plant or an animal, the complexity of structure and process is so completely analogous, except that the cells are differently arranged. . ." (1848/1946: 168–169).
- *Herman Lotze*, on the sentience of atoms: "The indivisible unity of each of these simple beings [atoms] permits us to suppose that in it the impressions reaching it from without are condensed into modes of sensation and enjoyment. [As a result,] no part of being is any longer devoid of life and animation. . . . We must...in general allow and maintain that all motion of matter in space may be explained as the natural expression of the inner states of beings that seek or avoid one another with a feeling of their need..." (1856–64/1971: 360–363).
- *Eduard von Hartmann*, on the unity of mind and matter: "Hencewith is the radical distinction between spirit and matter abolished; their difference consists only in higher or lower forms of manifestations of the same essence... The identity of mind and matter [becomes] elevated to a scientific cognition, and that, too, not by killing the spirit but by vivifying matter." (1869/1950, vol. 2: 180).
- *Ernst Mach*, on the inadequacies of both mechanistic materialism and primitive animism: "But now...our judgment has grown more sober... Both [the mechanical and animistic mythologies] contain undue and fantastical exaggerations of an incomplete perception. Careful physical research will lead...to an analysis of our sensations. We shall then discover that our hunger is not so essentially different from the tendency of sulphuric acid for zinc, and our will not so greatly different from the pressure of a stone, as now appears. We shall again feel ourselves nearer nature, without its being necessary that we should resolve ourselves into a nebulous and mystical mass of molecules, or make nature a haunt of hobgoblins." (1883/1974: 560).

The reign of German panpsychists concluded with two influential figures, Haeckel and Nietzsche. Haeckel was among the first philosophers to take up the notion of evolution and build it into a comprehensive metaphysical system. Evolution demonstrated the continuity of all beings, and strongly argued against the radical emergence of wholly new qualities like mind or sentience. As a consequence, the case for monism strengthened considerably, as it did for panpsychism: "One highly important principle of my monism seems to me to be, that I regard *all* matter as *ensouled*, that is to say as endowed with *feeling* (pleasure and pain) and *motion*. . ." (1892: 486). Later Haeckel observed, "Our conception of Monism. . .is clear and unambiguous; . . .an immaterial living spirit is just as unthinkable as a dead, spiritless material; the two are inseparably combined in every atom." (1895: 58).

In his most famous work, *The Riddle of the Universe* (1899), Haeckel argued that science had proven the unity of matter and energy. He then equated mass with 'body', energy with 'spirit', and then united these two pairs in an explicitly Spinozan manner. Haeckel claimed that all living creatures, microbes included, possess "conscious psychic action." The inorganic world also possesses an inherent psychic quality, though he takes care to emphasize that this is unconscious rather than conscious mentality. This applies even to the atoms: "I conceive the elementary psychic qualities of sensation and will, which may be attributed to atoms, to be *unconscious*..." (1899/1929: 179). Near the end of his life he proposed that, in addition to matter and force, the one monistic reality be attributed a third characteristic called *psychoma*, or "general sensation." The result was a three-way identity: "(1) No matter without force and without sensation. (2) No force without matter and without sensation. (3) No sensation without matter and without force." (1904: 465).

Nietzsche spent most of his effort characterizing (and criticizing) the human condition. The defining concept for humanity was the *will to power* – a life-affirming drive toward dignity, self-mastery, and greatness. But the will to power was not limited to the human sphere; it was rather a universal metaphysical principle. As it was for Schopenhauer (whom Nietzsche admired), this will was manifest in all forces and all objects of the world. In his 1886 masterpiece *Beyond Good and Evil*, he wrote:

> Granted finally that one succeeded in explaining our entire instinctual life as the development and ramification of *one* basic form of will – as will to power, as is *my* theory –...[then] one would have acquired the right to define *all* efficient force unequivocally as: *will to power*. The world seen from within, the world described and defined according to its 'intelligible character' – it would be 'will to power' and nothing else. (sec. 36)

Further elaboration came from his notebook entries that were eventually published as *The Will to Power* (1906):

> The victorious concept 'force'...still needs to be completed: an inner will must be ascribed to it, which I designate as "will to power," i.e. as an insatiable desire to manifest power; ...[and] as a creative drive.... [O]ne is obliged to understand all motion, all 'appearances,' all 'laws,' only as symptoms of an inner event, and to employ man as an analogy to this end. (sec. 619)

> *This world is the will to power – and nothing more*! And you yourselves are also this will to power – and nothing more! (sec. 1067)

> 'Attraction' and 'repulsion' in a purely mechanistic sense are complete fictions: a word. We cannot think of an attraction divorced from an intention. The will to take possession of a thing or to defend oneself against it and repel it – that we 'understand'... (sec. 627)

> My idea is that every specific body strives to become master over all space and to extend its force (–its will to power) and to thrust back all that resists its extension. (sec. 636)

> [My theory would be] that all driving force is will to power, that there is no other physical, dynamic or psychic force except this. (sec. 688)

> [T]he innermost essence of being is will to power… (sec. 693)

7. Anglo-American panpsychism

Until the late 19th century there were few panpsychists among English or American philosophers. In the mid-1600s Henry More's "Spirit of Nature" and Margaret Cavendish's organicist materialism each contained panpsychist ideas, as did Joseph Priestley's dynamism of the late 1700s. But panpsychism within the English-speaking world did not really develop until the work of William Kingdon Clifford in the 1870s. Clifford wrote two influential articles, "Body and mind" (1874) and "On the nature of things in themselves" (1878), that argued for a 'mind-stuff' form of panpsychism. The former article established Clifford's belief in a form of Spinozist parallelism. He cites evolutionary continuity in arguing that there is no point in the chain of material organization at which mind can be conceived to suddenly appear:

> [I]t is impossible for anybody to point out the particular place...where [emergence of consciousness] can be supposed to have taken place. ... [E]ven in the very lowest organisms, even in the Amoeba...there is something or other, inconceivably simple to us, which is of the same nature with our own consciousness... [Furthermore] we cannot stop at organic matter, [but] we are obliged to assume...that along with every motion of matter, whether organic or inorganic, there is some fact which corresponds to the mental fact in ourselves. (1874/1903: 60–61)

Echoing Fechner and Bruno, he notes that this doctrine "is no mere speculation, but is a result to which all the greatest minds that have studied this question in the right way have gradually been approximating for a long time." (ibid.)

Shortly thereafter, British essayist Samuel Butler acknowledged the discovery that living and nonliving things were composed of precisely the same elements and forces; he wrote, "if we once break down the wall of partition between the organic and inorganic, the inorganic must be living and conscious also, up to a point." In a nod to the inherent difficulties in conceiving of emergence of mind, he added:

> [I]t is more coherent with our other ideas, and therefore more acceptable, to start with every molecule as a living thing...than to start with inanimate molecules and smuggle life into them; ... what we call the inorganic world must be regarded as up to a certain point living, and instinct, within certain limits, with consciousness, volition, and power of concerted action. (1880: 23)

Related sympathies could be found in the contemporary works of Spencer (1884) and Prince (1885).

Within a few years William James began his inquiry into panpsychism. His *Principles of Psychology* (1890) devotes a full chapter to Clifford's mind-stuff theory, and displays notable sympathy to the view. James asserts that the theory of evolution provides among the strongest evidence yet:

> *If evolution is to work smoothly, consciousness in some shape must have been present at the very origin of things.* … Some such doctrine of *atomistic hylozoism*. . .is an indispensable part of a thorough-going philosophy of evolution.
>
> (1890/1950: 149)

Over the next 15 years James gradually increased his commitment to panpsychism. In his Gifford Lectures of 1901–2 he asked: "How could the richer animistic aspects of Nature. . .fail to have been first singled out and followed by philosophy as the more promising avenue to the knowledge of Nature's life?" (1902: 392). He continued:

> A conscious field *plus* its object as felt or thought of *plus* an attitude toward the object *plus* the sense of a self to whom the attitude belongs [constitutes a] full fact...; it is of the *kind* to which all realities whatsoever must belong...
>
> (ibid.: 393)

His first outright endorsement of panpsychism came in his Harvard lecture notes of 1902–3, in which he noted "pragmatism would be [my] method and 'pluralistic panpsychism' [my] doctrine." (in Perry 1935: 373). His 1904–5 lectures addressed mind-matter causality, leading

> into that region of pan-psychic and ontologic speculation of which [panpsychists] Professors Bergson and Strong have lately [addressed] in so able and interesting a way. ... I cannot help suspecting that the direction of their work is very promising. . . . (1912/1996: 189)

And again in his 1905–6 lecture notes: "Our only intelligible notion of an object *in itself* is that it should be an object *for* itself, and this lands us in panpsychism and a belief that our physical perceptions are effects on us of 'psychical' realities..." (in Perry 1935: 446).

James arrived at a clear and unambiguous position by the time of his Hibbert Lectures of 1907 (published in 1909 as *A Pluralistic Universe*). He explained that his theory of radical empiricism is a form of 'pluralist monism' in which all things are both 'pure experience' and 'for themselves', i.e. are objects with their own independent psychical perspectives. One lecture (chapter) is dedicated to a sympathetic reading of Fechner's system of a cosmic hierarchy of mind – something that he clearly endorses:

> [T]he whole human and animal kingdoms come together as conditions of a consciousness of still wider scope. This combines in the soul of the earth with the consciousness of the vegetable kingdom, which in turn contributes. . .to that of the whole solar system, and so on from synthesis to synthesis and height to height, till an absolutely universal consciousness is reached. (1909/1996: 155–156)

Another gives James' final stance on the combination problem: "the self-compounding of mind in its smaller and more accessible portions seems a certain fact." (p. 292). The conclusion is that "we finite minds may simultaneously be co-conscious with one another in a super-human intelligence." In the final lecture he clearly stated his belief in a 'superhuman consciousness' and in "a general view of the world almost identical with Fechner's." (pp. 309–310). He saw in this a new worldview, a sea-change in philosophy, "a great empirical movement towards a pluralistic panpsychic view of the universe" (p. 313).

The 19th-century closed with three notable works. First was Paul Carus' article in *Monist*, "Panpsychism and panbiotism" (1892). Carus critically assessed Haeckel's views, laying out his own vision that "everything is fraught with life." The article included a fascinating reprint of a short essay on, of all things, "Mr. Thomas A. Edison's panpsychism."

Next was Josiah Royce's book *Spirit of Modern Philosophy*, in which he introduced a form of panpsychism based on absolute idealism. Supplementing Schopenhauer's insight with evolutionary theory, he argued that if humans possess an inner reality then so too must all things:

> The theory of the 'double aspect,' applied to the facts of the inorganic world, suggests at once that they, too, in so far as they are real, must possess their own inner and appreciable aspect. ... In general it is an obvious corollary of all that we have been saying. (1892: 419–420)

Elaborating this idea a few years later, he wrote:

> [W]e have no sort of right to speak in any way as if the inner experience behind any fact of nature were of a grade lower than ours, or less conscious, or less rational, or more atomic. ... [T]his reality is, like that of our own experience, conscious, organic, full of clear contrasts, rational, definite. We ought not to speak of dead nature. (1898/1915: 230)

The third item was Charles Sanders Peirce's article "Man's glassy essence." This built upon his declaration of the previous year in which he defined "matter as effete mind" – a system he called *objective idealism*. He observes that living tissue and cell matter display clear signs of sensitivity and feeling, and indeed "all the functions of mind." (1892/1992: 343). But these things are only complex chemistry; therefore, we must "admit that physical events are but degraded or undeveloped forms of psychical events." (p. 348). Under these conditions the only coherent metaphysical system is a panpsychist dual-aspect theory of mind:

> [A]ll mind is directly or indirectly connected with all matter, and acts in a more or less regular way; so that all mind more or less partakes of the nature of matter. ... Viewing a thing from the outside, ...it appears as matter. Viewing it from the inside, ...it appears as consciousness. (p. 349)

8. Process philosophy in the early 20th century

Modern process philosophy is closely identified with the work of Whitehead, but in fact it draws as much from the insights of Leibniz, James, Peirce, and Bergson. A contemporary of James and Pierce, Henri Bergson stressed the importance of time as a fundamental metaphysical entity. Bergson's sympathies toward panpsychism began with *Matter and Memory* (1896) but did not really develop until *Creative Evolution* (1907). His main thesis – that matter is "the lowest degree of mind" – clearly echoes Peirce. In the manner of Schopenhauer, Bergson offers that "pure willing [is the] current that runs through matter, communicating life to it" (1907/1911: 206). But Bergson's clearest statement came in *Duration and Simultaneity* (1922). Here he achieved a true process philosophy in which all physical events contain a memory of the past. Given his earlier insistence that memory is an essential component of mind, one arrives at the conclusion that mind is in all things:

> What we wish to establish is that we cannot speak of a reality that endures without inserting consciousness into it. . . . [I]t is impossible to imagine or conceive a connecting link between the before and after without an element of memory and, consequently, of consciousness.
>
> We may perhaps feel averse to the use of the word "consciousness" if an anthropomorphic sense is attached to it. [But] there is no need to take one's own memory and transport it, even attenuated, into the interior of the thing. . . . It is the opposite course we must follow. . . . [D]uration is essentially a continuation of what no longer exists into what does exist. This is real time, perceived and lived. . . . Duration therefore implies consciousness; and we place consciousness at the heart of things for the very reason that we credit them with a time that endures.
> (1922/1965: 48–49)

Regarding this view, Capek (1971: 308) noted, "there is no question that [Bergson] regarded physical events as 'proto-mental' entities."

'New realist' Samuel Alexander was also supportive of process thinking. He claimed that there were six levels of emergence in evolution – Space-Time, primary qualities, secondary qualities, life, animal mind, and Deity – and that each level served as 'mind' to the preceding level. This notion is advanced in *Space, Time, and Deity* (1920). Alexander wrote:

> For though matter has no life, it has something which plays in it the part which life plays in the living organism and mind plays in the person; and even on the lowest level of existence [i.e. motion], any motion has its soul, which is time. Thus matter is not merely dead as if there was nothing in it akin to life. It is only dead in that it is not as alive as organisms are. . . . [W]e are compelled to the conclusion that all finite existence is alive, or in a certain sense animated. (vol. II, p. 67)

Hence "there is nothing dead, or senseless in the universe, [even] Space-Time itself being animated" (ibid.: 69).

As the most prominent of process philosophers, Whitehead's views on mind and reality are relatively well-known. Even in the first of his metaphysical books, *Science and the Modern World* (1925), he exhibits sympathies to panpsychism. Here he lays out his 'philosophy of the organism' that encompasses a nested hierarchy of parts and wholes, and also reflects mind-like qualities at all levels. "If," he says, "you start from the immediate facts of our psychological experience," and accept that there are "no arbitrary breaks" in nature, then "you are led to the organic conception of nature" (p. 73). And by 'organic' he was explicit that this is to include "the organic unities of electrons, protons, molecules, and living bodies." This places mind or mentality at the center of existence: "cognitive mentality is in some way inextricably concerned in every detail." (p. 90).

Events in nature are described as "actual occasions." In its complete form, such an event "includes that which in cognitive experience takes the form of memory, anticipation, imagination, and thought." (p. 170). If all actual occasions are 'complete,' then presumably all would have memory, thought, and so on. Later Whitehead described such events or occasions as *dipolar* in nature – containing both physical and mental stages. By the mid-1920s his position was clear: *all* natural events are dipolar, and thus *all* events possess a mental aspect; "panpsychism is clearly affirmed in the sense that every actuality has mentality." (Ford 1995: 28).

In *Modes of Thought* (1938: 156) Whitehead offers this passage:

> [T]his sharp division between mentality and nature has no ground in our fundamental observation. ... I conclude that we should conceive mental operations as among the factors which make up the constitution of nature.

As the ultimate reality, these mental/physical events reflect a panpsychic universe in which, furthermore, all events are interconnected: "There is no such mode of ["independent"] existence; every entity is only to be understood in terms of the way in which it is interwoven with the rest of the Universe." (1941: 687).

Like Whitehead, Bertrand Russell held (at least for most of his career) to a neutral monist view in which events were the primary reality. This allows a bridging of the mind-matter gap: "matter is less material, and mind less mental, than is commonly supposed." (1927a: 7). In themselves, these events are to be seen as sense-datum or 'percepts': "As to what the events are that compose the physical world, they are, in the first place, percepts, and then [secondarily] whatever can be inferred from percepts..." (p. 386). He added: "mental events are part of that stuff [of the world], and...the rest of the stuff resembles them more than it resembles traditional billiard-balls" (p. 388).

Other of Russell's writings were suggestive of panpsychism. He wrote: "My own feeling is that there is not a sharp line, but a difference of degree [between mind and matter]; an oyster is less mental than a man, but not wholly un-mental." (1927b: 209). Part of the reason why we cannot draw a line, he said, is that an essential aspect of mind is *memory*, and a memory of sorts is displayed even by inanimate objects: "we cannot, on this ground [of memory], erect an absolute barrier between mind and matter. ...

[I]nanimate matter, to some slight extent, shows analogous behavior" (p. 306). Russell concludes, in an Epicurean vein:

> The events that happen in our minds are part of the course of nature, and we do not know that the events which happen elsewhere are of a totally different kind. The physical world...is perhaps less rigidly determined by causal laws than it was thought to be; one might, more or less fancifully, attribute even to the atom a kind of limited free will. (p. 311)

Perhaps his clearest statement came near the end of his writing career, in his 1956 book *Portraits from Memory*. Again the notion of memory is key. Memory is "the most essential characteristic of mind, ...using this word in its broadest sense to include every influence of past experience on present reactions." (pp. 153–154). He observes that this generalized conception of memory must apply, properly speaking, to all physical objects and systems.

> This [memory] also can be illustrated in a lesser degree by the behavior of inorganic matter. A watercourse which at most times is dry gradually wears a channel down a gully at the times when it flows, and subsequent rains follow [a similar] course... You may say, if you like, that the river bed 'remembers' previous occasions when it experienced cooling streams. ... You would say [this] was a flight of fancy because you are of the opinion that rivers and river beds do not 'think.' But if thinking consists of certain modifications of behavior owing to former occurrences, then we shall have to say that the river bed thinks, though its thinking is somewhat rudimentary. (p. 155)

Apart from Whitehead and Russell, the other widely-known process philosopher of the 20th century was Charles Hartshorne. His panpsychist outlook was evident in his first major work, *Beyond Humanism* (1937). The book includes a critique of science and the scientific method, which, Hartshorne says, treats objects in nature not as individuals but as crowds, swarms, and aggregates. Mind and sentience are not to be found in aggregates, but only in true individuals, and thus science overlooks the possibility of panpsychism – interpreted as meaning 'all true individuals possess minds.'

Apart from the problem of aggregates, Hartshorne tackled the issue of 'proving' panpsychism. Rather than attempting this directly, he turned the question around. He asked: Can science, which is in the business of proofs, *disprove* panpsychism? His answer was 'no,' both because science treats things primarily in aggregate form, but also because it cannot distinguish the fact *that* an object feels from *how* it feels. He went on to explain that philosophical reasoning offers no inherent basis for rejecting panpsychism. Quite the contrary: there are "great philosophical advantages" (1937: 175) to it, including explaining the relation between sensation and feeling, and deeper comprehension of the concepts of space and time. As he stated: "the idea of time is unintelligible unless panpsychism is true" (p. 174), relying on a Bergsonian argument for memory in all aspects of reality.

Hartshorne claimed that organic sympathy (and the accompanying panpsychism) is capable of resolving six major philosophical problems: mind-body, subject-object, causality, the nature of time, the nature of individuality, and the problem of knowledge. Very briefly: The human mind results from a "sympathetic participation" or rapport with the sentient cells of the body – whose sentience is itself a product of the rapport with sentient atoms. The relation of subject to object is similarly an exchange between enminded participants, without which knowledge would be impossible. More generally, all causality is manifested through such a resonance between two minds. Moments in time are a "sympathetic bond" between past and future, much as Bergson and Whitehead described. The 'individual' is a result of a balance between the integrative power of sympathy and the disintegrative power of its opposite, antipathy; in the manner of Empedocles, Hartshorne noted that pure sympathy would destroy individuality (by merging all into one), and pure antipathy would not allow for any structure or knowledge at all.

In the final analysis Hartshorne concluded that panpsychism (or 'psychicalism,' as he prefers) has little direct bearing on matters of science *per se* but does profoundly influence our human attitudes, and consequently our actions. "For logical, aesthetic, and religious reasons our view of the general [panpsychic] cosmic status of quality (and value) influences our behavior, and in this sense its consideration is pragmatically significant." (1990: 397). It is, after all, the most viable ontology available to us – certainly preferable to an utterly unintelligible materialism: "the concept of 'mere dead insentient matter' is an appeal to invincible ignorance. At no time will this expression ever constitute knowledge." (1977: 95).

9. Late 20th century panpsychism

Continuing the line of panpsychist theologian-philosophers that ran from Augustine and Francis through Campanella and Hartshorne was Pierre Teilhard de Chardin. Drawing on Bergson and Schiller, Teilhard described a picture of cosmic evolution in which matter undergoes a continual process of complexification of structure and, correspondingly, of mind and spirit. In his *Phenomenon of Man* (1959) he argued that "there is necessarily a double aspect to [matter's] structure... [C]o-extensive with their Without, there is a Within to things." (p. 56). Thus he arrives at a panpsychic cosmos:

> [W]e are logically forced to assume the existence in rudimentary form...of some sort of psyche in every corpuscle, even in those (the mega-molecules and below) whose complexity is of such a low or modest order as to render it (the psyche) imperceptible... [T]he universe is, both on the whole and at each of its points, in a continual tension of organic doubling-back upon itself, and thus of interiorization. (pp. 301–302)

Herbert Feigl's influential 1958 article, "The 'mental' and the 'physical'," argued for a form of the identity theory (i.e. that the mind is in some sense identical to the brain) that has been interpreted as a kind of panpsychism. In fact, all identity theories tread very close to it. If mental states are identified with physical states of the brain, then we have two alternatives: (a) there is something ontologically unique about the physical structures of the human brain, such that only they instantiate mind, or (b) mentality must be associated in some sense with all physical structures. To date no one has offered a reasonable argument for (a), and thus (b) carries significant force.

Yet Feigl was noncommittal. On the one hand "the identity theory regards sentience...and other [unexperienced] qualities...as the basic reality." But he seeks to avoid "the unwarranted panpsychistic generalization." However, "one is tempted, with the panpsychists, to assume some unknown-by-acquaintance qualities quite cognate with those actually experienced" (pp. 474–475). Elsewhere he is reported to have said, "If you give me a couple of martinis, a good dinner, and a couple of after-dinner drinks, I would admit that I am strongly tempted toward (a rather watered-down, innocuous) panpsychism." (in Globus et. al. 1976: 320). This is an illuminating comment. Feigl seems to know that, intellectually, panpsychism is the superior view, but some inhibition holds him back. One wonders how many others are in such a position today.

Then in the 1970s the discussion accelerated once again. Gregory Bateson's 1970 article "Form, substance, and difference" introduced his famous but vague definition of 'information' as a "difference which makes a difference." It is also where he first connected the phenomenon of mind with feedback systems and the flow of information:

> The elementary cybernetic system with its messages in circuit is, in fact, the simplest unit of mind; ... More complicated systems are perhaps more worthy to be called mental systems, but essentially this is what we are talking about. . . . We get a picture, then, of mind as synonymous with cybernetic system... (1972: 459–460)

Cybernetic feedback systems (at least in terms of autonomous control) are ubiquitous in nature. They exist at all levels of organization, from molecular to galactic – anywhere that parts interact to form quasi-stable structures. Therefore such 'cybernetic mind' must be present throughout the universe. This in fact was Bateson's conclusion: "we know that within Mind in the widest sense there will be a hierarchy of subsystems, any one of which we can call an individual mind" (ibid.).

He elaborated:

> It means. . .that I now localize something which I am calling "Mind" immanent in the large biological system – the ecosystem. Or, if I draw the system boundaries at a different level, then mind is immanent in the total evolution structure. . . . The individual mind is immanent but not only in the body. It is immanent also in pathways and messages outside the body; and there is a larger Mind of which the individual mind is only a subsystem. This larger Mind. . .is still immanent in the total interconnected social system and planetary ecology. (460–461)

It is not just universal Mind, but mind at all levels of existence – true pluralistic panpsychism.

Gordon Globus followed with a series of articles advocating a kind of functionalist panpsychism. Two early articles (1972, 1973) were refined and elaborated upon in his "Mind, structure, and contradiction" (1976). This "defense of panpsychism" focused on a form of identity theory that identified mind with 'structure.' The brain structures itself according to its perceptions, but likewise all things are to some degree affected and reordered by their perceptions of their surroundings:

> [A] brain and a rock are systems differing enormously in "richness" of structure, and the respective "minds" accordingly differ enormously. ... Although I appreciate that most will consider it ridiculous to attribute awareness to a rock, for my purposes, I choose to emphasize the awareness intrinsic to rock ...
> (1976: 290)

Globus employed the venerable Epicurean argument: "At heart, the issue is just that there is no place to unarbitrarily draw a line (or even a range) in a hierarchy of systems increasing in complexity, above which we can say that mind occurs and below which it does not." The whole notion of mind as emerging only in high-complexity structures is "human chauvinism at its worst."

In 1979 prominent American philosopher Thomas Nagel published the essay "Panpsychism." As he said, "panpsychism appears to follow from a few simple premises, each of which is more plausible than its denial" (1979: 181): (1) physical reality consists solely of rearrangeable particles of matter; (2) mental states are neither reducible to, nor entailed by, physical states; (3) mental states are real; and (4) there are no truly emergent properties. A sound analytic argument, though traditionalists would challenge premises 2 and 4.

Like Feigl, Nagel equivocates. On the one hand the four premises are compelling. However, after some discussion he concludes: "I...believe that panpsychism should be added to the current list of mutually incompatible and hopelessly unacceptable solutions to the mind-body problem" (ibid.: 193). And yet at the end he suggests that a form of panpsychism might be viable, one in which the "[material] components out of which a point of view is constructed would not in themselves have to have points of view" (p. 194); in other words, atoms may somehow carry with them "proto-mental properties" which, though not mental, combine to create experience and points of view.

Nagel addressed the topic again in his 2002 book *Concealment and Exposure*. The relevant essay, "The psychophysical nexus," discusses the thorny issue of how far down, below the level of the brain, one might be able to postulate any mind-matter relationship. He notes that the brain must consist of numerous conscious subsystems that somehow combine to form the complex, unified whole, and that, because of this fact, we are logically compelled to consider pushing mind-matter duality down to the lowest levels of matter:

> [T]he active brain is the scene of a system of subpersonal processes that combine to constitute both its total behavioral and its phenomenological character.... This differs from traditional functionalism...in that the 'realization' here envisioned is not to be merely physiological but in some sense mental all the way down... (p. 230)

But Nagel declines to elaborate:

> I leave aside the question of how far down these states might go. Perhaps they are emergent, relative to the properties of atoms or molecules. If so, this view would imply that what emerges are states that are in themselves necessarily both physical and mental. . . .If, on the other hand, they are not emergent, this view would imply that the fundamental constituents of the world, out of which everything is composed, are neither physical nor mental but something more basic. (p. 231)

It is unclear whether such a view is panpsychist. Nagel suggests that all matter may have "mental potentialities," which are "completely inert in all but very special circumstances" (p. 234). Whether the concept of 'universal inert mental potentiality' qualifies as a form of panpsychism is open to debate.

David Bohm's *Wholeness and the Implicate Order* (1980) argues that quantum theory fundamentally undermines the assumptions of mechanism. He puts forth a neutral monist theory in which "both inanimate matter and life [are comprehended] on the basis of a single ground, common to both" (1980: 193). As the common ground, the 'implicate order' unites life and non-life in a way that implies the attribution of mind to both.

In 1982 Bohm remarked that the implicate order was *self-aware*; thus, "in a way, nature is alive, as Whitehead would say, all the way to the depths. And intelligent." (1982: 39). A speech in early 1985 contained clear and unambiguous statements. Following (but not acknowledging) Bateson, Bohm noted that mind is to be associated with "information content." On this view, "the notion of information [is] something that need not belong only to human consciousness, but that may indeed be present, in some sense, even in inanimate systems of atoms and electrons." (1986: 124–125). His conclusion was a form of pluralistic panpsychism:

> I would suggest that both [mind and body] are essentially the same. . . . It is implied that, in some sense, a rudimentary consciousness is present even at the level of particle physics. It would also be reasonable to suppose an indefinitely greater kind of consciousness that is universal and that pervades the entire process [of the universe]. (ibid.: 131)

In the mid-1990s another quantum-theory based approach emerged from the work of Stuart Hameroff and Roger Penrose (Hameroff 1994; Penrose 1994; Hameroff & Penrose 1996). They developed a model of the human mind based on the coordinated collapse of superposed quantum states within neurons. Such repeated and self-organized collapses are seen as 'moments of experience,' as in the Whiteheadian model. Hameroff then explored the philosophical implications of such an "orchestrated reduction" theory (see his 1998a, 1998b, 2006), linking quantum self-collapse, wherever it may occur, to a proto-conscious event. He suggested that "perhaps panpsychists are in some way correct and components of mental processes are fundamental, like mass, spin or charge" (1998a: 121). Furthermore, "consciousness may involve a self-organizing quantum state reduction process occurring at the Planck scale [10^{-33} cm].

In a panexperiential Platonic view consistent with modern physics, quantum spin networks encode proto-conscious 'funda-mental' experience..." (1998b).

Two books of note appeared in 1996. First was Chalmer's *The Conscious Mind*. He laid out a naturalistic dualism theory of mind in which he suggested (with an apparent diffidence) that mind can be associated with ubiquitous information states – following Bateson and Bohm, though without citing their relevant views. Second, Abram's *Spell of the Sensuous* argued from a phenomenological basis for a return to an animistic worldview as a remedy for the radical separation of humanity from nature, a separation resulting from Cartesian and mechanistic philosophies. More poetic essay than detailed philosophical inquiry, Abram's objective was simply to provoke "new thinking" among intellectuals, and to suggest a new conceptual approach "to alleviate our current estrangement from the animate earth" (p. x).

A milestone work in process panpsychism came in 1998, with David Ray Griffin's *Unsnarling the World-Knot*. Griffin gives a full and detailed exposition of the process view of panpsychism, referring to his own view as *panexperientialism*. Along the way he provides a detailed critique of both materialism and dualism, observing that panpsychist approaches have the potential to resolve a number of otherwise intractable problems. This book culminates a series of writings by Griffin advocating his panexperientialism (see e.g. his 1977, 1988, 1997).

Moving into the 21st century we find continued progress and development of panpsychist themes. DeQuincey (2002) gives a concise reading of panpsychism in history, further exploring the process view. Clarke (2003) does likewise, examining additional moral and theological implications. Mathews' *For Love of Matter* (2005) argues for a wider conception of the self, encompassing most all structures in the universe; she shows that this is not only the most rational course of action, but that it will also lead to a more sympathetic and compassionate worldview.

Most recently, Galen Strawson gave a series of talks arguing against the brute emergence of mind, and in favor of a panpsychist form of physicalism. The outcome was a landmark article, "Realistic monism." Originally published in the *Journal of Consciousness Studies* (2006), this piece is reprinted in its entirety in the present work, along with some further thoughts on Strawson's specific theory of mind.

Panpsychism thus enters the new millennium with vigor and renewed promise. It is no longer held hostage to claims that it is "breathtakingly implausible," or that "there is not the slightest reason" to adopt it (Searle 1997:48, 50). Having established its lengthy and honorable pedigree, philosophers of mind are now free to reexamine questions of mind and reality in a panpsychist light. And have no doubt: the philosophical impact of such an action will be far-reaching. *There is hardly an area of modern philosophy that would remain untouched by taking panpsychism seriously*. Mind, ontology, ethics, epistemology, perhaps even theology – all would be open to striking and radical revision. And given the deep ruts that modern philosophy finds itself in, such a development may be exactly what we need.

The ancients understood the value of such a worldview. They trusted their intuitions that the cosmos was animate throughout. They even suggested that it was the very key to future revelations about the natural world. Let me close with the poetic and visionary fragment 110 from Empedocles:

> If thou shouldst plant these things in thy firm understanding and contemplate them with good will and unclouded attention, they will stand by thee for ever every one, and thou shalt gain many other things from them; . . . for know that all things have wisdom and a portion of thought.[7]

7. Guthrie (1962–1981), vol. 2, p. 230.

PART I

Analysis and science

CHAPTER 2

Realistic monism

Why physicalism entails panpsychism

Galen Strawson

1. Physicalism

I take physicalism to be the view that every real, concrete phenomenon in the universe is. . .physical. It is a view about the actual universe, and I am going to assume that it is true. For the purposes of this paper I will equate 'concrete' with 'spatio-temporally (or at least temporally) located,' and I will use 'phenomenon' as a completely general word for any sort of existent. Plainly all mental goings on are concrete phenomena.[1]

What does physicalism involve? What is it, really, to be a physicalist? What is it to be a *realistic* physicalist, or, more simply, a *real* physicalist? Well, one thing is 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. Many words are used to denote this necessarily occurrent (essentially non-dispositional) phenomenon, and in this paper I will use the terms 'experience,' 'experiential phenomena,' and 'experientiality' to refer to it.

Full recognition of the reality of experience, then, is the obligatory starting point for any remotely realistic version of physicalism. This is because it is the obligatory starting point for any remotely realistic (indeed any non-self-defeating) theory of what there is. 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; it is a very old point that there is nothing more certain than the existence of experience.

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1. More strictly, 'concrete' means 'not abstract' in the standard philosophical sense of 'abstract,' given which some philosophers hold that abstract objects – e.g. number or concepts – exist and are real objects in every sense in which concrete objects are. I take 'spatio-temporal' to be the adjective formed from 'spacetime,' not from the conjunction of space and time.

It follows that real physicalism can have nothing to do with *physicSalism*, the view – the faith – that the nature or essence of all concrete reality can in principle be fully captured in the terms of *physics*. Real physicalism cannot have anything to do with physicSalism unless it is supposed – obviously falsely – that the terms of physics can fully capture the nature or essence of experience.[2] It is unfortunate that 'physicalism' is today standardly used to mean physicSalism because it obliges me to speak of 'real physicalism' when really I only mean 'physicalism' – realistic physicalism.

Real physicalism must accept that experiential phenomena are physical phenomena. But how can experiential phenomena be physical phenomena? Many take this claim to be profoundly problematic (it is the 'mind-body problem'). This is usually because they think they know a lot about the nature of the physical. They take the idea that the experiential is physical to be profoundly problematic *given what we know about the nature of the physical.* But they have already made a large and fatal mistake. This is because we have no good reason to think that we know anything about the physical that gives us any reason to find any problem in the idea that experiential phenomena are physical phenomena. If we reflect for a moment on the nature of our knowledge of the physical, and of the experiential, we realize, with Eddington, that "no problem of irreconcilability arises."[3]

A very large mistake. It is perhaps Descartes's, or perhaps rather 'Descartes's,' greatest mistake,[4] and it is funny that in the past fifty years it has been the most fervent revilers of the great Descartes, the true father of modern materialism, who have made the mistake with most intensity. Some of them – Dennett is a prime example – are so in thrall to the fundamental intuition of dualism, the intuition that the experiential and the physical are utterly and irreconcilably different, that they are prepared to deny the existence of experience, more or less (c)overtly, because they are committed to physicalism (i.e. physicSalism).[5]

2. For a standard argument that this is impossible in principle, see e.g. Strawson (1994: 62–65).

3. Eddington (1928: 260); the thought was not new. In the background stood Arnauld (1641), Locke (1689), Hume (1739), Priestley (1777), and many others – see Strawson (2003a: §12). Kant makes the point very clearly, on his own special terms. See e.g. Kant (1781/7), A358-60, A380 and B427-8, where he remarks that the "heterogeneity" of mind and body is merely "assumed" and not known.

4. I think that, in his hidden philosophical heart, he did not make it (he is certainly not a 'substance dualist' as this expression is currently understood; see Clarke 2003). Arnauld saw the problem clearly, and Hume (1739: 159 (1.3.14.8)) diagnosed the mistake definitively in two lines, with specific reference to the Cartesians, but the second half of the twentieth century – philosophical division – wasn't listening.

5. Dennett conceals this move by *looking-glassing* the word 'consciousness' (his term for experience) and then insisting that he does believe that consciousness exists (to looking-glass a term is to use a term in such a way that whatever one means by it, it excludes what the term means – see Strawson 2005). As far as I can understand them, Dretske, Tye, Lycan and Rey are

'They are prepared to deny the existence of experience.' At this we should stop and wonder. I think we should feel very sober, and a little afraid, at the power of human credulity, the capacity of human minds to be gripped by theory, by faith. For this particular denial is the strangest thing that has ever happened in the whole history of human thought, not just the whole history of philosophy. It falls, unfortunately, to philosophy, not religion, to reveal the deepest woo-woo of the human mind. I find this grievous, but, next to this denial, every known religious belief is only a little less sensible than the belief that grass is green.[6]

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among those who do the same. It seems that they still dream of giving a reductive analysis of the experiential in non-experiential terms. This, however, amounts to denying the existence of experience, because the nature of (real) experience can no more be specified in wholly non-experiential terms than the nature of the (real) non-experiential can be specified in wholly experiential terms. In the normal case, of course, reductive identification of X with Y is not denial of the existence of X. The reductive claim is 'X exists, but it is really just this (Y).' In the case of experience, however, to say it exists but is really just something whose nature can be fully specified in wholly non-experiential, functional terms is to deny its existence. 'But what is this supposed thing you say we're denying?' say the deniers. It's the thing to which the right reply to the question 'What is it?' is, as ever, the (Louis) Armstrong-Block reply "If you gotta ask, you ain't never gonna get to know" (Block 1978). It's the thing whose deniers say that there is no non-question-begging account of it, to which the experiential realist's correct reply is: 'It's question-begging for you to say that there must be an account of it that's non-question-begging in your terms.' Such an exchange shows that we have reached the end of argument, a point further illustrated by the fact that reductive idealists may make exactly the same 'You have no non-question-begging account' objection to reductive physicalists that reductive physicalists make to realists about experience: 'By taking it for granted that the physical is something that can (only) be specified in non-mental terms, you (reductive physicalists) simply beg the question against reductive idealists.' It's striking that the realist notion of the physical that present-day physicalists appeal to was thought to be either without warrant or unintelligible by many of the leading philosophers of the twentieth century. Many were in effect reductive idealists about the physical, and Quine famously compared belief in physical objects to belief in gods of Homer (Quine 1951: 44).

6. Dennett has suggested that "there is no such thing [as]...phenomenology" and that any appearance of phenomenology is, somehow, wholly the product of some cognitive faculty, the "judgment module" or "semantic intent module" that does not itself involve any phenomenology. "*There seems to be phenomenology*," he concedes, "but it does *not* follow from this undeniable, universally attested fact that *there really is* phenomenology" (1991: 365–366). It is unclear what Dennett means by 'phenomenology,' but whatever he means this move fails immediately if it is taken as an objection to the present claim that we can be certain both that there is experience and that we can't be radically in error about its nature. It fails for the simple reason that for there to seem to be rich phenomenology or experience just is for there to be such phenomenology or experience. To say that its apparently sensory aspects (say) are in some sense illusory because they are not the product of sensory mechanisms in the way we suppose, but are somehow generated by merely cognitive processes, is just to put forward a surprising hypothesis about part of the *mechanism* of this rich seeming that we call experience or consciousness. It is

Realistic physicalists, then, grant that experiential phenomena are real concrete phenomena – for nothing in life is more certain – and that experiential phenomena are therefore physical phenomena. It can sound odd at first to use 'physical' to characterize mental phenomena like experiential phenomena,[7] and many philosophers who call themselves materialists or physicalists continue to use the terms of ordinary everyday language, that treat the mental and the physical as opposed categories. It is, however, precisely physicalists (real physicalists) who cannot talk this way, for it is, on their own view, exactly like talking about cows and animals as if they were opposed categories. Why? Because every concrete phenomenon is physical, according to them. So all mental (experiential) phenomena are physical phenomena, according to them; just as all cows are animals. So when physicalists – real ones – talk as if the mental (experiential) and the physical were entirely different all they can really mean to be doing is to distinguish, within the realm of the physical, which is the only realm there is, according to them, between mental (experiential) features of the physical, and non-mental (non-experiential) features of the physical.

As a real physicalist, then, I hold that the mental/experiential is physical, and I am 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 I say these words I mean something completely different from what many physicalists have apparently meant by them. I certainly don't 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. That idea is crazy. It amounts to radical 'eliminativism' with respect to experience, and it is not a form of real physicalism at all.[8] My claim is different. It is that experiential phenomena 'just are' physical, so that there is a lot more to neurons than physics and neurophysiology record (or can record). No one who disagrees with this is a real physicalist, in my terms.

In a paper called "Real materialism" I considered some objections to the claim that the position I have just outlined can really be called a physicalist position. I did my best

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in no way to put in question its existence or reality. Whatever the process by which the seeming arises, the end result of the process is, as even Dennett agrees, at least this: that it *seems* as if one is having phenomenally rich experience of Beethoven's eighth quartet or an Indian wedding; and if there is this seeming, then, once again, there just is phenomenology or experience (adapted from Strawson 1994: 51–52). In denying that experience can be physical, Dennett and his kind find themselves at one with many religious believers. This seems at first ironic, but the two camps are deeply united by the fact that both have unshakable faith in something that lacks any warrant in experience. That said, the religious believers are in infinitely better shape, epistemologically, than the Dennettians.

7. For the purposes of this paper I make the standard assumption that while all experiential phenomena are mental phenomena, the converse is not true.

8. This follows from the fact that current physics contains no predicates for experiential phenomena, and that no non-revolutionary extension of it (no currently conceivable extension of it – see Footnote 2) could do so.

to answer them and ended concessively, allowing that one might better call the position 'experiential-and-non-experiential monism' rather than 'real physicalism.' It is, in any case, the position of someone who (a) fully acknowledges the evident fact that there is experiential being in reality, (b) takes it that there is also non-experiential being in reality, and (c) is attached to the 'monist' idea that there is, in some fundamental sense, only one kind of stuff in the universe.

The objectors then picked on the word 'monist,' and I considered a further concession. You can call my position 'experiential-and-non-experiential ?-ism,' if you like, and opt out of the monism-dualism-pluralism oppositions of classical metaphysics. Perhaps you can simply call it '?-ism.'[9] But then you will have to allow that the existence of experiential being at least is certain, and is not put in question by the '?' – so that it would be better to call it 'experiential ?-ism.' And if you then want to insist, in line with all standard conceptions of the physical, that non-experiential being also exists, then you will also need to signal the fact that the non-experiential is not put in question by the '?'. In which case you may as well go back to calling the position 'experiential-and-non-experiential ?-ism.'

I persist in thinking that 'physicalism,' 'real physicalism,' is a good name for my position in the current context of debate, but it's time to admit that in my understanding real physicalism doesn't even rule out panpsychism – which I take to be the view that the existence of every real concrete thing involves experiential being even if it also involves non-experiential being. If this seems a little colourful then it's time to read Locke on substance again.[10]

Surely I've pushed myself over the edge? How can I say that 'physicalism' is an acceptable name for my position? Because I take 'physical' to be a natural-kind term whose reference I can sufficiently indicate by drawing attention to tables and chairs and – as a realistic physicalist – experiential phenomena.[11] The physical is whatever general kind of thing we are considering when we consider things like tables and chairs and experiential phenomena. It includes everything that concretely exists in the universe. If everything that concretely exists is intrinsically experience-involving, well, that is what the physical turns out to be; it is what energy (another name for physical stuff) turns out to be. This view does not stand out as particularly strange against the background of present-day science, and is in no way incompatible with it.

I don't *define* the physical as concrete reality, as concrete-reality-whatever-it-is; obviously I can't rule out the possibility that there could be other non-physical (and indeed non-spatiotemporal) forms of concrete reality. I simply fix the reference of the term 'physical' by pointing at certain items and invoking the notion of a general kind

9. A suggestion made by Sebastian Gardner, nearly twenty years ago.

10. Locke (1689), 2.23 and 4.3.6.

11. It's striking that analytic philosophers and psychologists have talked so much about natural-kind terms but have failed to see that 'physical' is a paradigmatic example of such a term in every sense in which 'gold' is.

of stuff. It is true that there is a sense in which this makes my use of the term vacuous, for, relative to our universe, 'physical stuff' is now equivalent to 'real and concrete stuff,' and cannot be anything to do with the term 'physical' that is used to mark out a position in what is usually taken to be a substantive debate about the ultimate nature of concrete reality (physicalism vs immaterialism vs dualism vs pluralism vs...). But that is fine by me. If it's back to Carnap, so be it.[12]

Have I gone too far? It seems to me that to go this far is exactly the right thing to do at this point in the debate. It's worth it if it helps us to get back to a proper (realistic) openmindedness. But anyone who prefers to call my position 'realistic monism' instead of 'real physicalism' should feel free to do so.[13]

2. 'It seems rather silly ...'

This may all seem a little giddy, so I will now rein things in a little by making three conventional substantive assumptions about the physical for purposes of argument, using the term 'ultimate' to denote a fundamental physical entity, an ultimate constituent of reality, a particle, field, string, brane, simple, whatever:

(1) there is a plurality of ultimates (whether or not there is a plurality of types of ultimates)[14]

(2) everything physical (everything physical that there is or could be) is constituted out of ultimates of the sort we actually have in our universe

(3) the universe is spatio-temporal in its fundamental nature.[15]

I do not, however, think that I need these assumptions in order to show that something akin to panpsychism is not merely one possible form of realistic physicalism, real phys-

12. See Carnap 1950.

13. It is less certain that there is non-experiential stuff than that there is experiential stuff, and in most ears 'real physicalism' signals commitment to the existence of non-experiential stuff in a way that 'realistic monism' does not.

14. I believe that cosmology raises serious doubts about (Leibnizian) (1); a powerful rival (Spinozistic) view is that there is at bottom just one thing or substance, e.g. spacetime, or whatever underlies all spacetime appearances. But (1) does not beg any important questions. If anything, it makes things more difficult for me.

15. This is in doubt in present-day physics and cosmology, for "rumors of spacetime's impending departure from deep physical law are not born of zany theorizing. Instead, this idea is strongly suggested by a number of well-reasoned considerations" (Greene 2004: 472; see also 473–491). Note that if temporality goes, i.e. not just spacetime™ as we currently understand it but temporality in any form, then experience also goes, given that experience requires time. One of the fine consequences of this is that there has never been any suffering. But no theory of reality can be right that has the consequence that there has never been any suffering.

icalism, but the only possible form, and, hence, the only possible form of physicalism *tout court*. Eddington is one of those who saw this clearly, and I am now going to join forces with him and ask you to be as tolerant of his terminological loosenesses and oddities as I hope you will be of my appeals to intuition.[16]

One thing we know about physical stuff, given that (real) physicalism is true, is that when you put it together in the way in which it is put together in brains like ours, it regularly constitutes – is, literally is – experience like ours. Another thing we know about it, let us grant, is everything (true) that physics tells us. But what is this second kind of knowledge like? Well, there is a fundamental sense in which it is "abstract," "purely formal," merely a matter of "structure," in Russell's words.[17] This is a well established but often overlooked point.[18] "Physics is mathematical," Russell says, "not because we know so much about the physical world" – and here he means the non-mental, non-experiential world, in my terms, because he is using 'mental' and 'physical' conventionally as opposed terms –

> but because we know so little: it is only its mathematical properties that we can discover. For the rest, our knowledge is negative.... The physical world is only known as regards certain abstract features of its space-time structure – features which, because of their abstractness, do not suffice to show whether the physical world is, or is not, different in intrinsic character from the world of mind.[19]

Eddington puts it as follows. "Our knowledge of the nature of the objects treated in physics consists solely of readings of pointers (on instrument dials) and other indicators." This being so, he asks, "what knowledge have we of the nature of atoms that renders it at all incongruous that they should constitute a thinking object?" Absolutely none, he rightly replies: "science has nothing to say as to the intrinsic nature of the atom." The atom, so far as physics tells us anything about it,

> is, like everything else in physics, a schedule of pointer readings (on instrument dials). The schedule is, we agree, attached to some unknown background. Why not then attach it to something of a spiritual (i.e. mental) nature of which a prominent characteristic is *thought* (=experience, consciousness). It seems rather **silly** to prefer to attach it to something of a so-called 'concrete' nature inconsistent with thought, and then to wonder where the thought comes from. We have dismissed

16. I came upon Eddington's book *The Nature of the Physical World* in a holiday house in Scotland in 1999.

17. Russell (1927a: 392, 382); (1956: 153); (1927b: 125).

18. It takes time to assimilate it fully. It cannot be simply read off the page.

19. Russell (1948: 240); see also p. 247. Russell's overall view is that "we know nothing about the intrinsic quality of physical events except when these are mental events that we directly experience" (Russell 1956: 153), and that "as regards the world in general, both physical and mental, everything that we know of its intrinsic character is derived from the mental side" (1927a: 402). See Lockwood (1981; 1989), Strawson (2003a).

> all preconception as to the background of our pointer readings, and for the most part can discover nothing as to its nature. But in one case – namely, for the pointer readings of my own brain – I have an insight which is not limited to the evidence of the pointer readings. That insight shows that they are attached to a background of consciousness

in which case

> I may expect that the background of other pointer readings in physics is *of a nature continuous with that revealed to me in this way*,

even while

> I do not suppose that it always has the more specialized attributes of consciousness.

What is certain is that

> in regard to my one piece of insight into the background no problem of irreconcilability arises; I have no other knowledge of the background with which to reconcile it...*There is nothing to prevent the assemblage of atoms constituting a brain from being of itself a thinking* [*conscious, experiencing*] *object in virtue of that nature which physics leaves undetermined and undeterminable.* If we must embed our schedule of indicator readings in some kind of background, at least let us accept the only hint we have received as to the significance of the background – namely, that it has a nature capable of manifesting itself as mental activity.[20]

This all seems intensely sensible and Occamical. Eddington's notion of silliness is extremely powerful. Why then – on what conceivable grounds – do so many physicalists simply assume that the physical, in itself, is an essentially and wholly non-experiential phenomenon?

I write this and think 'Do they really?,' and this rapid inner question is not rhetorical or aggressive, meaning 'They must be pretty stupid if they really think, and think they know, that physical stuff is, in itself, and through and through, an essentially non-experiential phenomenon.' It is, rather, part of a feeling that I must be wrong. I must be doing what philosophers are famous for doing – setting up straw-man opponents who do not really exist while erasing awareness of my real audience, who will protest

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20. Eddington (1928: 258–260); my emphasis on 'silly.' It is remarkable that this line of thought (so well understood by Russell, Whitehead, Eddington, Broad, Feigl and many others, and equally, in a number of slightly different guises, by Spinoza, Locke, Hume, Kant, Priestley and many others) disappeared almost completely from the philosophical mainstream in the wake of Smart's 1959 paper "Sensations and brain processes;" although it was well represented by Chomsky (see e.g. Chomsky 1968, 1995). At this point analytical philosophy acquired hyperdualist intuitions even as it proclaimed its monism. With a few honourable exceptions it out-Descartesed Descartes (or 'Descartes') in its certainty that we know enough about the physical to know that the experiential cannot be physical.

that of course they aren't so foolish as to claim to know that physical stuff is, in itself, in its root nature, a wholly non-experiential phenomenon.

My next thought, however, is that I am not wrong. It looks as if many – perhaps most – of those who call themselves physicalists or materialists really are committed to the thesis that

> [NE] physical stuff is, in itself, in its fundamental nature, something wholly and utterly non-experiential.

I think they take it, for a start, that ultimates are in themselves wholly and essentially non-experiential phenomena. And they are hardly going out on a limb in endorsing NE, for it seems to be accepted by the vast majority of human beings. I do not, however, see how physicalists can leave this commitment unquestioned, if they are remotely realistic in their physicalism, i.e. if they really do subscribe to the defining thesis of real physicalism that

> [RP] experience is a real concrete phenomenon and every real concrete phenomenon is physical.

For if they are real physicalists they cannot deny that when you put physical stuff together in the way in which it is put together in brains like ours, it constitutes – is – experience like ours; all by itself. All by itself: there is on their own physicalist view nothing else, nothing non-physical, involved.

The puzzle, for me, is that I'm sure that some at least of those who call themselves physicalists are realistic physicalists – real realists about experiential phenomena. Yet they do, I think, subscribe to NE – even when they are prepared to admit, with Eddington, that physical stuff has, in itself, "a nature capable of manifesting itself as mental activity," i.e. as experience or consciousness.

3. Emergence

Is this a possible position? Can one hold RP and NE together? I don't think so, but one defence goes like this:

> Experiential phenomena are *emergent* phenomena. Consciousness properties, experience properties, are emergent properties of wholly and utterly non-conscious, non-experiential phenomena. Physical stuff *in itself*, in its basic nature, is indeed a wholly non-conscious, non-experiential phenomenon. Nevertheless when parts of it combine in certain ways, experiential phenomena 'emerge.' Ultimates in themselves are wholly non-conscious, non-experiential phenomena. Nevertheless, when they combine in certain ways, experiential phenomena 'emerge.'

Does this conception of emergence make sense? I think that it is very, very hard to understand what it is supposed to involve. I think that it is incoherent, in fact, and that this general way of talking of emergence has acquired an air of plausibility (or at least possibility) for some simply because it has been appealed to many times in the face of a seeming mystery.[21] In order to discuss it I am going to take it that any position that combines RP with NE must invoke some notion of emergence, whether or not it chooses to use the word. I will start on familiar ground.

Liquidity is often proposed as a translucent example of an emergent phenomenon, and the facts seem straightforward. Liquidity is not a characteristic of individual H_2O molecules. Nor is it a characteristic of the ultimates of which H_2O molecules are composed. Yet when you put many H_2O molecules together they constitute a liquid (at certain temperatures, at least), they constitute something liquid. So liquidity is a truly emergent property of certain groups of H_2O molecules. It is not there at the bottom of things, and then it is there.

When heat is applied evenly to the bottom of a tray filled with a thin sheet of viscous oil, it transforms the smooth surface of the oil into an array of hexagonal cells of moving fluid called Bénard convection cells (see Velarde & Normand 1980). This is another popular example of an emergent phenomenon. There are many chemical and physical systems in which patterns of this sort arise simply from the routine workings of basic physical laws, and such patterns are called 'emergent.'

This is all delightful and true. But can we hope to understand the alleged emergence of experiential phenomena from non-experiential phenomena by reference to such models? I don't think so. The emergent character of liquidity relative to its non-liquid constituents does indeed seem shiningly easy to grasp. We can easily make intuitive sense of the idea that certain sorts of molecules are so constituted that they don't bind together in a tight lattice but slide past or off each other (in accordance with van de Waals molecular interaction laws) in a way that gives rise to – is – the phenomenon of liquidity. So too, with Bénard convection cells we can easily make sense of the idea that physical laws relating to surface tension, viscosity, and other forces governing the motion of molecules give rise to hexagonal patterns on the surface of a fluid like oil when it is heated. In both these cases we move in a small set of conceptually homogeneous shape-size-mass-charge-number-position-motion-involving physics notions with no sense of puzzlement. Using the notion of reduction in the familiar loose way, we can say that the phenomena of liquidity reduce without remainder to shape-size-mass-charge-etc. phenomena – I'll call them 'P' phenomena for short, and assume for now that they are, in themselves, utterly non-experiential phenomena. We can see that the phenomenon of liquidity arises naturally out of, is *wholly dependent on*, phenomena that do not in themselves involve liquidity at all. We can with only a little work suppress our initial tendency to confuse liquidity as it appears to sensory experience (how, we may think, could *this* arise from individual non-liquid molecules?) with the physical phenomenon of liquidity considered just as such, and see clearly that it is just and wholly a matter of P phenomena.

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21. Compare the way in which the word 'immaterial' comes to seem to have some positive descriptive meaning although it quite explicitly has none. For a recent helpful taxonomy of types of emergence, see van Gulick (2001); see also Broad (1925) and McLaughlin (1992).

This notion of total dependence looks useful. It seems plain that there must be a fundamental sense in which any emergent phenomenon, say Y, is wholly dependent on that which it emerges from, say X. It seems, in fact, that this must be true by definition of 'emergent'; for if there is not this total dependence then it will not be true after all, not true without qualification, to say that Y is emergent from X. For in this case at least some part or aspect of Y will have to hail from somewhere else and will therefore not be emergent from X. Plainly this is not how it is with liquidity.[22]

It is the dependence requirement that causes the problem when it comes to relating the supposedly emergent phenomena of experience to the supposedly wholly non-experiential phenomena from which they supposedly emerge. For it now seems that if experiential phenomena – colour-experiences, for example – really are somehow (wholly) dependent on non-experiential phenomena, as they must be if they are to be truly emergent from them, that is, emergent from them and from them alone, then there must (to quote myself in a former century) be

> a correct way of describing things…given which one can relate [the experiential phenomenon of] color-experience, considered just as such, to the non-experiential phenomena on which it is supposed to depend, in such a way that the dependence is as intelligible as the dependence of the liquidity of water on the interaction properties of individual molecules. The alternative, after all, is that there should be total dependence that is not intelligible or explicable in any possible physics, dependence that must be unintelligible and inexplicable even to God, as it were. (Strawson 1994: 69)

I wouldn't put it this way now. The notions of explicability and intelligibility are in origin epistemological, and are potentially misleading, because the present claim is not epistemological. It is not, for example, touched by the reply that there is a sense in which all *causal* dependence relations, at least, are ultimately unintelligible to us, even those that seem most intuitively understandable. For although there is a sense in which this is true, in as much all our explanations of concrete phenomena come

22. Here, then, I reject the commonly embraced but little examined and seemingly wholly mystical notion of emergence that van Gulick (2001) calls "Radical Kind Emergence" and defines as follows: "the whole has features that are both (a) different in kind from those had by the parts, and (b) of a kind whose nature is not necessitated by the features of its parts, their mode of combination and the law-like regularities governing the features of its parts." (Liquidity, in van Gulick's scheme, is by contrast a case of 'Modest Kind Emergence': it is simply that "the whole has features that are different in kind from those of its parts (or alternatively that could be had by its parts). For example, a piece of cloth might be purple in hue even though none of the molecules that make up its surface could be said to be purple.") Some hold out for mystico-magical emergence by saying that liquidity is only a resultant phenomenon, not truly emergent, a truly emergent phenomenon being precisely one that does not perspicuously 'reduce' to what it emerges from in the way that the liquid phenomena reduce to non-liquid phenomena. Mystery, however, should be used sparingly. It should not be used to try to solve a problem of reconcilability that turns out on close examination not to exist.

to an end in things that are simply given, contingent, not further explicable, it has no bearing here. 'Intelligible to God' isn't really an epistemological notion at all, it's just a way of expressing the idea that there must be something about the nature of the emerged-from (and nothing else) in virtue of which the emerger emerges as it does and is what it is.

You can get liquidity from non-liquid molecules as easily as you can get a cricket team from eleven things that are not cricket teams. In God's physics, it would have to be just as plain how you get experiential phenomena from wholly non-experiential phenomena. But this is what boggles the human mind. We have, once again, no difficulty with the idea that liquid phenomena (which are wholly P phenomena) are emergent properties of wholly non-liquid phenomena (which are wholly P phenomena). But when we return to the case of experience, and look for an analogy of the right size or momentousness, as it were, it seems that we can't make do with things like liquidity, where we move wholly within a completely conceptually homogeneous (non-heterogeneous) set of notions. We need an analogy on a wholly different scale if we are to get any imaginative grip on the supposed move from the non-experiential to the experiential.

What might be an analogy of the right size? Suppose someone – I will call him pseudo-Boscovich, at the risk of offending historians of science – proposes that all ultimates, all real, concrete ultimates, are, in truth, wholly unextended entities: that this is the truth about their being; that there is *no* sense in which they themselves are extended; that they are real concrete entities, but are none the less true-mathematical-point entities. And suppose pseudo-Boscovich goes on to say that when collections of these entities stand in certain (real, concrete, natural) relations, they give rise to or constitute truly, genuinely extended concrete entities; real, concrete extension being in this sense an *emergent property* of phenomena that are, although by hypothesis real and concrete, wholly unextended.

Well, I think this suggestion should be rejected as absurd. But the suggestion that when non-experiential phenomena stand in certain (real, natural, concrete non-experiential) relations they *ipso facto* instantiate or constitute experiential phenomena, experience being an emergent property of wholly and utterly non-experiential phenomena, seems exactly on a par. That's why I offer unextended-to-extended emergence as an analogy, a destructive analogy that proposes something impossible and thereby challenges the possibility of the thing it is offered as an analogy for. You can (to use the letter favoured by the German idealists when stating or rejecting the law of non-contradiction) get A from non-A for some substitutions for A, such as liquidity, but not all.

> – My poor friend. The idea that collections of concrete entities that are truly, genuinely unextended can give rise to or constitute concrete entities that are truly, genuinely extended is actually scientific orthodoxy, on one widely received view of what ultimates are. It's an excellent candidate for being an analogy of the right size.

But this won't do. It won't do when one is being metaphysically straight, not *metaphysically* instrumentalist, or positivist, or operationalist, or phenomenalist, or radical-empiricist, or verificationist, or neo-verificationist or otherwise anti-realist or Protagorean (alas for the twentieth century, in which all these epistemological notions somehow got metaphysicalized). If one is being metaphysically straight, the intuition that nothing (concrete, spatio-temporal) can exist at a mathematical point, because there just isn't any room, is rock solid.[23] It may be added that anything that has, or is well understood as, a field, or that has any sort of attractive or repulsive being or energy, or any area of influence or influencability, *ipso facto* has extension – extension is part of its being – and that although there are plenty of ultimates that have no charge in what physicists call 'the standard model,' there are I believe none that are not associated with a field.[24] So if the idea of unextended-to-extended emergence is offered as an analogy for non-experiential-to-experiential emergence, it can't help.

I'll take this a little further. Suppose someone proposes that there are real, concrete, intrinsically, irreducibly and wholly *non-spatial* phenomena ('wholly non-S phenomena'), and that when they stand in certain wholly non-spatial relations they give rise to or constitute real, concrete, intrinsically and irreducibly spatial phenomena, ('S phenomena'), these being emergent features of wholly non-S phenomena. Those who claim to find no difficulty in the idea that genuinely unextended concrete entities can give rise to or constitute genuinely extended concrete entities may like to consider this case separately, because they presumably take it that their putative mathematical-point entities are at least spatial entities, at least in the sense of being spatially located. My hope is that even if they think they can make sense of the emergence of the extended from the unextended, they won't think this about the more radical case of the emergence of the spatial from the non-spatial.

But what do I know about this? Almost nothing. With this kind of speculation "we are got into fairy land," as Hume says, or rather I am, and any impossibility claim on my part, or indeed anyone else's, may seem rash.[25] And some may now propose that the 'Big Bang' is precisely a case in which S phenomena are indeed emergent features of wholly non-S phenomena.

23. Do not be cowed by physicists or philosophers of physics. It seems intuitively obvious, by the grace of mathematics, that to introduce real, concrete entities that are infinitely small and therefore metaphysically impossible into one's theory will lead to infinite largenesses popping up in protest elsewhere in one's equations. And so it came to pass.

24. As I understand it, every particle in the standard model feels a force, even the photon (i.e. photon-photon forces, mediated by – virtual – pair creation/annihilation processes for the sources of the photon). This sort of point no longer seems required, however, in string theory (M-theory or brane-theory), given that all the ultimates of M-theory have extension.

25. Hume (1748: 72). It is quite plain, in any case, that people can think (or think they think) anything.

Don't believe it, I say, falling back on the *argumentum a visceris*. S phenomena, i.e. real, concrete, intrinsically and irreducibly spatial phenomena (bear in mind that we are seeking an analogy for experiential phenomena that we know to be real, concrete, intrinsically and irreducibly experiential) *can't* be emergent properties of wholly non-S phenomena. This is a case where you can't get A from non-A. The spatial/non-spatial case may look like an analogy of the right size for the experiential/non-experiential case, but all it turns up, I suggest, is impossibility. If there is any sense in which S phenomena can be said to emerge from wholly non-S phenomena, then they must fall back into the category of mere appearance, and they are then (by definition, see above) not S phenomena at all. Experiential phenomena, however, cannot do this. They cannot be mere appearance, if only because all appearance depends on their existence.[26] If it were to turn out that real S phenomena can after all emerge from wholly non-S phenomena, all that would follow would be that the spatial case did not after all constitute an analogy of the right size. The experiential/non-experiential divide, assuming that it exists at all, is the most fundamental divide in nature (the only way it can fail to exist is for there to be nothing non-experiential in nature).[27]

The claim, at least, is plain, and I'll repeat it. If it really is true that Y is emergent from X then it must be the case that Y is in some sense wholly dependent on X and X alone, so that all features of Y trace intelligibly back to X (where 'intelligible' is a metaphysical rather than an epistemic notion). *Emergence can't be brute*. It is built into the heart of the notion of emergence that emergence cannot be brute in the sense of there being absolutely no reason in the nature of things why the emerging thing is as it is (so that it is unintelligible even to God). For any feature Y of anything that is correctly considered to be emergent from X, there must be something about X and X alone in virtue of which Y emerges, and which is sufficient for Y.

I'm prepared to allow for argument that an ultimate's possession of its fundamental properties could be brute in the sense of there being no reason for it in the nature of things, so long as it is agreed that *emergence* cannot be brute. One problem is that brute emergence is by definition a miracle every time it occurs, for it is true by hypothesis that in brute emergence there is absolutely nothing about X, the emerged-from, in virtue of which Y, the emerger, emerges from it. And this means that it is also a contradiction in terms, given the standard assumption that the emergence of Y from X entails the 'supervenience' of Y on X,[28] because it then turns out to be a strictly lawlike

26. See Footnote 6. One current view of the 'Big Bang' is that it occurred everywhere in an already existing infinite space.

27. The viscera are not unsophisticated organs. They can refuse the getting of A from non-A for some substitutions for A even while they have no difficulty with the strangest quantum strangenesses (see e.g. Strawson 2003a: 65).

28. The supervenience thesis states that if Y is supervenient on X then whenever you have a X-type phenomenon you must also have an Y-type phenomenon.

miracle. But a miracle is by definition a violation of a law of nature![29] If someone says he chooses to use the word 'emergence' in such a way that the notion of brute emergence is not incoherent, I will know that he is a member of the Humpty Dumpty army and be very careful with him.

How did the notion of brute emergence ever gain currency? By one of the most lethal processes of theory formation, or term formation, that there is. The notion of brute emergence marks a position that seemingly has to exist if one accepts both RP (or, more simply, the reality of experience) and NE. And since many are irredeemably committed to both RP and NE, the notion of brute emergence comes to feel substantial to them by a kind of reflected, holographical energy. It has to be there, given these unquestioned premisses, so it is felt to be real. The whole process is underwritten by the wild radical-empiricism-inspired metaphysical irresponsibilities of the twentieth century that still linger on (to put it mildly) today and have led many, via a gross misunderstanding of Hume, to think that there is nothing intrinsic to a cause in virtue of which it has the effect it does.[30]

I'll say it again. For Y truly to emerge from X is for Y to arise from or out of X or be given in or with Y given how X *is.* Y must arise out of or be given in X in some essentially non-arbitrary and indeed wholly non-arbitrary way. X has to have something – indeed everything – to do with it. That's what emerging is (that's how liquidity arises out of non-liquid phenomena). It is essentially an in-virtue-of relation. It cannot be brute. Otherwise it will be intelligible to suppose that existence can emerge from (come out of, develop out of) non-existence, or even that concrete phenomena can emerge from wholly abstract phenomena. Brutality rules out nothing.[31] If emergence can be brute, then it is fully intelligible to suppose that non-physical soul-stuff can arise out of

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29. This is Hume's definition of a miracle (I'm assuming that there is no *deus ex machina*). It is often said that this definition requires an absolute, non-statistical notion of a law of nature, but this is not so (see Mackie 1982, Chapter 4).

30. Here I make the common assumption that it is legitimate to segment the world into causes and effects. Hume's wholly correct, strictly epistemological claim – that so far as we consider things *a priori* 'any thing may produce any thing' – came to be read as the metaphysical claim that anything may produce anything. For a discussion of this error see e.g. Craig (1987), Chapter 2; Strawson (2000). It is worth noting that the epistemological restriction is usually explicitly stated in Hume's *Treatise*, in spite of his youthful liking for dramatic abbreviation: "I have inferr'd from these principles, that *to consider the matter a priori*, any thing may produce any thing, and that we shall never discover a reason, why any object may or may not be the cause of any other, however great, or however little the resemblance may be betwixt them" (*Treatise*, p. 247); "*for ought we can determine by the mere ideas*, any thing may be the cause or effect of any thing" (pp. 249–250; my emphasis). Brute emergence does indeed license the non-Humean, ontological version of 'any thing may produce any thing.'

31. Even if a universe could just come into existence when nothing existed, it certainly couldn't emerge from non-existence in the relevant sense of 'emerge.' *Ex nihilo nihil fit*, whatever anyone says (Nobel Prize winners included).

physical stuff – in which case we can't rule out the possibility of Cartesian egos *even if we are physicalists*. I'm not even sure we can rule out the possibility of a negative number emerging from the addition of certain positive numbers. We will certainly have to view with equanimity all violations of existing laws of (non-experiential) physics, dross turning adventitiously into gold, particles decaying into other particles whose joint charge differs from that of the original particle.

Returning to the case of experience, Occam cuts in again, with truly devastating effect. Given the undeniable reality of experience, he says, why on earth (our current location) commit oneself to NE? Why insist that physical stuff in itself, in its basic nature, is essentially non-experiential, thereby taking on

a. a commitment to something – wholly and essentially non-experiential stuff – for which there is *absolutely no evidence whatever*

along with

b. the wholly unnecessary (and incoherent) burden of brute emergence

otherwise known as magic? That, in Eddington's terms, is silly.

> – What about the emergence of life? A hundred years ago it seemed obvious to many so-called 'vitalists' that *life* could not emerge from utterly lifeless matter (from P phenomena), just as it seems obvious to you now that *experience* could not emerge from utterly non-experiential matter (from P phenomena). Today, however, no one seriously doubts that life emerged from matter that involved no life at all. The problem of life, that seemed insuperable, simply dissolved. Why should it not be the same with consciousness, a hundred years from now?

This very tired objection is always made in discussions of this sort, and the first thing to note is that one cannot draw a parallel between the perceived problem of life and the perceived problem of experience in this way, arguing that the second problem will dissolve just as the first did, unless one considers life completely apart from experience. So let us call life considered completely apart from experience 'life*.' My reply is then brief. Life* reduces, experience doesn't. Take away experience from life and it (life*) reduces smoothly to P phenomena. Our theory of the basic mechanisms of life reduces to physics via chemistry. Suppose we have a machine that can duplicate any object by a process of rapid atom-by-atom assembly, and we duplicate a child. We can explain its life* functions in exquisite detail in the terms of current sciences of physics, chemistry and biology. We cannot explain its experience at all in these terms.

One of the odd things about the supposed problem of life* is that although it was very popular at the end of the nineteenth century it would not have been thought very impressive in the seventeenth and eighteenth centuries. The problem of *experience* seemed as acute then as it does today, but many found little difficulty in the idea that animals including human beings were – except insofar as they had experience –

simply physical machines.[32] It may be added that many were quite unmoved by the problem of life* even when it was at the height of its popularity, but found the problem of experience as acute as their seventeenth- and eighteenth-century predecessors and twentieth- and twenty-first century successors.[33]

4. 'Proto-experiential'

Some may insist again that they find nothing intolerable in the idea that S phenomena can be emergent properties of something wholly non-S, and they may add that they feel the same about the experiential emerging from the wholly non-experiential.

What should one do? Encourage them, first, to see – to allow – that if (spatial) S phenomena can be emergent properties of wholly non-S phenomena then the stuff emerged-from, the non-spatial whatever-it-is, must at the very least be somehow *intrinsically suited* to constituting spatial phenomena, on their view; it must be 'proto-spatial' in that sense.

> – Quite so. And exactly the same may be true of experiential phenomena. Experiential phenomena can indeed emerge from wholly and utterly non-experiential phenomena. This is possible because these non-experiential phenomena are intrinsically suited to constituting experiential phenomena in certain circumstances, and are 'proto-experiential' in that sense, although ultimately non-experiential in themselves.

This doesn't escape the problem, it simply changes the terms. 'Proto-experiential' now means 'intrinsically suited to constituting certain sorts of experiential phenomena in certain circumstances,' and clearly – necessarily – for X to be intrinsically suited to or for constituting Y in certain circumstances is for there to be something about X's nature *in virtue of which* X is so suited.[34] If there is no such in-virtue-of-ness, no such intrinsic suitability, then any supposed emergence is left brute, in which case it is not emergence at all, it is magic, and everything is permitted, including, presumably, the emergence of the (ontological) concrete from the (ontological) abstract. If on the other hand there is such intrinsic suitability, as there must be if there is to be emergence, how

32. Many also took it that experience, too, was just a physical phenomenon, although we could not understand how. Joseph Priestley made the point that we know nothing about the physical that gives us reason to think that the experiential is not physical with its full force in 1777; Locke had already made it, somewhat circumspectly, in the 1690s; as had Regius in 1648.

33. See e.g. James (1890), and references there.

34. It is not clear what the import of the phrase 'in certain circumstances' is, but the circumstances must presumably themselves be wholly non-spatial and non-experiential, and they cannot in any case make any contribution to the spatiality or the experientiality if it is to emerge wholly and only from the wholly non-spatial and non-experiential phenomena that are being taken to be distinct from the circumstances in which they find themselves.

can this be possessed by wholly, utterly, through-and-through non-experiential phenomena? (This is the unargued intuition again. Bear in mind that the intuition that the non-experiential could not emerge from the wholly experiential is exactly parallel and unargued.) If you take the word 'proto-experiential' to mean 'not actually experiential, but just what is needed for experience,' then the gap is unbridged.[35] If you take it to mean 'already intrinsically (occurrently) experiential, although very different, qualitatively, from the experience whose realizing ground we are supposing it be,' you have conceded the fundamental point.

> – You're waving your arms around. H_2O molecules are, precisely, 'proto-liquid,' and are at the same time, in themselves, wholly and utterly non-liquid.

To offer the liquidity analogy is to see its inadequacy. Liquidity is a P phenomenon that reduces without remainder to other P phenomena. Analysed in terms of P properties, liquid bodies of water and H_2O molecules have exactly the same sorts of properties, and they are made of exactly the same stuff (ultimates). This is not the case when it comes to experiential phenomena and non-experiential phenomena, for it is built into our starting point, set by NE, that they do not have the same sorts of properties at all in this sense. The analogy is not of the right size or kind. What we need, to put it now in terms of P properties, is, precisely, an analogy that could give us some idea of how (natural, intrinsic, non-conventional) non-P properties could emerge from P properties – and of how things with only P properties could be proto-non-P phenomena.[36]

It may be said that the analogy can still help indirectly by pointing to a version of what is sometimes called 'neutral monism.' The central idea of neutral monism is that there is a fundamental, correct way of conceiving things – let us say that it involves

35. Compare Chalmers's (1996) use of 'protophenomenal.' Chalmers is a realist about experience but he gives central place to an idea that rules out real physicalism; the idea that there could be creatures that have no experiential properties although they are 'perfect physical duplicates' of experiencing human beings. These creatures, *Australian zombies*, have done a lot of damage in recent discussion, blotting out classical philosophical zombies, who are outwardly and behaviourally indistinguishable from human beings but with unknown and possibly non-biological insides. Chalmers holds that Australian zombies are a real possibility, but this is not something that can be shown, if only because there is a great deal we do not know about the physical, and it is fabulously implausible to suppose that an atom-for-atom, state-for-state duplicate of an experiencing human being could be produced and not have experience (note that one cannot produce an atom-for-atom, state-for-state duplicate of one of us while varying the laws of nature).

36. Objections to (a) standard physicalism and (b) the rejection of radical emergence sometimes advert to the fact that conventional phenomena – phenomena essentially involving conventions – may plausibly be said to arise from wholly and utterly non-conventional phenomena. There is, however, no difficulty in the idea that all concretely existing conventional phenomena are wholly physical phenomena, and the emergence of conventional phenomena from non-conventional phenomena is easily explicable in general terms by real physicalism, which acknowledges, of course, the existence of experiential phenomena.

conceiving of them in terms of 'Z' properties – given which all concrete phenomena, experiential and non-experiential, are on a par in all being equally Z phenomena. They are on a par in just the same way as the way in which, according to NE physicalism, all concrete phenomena are on a par in being P phenomena. The claim is then that if one duly conceives all concrete phenomena as Z phenomena, thereby acknowledging their fundamental uniformity, (i) the emergence of experiential phenomena from non-experiential phenomena is as unsurprising as (ii) the emergence of liquid phenomena from non-liquid phenomena is when one conceives things in terms of P phenomena. For both non-experiential P phenomena and experiential phenomena are *Z* phenomena, so really all we find is the emergence of *Z* phenomena from *Z* phenomena.

This proposal, however, merely confirms the current position. For what we do, when we give a satisfactory account of how liquidity emerges from non-liquidity, is show that there aren't really any new properties involved at all. Carrying this over to the experiential case, we get the claim that what happens, when experientiality emerges from non-experientiality, is that there aren't really any new properties involved at all. This, however, means that there were experiential properties all along; which is, precisely, the present claim. One cannot oppose it by appealing to 'neutral monism' in any version that holds that really only the *Z* properties are ultimately real, if this involves the view that experiential and non-experiential properties are at bottom only appearances or seemings. Such a view is incoherent, because experience – appearance, if you like – cannot itself be only appearance, i.e. not really real, because there must be experience for there to be appearance (see Footnote 6).

Some may reject 'intrinsically suited to *constituting* Y' as a gloss on 'proto-X.' In place of 'constituting' they may want to substitute 'giving rise to' or 'producing'; and this may for a moment seem to open up some great new leeway for the idea of radical emergence. The idea will be that X remains *in itself* wholly and utterly non-experiential, but *gives rise to* something wholly ontologically distinct from itself, i.e. Y. But real physicalists can't make this substitution. For everything real and concrete is physical, on their view, and experiential phenomena are real and concrete, on their view, and none of them will I think want to throw away the conservation principles and say that brand new physical stuff (mass/energy) is produced or given rise to when experiences are emergent from the non-experiential, i.e. all the time, as we and other animals live our lives. That is magic again, and I am assured that nothing like this happens with liquidity and Bénard convection cells.

Quite independently of these examples, and the laws of physics, the relevant metaphysical notion of emergence is I think *essentially* conservative in the sense of the conservation principles.

5. Micropsychism

I have been trying to see what can be done for those who want to combine NE and RP and (therefore) hold that the experiential may emerge from the wholly and utterly non-experiential. I looked for other examples of emergence, in case they could help us understand the possibility, at least, of such a thing, but examples like liquidity seemed wholly inadequate, not the right size. I then looked for cases of emergence that promised to be of the right size, but they seemed to describe impossibilities and so backfire, suggesting that there really could not be any such thing as radical non-experiential-to-experiential emergence.

That is what I believe: experiential phenomena cannot be emergent from wholly non-experiential phenomena. The intuition that drives people to dualism (and eliminativism, and all other crazy attempts at wholesale mental-to-non-mental reduction) is correct in holding that you can't get experiential phenomena from P phenomena, i.e. shape-size-mass-charge-etc. phenomena, or, more carefully now – for we can no longer assume that P phenomena as defined really are wholly non-experiential phenomena – from *non-experiential* features of shape-size-mass-charge-etc. phenomena. So if experience like ours (or mouse experience, or sea snail experience) emerges from something that is not experience like ours (or mouse experience, or sea snail experience), then that something must already be experiential in some sense or other. It must already be somehow experiential in its essential and fundamental nature, however primitively or strangely or (to us) incomprehensibly; whether or not it is also non-experiential in its essential nature, as conventional physicalism supposes.

Assuming, then, that there is a plurality of physical ultimates, some of them at least must be intrinsically experiential, intrinsically experience-involving. Otherwise we're back at brutality, magic passage across the experiential/non-experiential divide, something that, *ex hypothesi*, not even God can understand, something for which there is no reason at all as a matter of ultimate metaphysical fact, something that is, therefore, objectively a matter of pure chance every time it occurs, although it is at the same time perfectly lawlike.[37]

I conclude that real physicalists must give up NE.[38] Real physicalists must accept that at least some ultimates are intrinsically experience-involving.[39] They must at least embrace *micropsychism*. Given that everything concrete is physical, and that everything physical is constituted out of physical ultimates, and that experience is part

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37. Note again that this is not a version of the merely epistemological point that all concrete connection (e.g. causal connection) is ultimately unintelligible to us (ultimately 'epistemologically brute' for us).

38. Part of being realistic, evidently, is that one does not treat experience as objectively miraculous every time it occurs.

39. The most ingenious attempt to get round this that I know of is Broad's – see Broad (1925), Chapter 14; and McLaughlin (1992) – but it does not, in the end, work.

of concrete reality, it seems the only reasonable position, more than just an 'inference to the best explanation.' Which is not to say it is easy to accept in the current intellectual climate.

Micropsychism is not yet panpsychism, for as things stand realistic physicalists can conjecture that only some types of ultimates are intrinsically experiential.[40] But they must allow that panpsychism may be true, and the big step has already been taken with micropsychism, the admission that at least some ultimates must be experiential. 'And were the inmost essence of things laid open to us'[41] I think that the idea that some but not all physical ultimates are experiential might look like the idea that some but not all physical ultimates are spatio-temporal (on the assumption that spacetime is indeed a fundamental feature of reality). I would bet a lot against there being such radical heterogeneity at the very bottom of things. In fact (to disagree with my earlier self (Strawson 1994: 77)) it is hard to see why this view would not count as a form of dualism. So I'm going to assume, for the rest of this article at least, that micropsychism is panpsychism.

So now I can say that physicalism, i.e. real physicalism, entails panexperientialism or panpsychism. It entails panpsychism given the impossibility of 'radical' emergence. All physical stuff is energy, in one form or another, and all energy, I trow, is an experience-involving phenomenon. 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 short of 'substance dualism,' a view for which (as Arnauld saw) there has never been any good argument. Real physicalism, realistic physicalism, entails panpsychism, and whatever problems are raised by this fact are problems a real physicalist must face.

They seem very large, these problems (so long as we hold on to the view that there is indeed non-experiential reality). To begin with, 'experience is impossible without an experiencer,' a subject of experience.[42] So we have, with Leibniz, and right at the start, a rather large number of subjects of experience on our hands – if, that is, there are as many ultimates as we ordinarily suppose. I believe that this is not, in fact, a serious problem, however many ultimates there are,[43] but we will also need to apply our minds to the question whether the class of subjects of experience contains only ultimates, on the one hand, and things like ourselves and other whole animals, on the other hand, or whether there are other subjects in between, such as living cells. Panpsychism certainly

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40. They may for example propose (after assuming that the notion of charge has application to ultimates) that only those with electric charge are intrinsically experiential.

41. Echoing Philo, who speaks for Hume in his *Dialogues*: "And were the inmost essence of things laid open to us, we should then discover a scene, of which, at present, we can have no idea. Instead of admiring the order of natural beings, we should clearly see, that it was absolutely impossible for them, in the smallest article, ever to admit of any other disposition" (Hume 1779: 174–175).

42. Frege (1918: 27). No sensible Buddhist rejects such a claim, properly understood.

43. For reasons I lay out in Strawson (2003b).

does not require one to hold the view that things like stones and tables are subjects of experience – I don't believe this for a moment, and it receives no support from the current line of thought – but we will need to address William James's famous objection to the idea that many subjects of experience can somehow constitute a single 'larger' subject of experience.[44] In general, we will have to wonder how macroexperientiality arises from microexperientiality, where by microexperientiality I mean the experientiality of ultimates relative to which all evolved experientiality is macroexperientiality.[45]

We also have to wonder how the solution to the 'problem of mental causation' is going to drop out of all this. We know, though, that different arrangements of a few types of fundamental ultimates give rise to entities (everything in the universe) whose *non*-experiential properties seem remarkably different from the non-experiential properties of those fundamental ultimates, and we have no good reason not to expect the same to hold true on the experiential side. It may be added that there is no more difficulty in the idea that the experiential quality of microexperientiality is unimaginable by us than there is in the idea that there may exist sensory modalities (qualitatively) unimaginable by us.

It is at this point, when we consider the difference between macroexperiential and microexperiential phenomena, that the notion of emergence begins to recover some respectability in its application to the case of experience. For it seems that we can now embrace the analogy with liquidity after all, whose pedagogic value previously seemed to lie precisely in its inadequacy. For we can take it that human or sea snail experientiality emerges from experientiality that is not of the human or sea snail type, just

44. James (1890), Vol. 1, Chapter 6. The following fine passage precedes his statement of the objection: "We need to try every possible mode of conceiving the dawn of consciousness so that it may not appear equivalent to the irruption into the universe of a new nature, non-existent until then. Merely to call the consciousness 'nascent' will not serve our turn. It is true that the word signifies not yet quite born, and so seems to form a sort of bridge between existence and nonentity. But that is a verbal quibble. The fact is that discontinuity comes in if a new nature comes in at all. The quantity of the latter is quite immaterial. The girl in 'Midshipman Easy' could not excuse the illegitimacy of her child by saying, 'it was a very small one.' And Consciousness, however small, is an illegitimate birth in any philosophy that starts without it, and yet professes to explain all facts by continuous evolution. If evolution is to work smoothly, consciousness in some shape must have been present at the very origin of things. Accordingly we find that the more clear-sighted evolutionary philosophers are beginning to posit it there. Each atom of the nebula, they suppose, must have had an aboriginal atom of consciousness linked with it; and, just as the material atoms have formed bodies and brains by massing themselves together, so the mental atoms, by an analogous process of aggregation, have fused into those larger consciousnesses which we know in ourselves and suppose to exist in our fellow-animals" (1890, Vol. 1, pp. 148–149).

45. As Nick White reminded me, we certainly don't have to suppose that microexperientiality is somehow weak or thin or blurry (this is perhaps how some people imagine the most primitive Leibnizian monads). It can be as vivid as an experience of bright red or an electric shock (both of which are 'confused' and 'indistinct' in Leibniz's terms). Compare Rosenberg (2004), Chapter 5.

as the shape-size-mass-charge-etc. phenomenon of liquidity emerges from shape-size-mass-charge-etc. phenomena that do not involve liquidity. Human experience or sea snail experience (if any) is an emergent property of structures of ultimates whose individual experientiality no more resembles human or sea snail experientiality than an electron resembles a molecule, a neuron, a brain, or a human being. Once upon a time there was relatively unorganized matter, with both experiential and non-experiential fundamental features. It organized into increasingly complex forms, both experiential and non-experiential, by many processes including evolution by natural selection. And just as there was spectacular enlargement and fine-tuning of non-experiential forms (the bodies of living things), so too there was spectacular enlargement and fine-tuning of experiential forms.[46]

This is not to advance our detailed understanding in any way. Nor is it to say that we can ever hope to achieve, in the experiential case, the sort of feeling of understanding that we achieve in the liquid case.[47] The present proposal is made at very high level of generality (which is not a virtue); it merely recommends a general framework of thought in which there need be no more sense of a radically unintelligible transition in the case of experientiality than there is in the case of liquidity. It has nothing to offer to scientific test.

One can I think do further work on this general framework, by working on one's general metaphysics. The object/process/property/state/event cluster of distinctions is unexceptionable in everyday life but it is hopelessly superficial from the point of view of science and metaphysics, and one needs to acquire a vivid sense that this is so. One needs a vivid sense of the respect in which (given the spatio-temporal framework) every object is a process; one needs to abandon the idea that there is any sharp or categorical distinction between an object and its propertiedness.[48] One needs to grasp fully the point that 'property dualism,' applied to intrinsic, non-relational properties, is strictly incoherent (or just a way of saying that there are two very different kinds of properties) insofar as it purports to be genuinely distinct from substance dualism, because there is nothing more to a thing's being than its intrinsic, non-relational propertiedness.

We are as inescapably committed to the discursive, subject-predicate form of experience as we are to the spatio-temporal form of experience, but the principal and unmistakable lesson of the endlessness of the debate about the relation between objects

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46. The heart of experience, perhaps, is electromagnetism in some or all its forms, electromagnetism in all its forms being one expression of some single force whose being is intrinsically experiential, whatever else it is or is not. (Unfortunately, I do not foresee any kind of scientific research programme.)

47. Feelings of understanding are just that; they are essentially subjective things with no metaphysical consequences.

48. See e.g. Strawson (2008c), following Nagarjuna, Nietzsche, James, Ramsey, and many others.

and their propertiedness is that discursive thought is not adequate to the nature of reality: we can see that it doesn't get things right although we can't help persisting with it. There is in the nature of the case a limited amount that we can do with such insights, for they are, precisely, insights into how our understanding falls short of reality, but their general lesson – that the nature of reality is in fundamental respects beyond our grasp – needs always to be borne in mind.

I have argued that there are limits on how different X and Y can be (can be intelligibly supposed to be) if it is true that Y emerges from X. You can get A from non-A for some substitutions for A but not all. The extended, I have proposed, can't emerge from the intrinsically wholly non-extended (except on pain of being a mere appearance and so not really real). The spatial can't emerge from the intrinsically wholly non-spatial (except on the same pain). The experiential can't emerge from the intrinsically wholly non-experiential, and it doesn't have the option of being a mere appearance. You can make chalk from cheese, or water from wine, because if you go down to the subatomic level they are both the same stuff, but you can't make experience from something wholly non-experiential. You might as well suppose – to say it once again – that the (ontologically) concrete can emerge from the (ontologically) abstract.[49] I admit I have nothing more to say if you question this 'can't,' but I have some extremely powerful indirect support from Occam's razor and Eddington's notion of silliness.

I finish up, indeed, in the same position as Eddington. "To put the conclusion crudely," he says, "the stuff of the world is mind-stuff" – something whose nature is "not altogether foreign to the feelings in our consciousness." "Having granted this," he continues,

> the mental activity of the part of the world constituting ourselves *occasions no surprise*; it is known to us by direct self-knowledge, and we do not explain it away as something other than we know it to be – or, rather, it knows itself to be. It is the physical aspects (i.e. non-mental aspects) of the world that we have to explain.[50]

Something along these general panpsychist – or at least micropsychist – lines seems to me to be 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.

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49. Objection: the comparison is false because the experiential and the non-experiential are two categories within the concrete.' Reply: the concrete and the abstract are two categories within the real.

50. Eddington (1928: 276–277). 'Mind-stuff' is William James's term: "The theory of 'mind-stuff' is the theory that our mental states... are composite in structure, made up of smaller [mental] states conjoined. This hypothesis has outward advantages which make it almost irresistibly attractive to the intellect, and yet it is inwardly quite unintelligible" (James (1980), Vol. 1, p. 145).

Appendix

On the Sesmet Theory of Subjectivity*

> [The following is adapted from Strawson's response to critics, "Panpsychism? Reply to Commentators with a Celebration of Descartes," which was first published in *Journal of Consciousness Studies*, 13, 10–11 (2006). Here he elaborates on his conception of subjects of experience as 'thin subjects' or 'sesmets.' It is important in the present context as a positive theory of mind that accepts panpsychism. – DS.]

1. What are the prospects for *pure* panpsychism, the view that all being is experiential being? What are the prospects for realistic, naturalistic pure panpsychism?[51] Let me say first that I make no distinction between panpsychism and panexperientialism, because the word 'panpsychism' doesn't have any implications that the word 'panexperientialism' doesn't also have. 'Psyche' was a mass term before it was a count noun, and 'panpsychism' doesn't in itself imply that there are subjects of experience in addition to experiential reality, or indeed that everything that exists involves the existence of a subject of experience in addition to the existence of experiential reality.

It wouldn't matter if 'panpsychism' did carry this implication, though, because it is as Shoemaker says "an obvious conceptual truth that an experiencing is necessarily an experiencing by a subject of experience, and involves that subject as intimately as a branch-bending involves a branch" (1986: 10). There can't be experience without a subject of experience simply because experience is necessarily experience *for* – for someone-or-something. Experience necessarily involves experiential 'what-it-is-likeness,' and experiential what-it-is-likeness is necessarily what-it-is-likeness *for* someone-or-something. Whatever the correct account of the nature of this experiencing something, its existence cannot be denied. "An experience is impossible without an experiencer," in Frege's words (1918: 27). To understand this claim in the sense in which it is intended is to see that it is true.[52] Let no one think that Hume thought otherwise. His target in his discussion of personal identity is certainly not this view, which is after all a necessary truth. It is, as he clearly says, the view, standard in his

* I thank Sam Coleman and David Skrbina for their comments.

51. As on p. 33, I take the first principle of genuine naturalism to be the full acknowledgement of the reality of experience, i.e. conscious experience. The existence of experience is the fundamental natural fact.

52. The claim is in fact analytic, if not obviously so, for to understand what experience is is to understand that it is essentially experience-*for*, in the intended sense. Note that I take 'experience' to cover cognitive phenomenology as well as sensory phenomenology: to cover not just sensory episodes but all conscious mental goings on, including the most abstract conscious thoughts (see Strawson 1994: §1.4; Strawson 2009: §2.6).

time, that the self or subject is something that has "perfect identity and simplicity" and that "continue[s] invariably the same, through the whole course of our lives" (1739–40: 251).

To say that an experience is impossible without an experiencer is not to commit oneself to any particular view about the ultimate ontological category of the necessarily existing subject. It is not (for example) to commit oneself to the idea that it must be an individual substance in any sense of the word 'substance' according to which a substance is understood to be something that stands in fundamental ontological contrast with a property. One can be certain that an experience is impossible without an experiencer while knowing nothing more than Descartes knows in his *Second Meditation* when he says "I know that I exist; the question is, what is this 'I' that I know?" (1641: 18). Descartes stresses the point that he is at this stage entirely uncommitted on the question of the ontological nature of what gets referred to when he says 'I'; he is not ruling out the possibility that it is a "thin vapour which permeates the limbs – a wind, fire, air, breath," or his body.

Kant makes a related move in the Paralogisms sections of the *Critique of Pure Reason* (using for this purpose the terms of the conventional substance/property distinction). One knows that one exists, he says, but it is "quite impossible" for one, given one's self-conscious experience of oneself as a mental phenomenon, "to determine *the manner in which* [one] exist[s], whether it be as substance or as accident" (1781–7: B420, my emphasis). Certainly "the I who thinks or is conscious must *in such thought or consciousness* always be *considered* as a *subject*, and as something that does not merely attach to thought or consciousness like a predicate" (1781–7: B407, first two emphases mine),[53] but – this is Kant's point – nothing follows from this about how things actually are metaphysically. We can acknowledge the certainty of the existence of the subject, the experiencing 'someone-or-something,' while remaining wholly metaphysically neutral as to its ultimate ontological category.

Nothing in Buddhism conflicts with this point when it is understood as it is here (the notion of a subject carries no implication of long-term persistence). If someone agrees that there is necessarily *subjectivity* when there is experience, but not that there is necessarily *a subject of experience*, we have a merely terminological disagreement. For (with Kant and the Descartes of the *Second Meditation*) I understand the word 'subject' in a maximally metaphysically neutral way given which the existence of subjectivity entails the existence of a subject.[54] Isn't it misleading to make the 'experience entails an experiencer' point using nouns like 'experiencer,' 'subject of experience,' or 'someone-or-something?' Doesn't it imply that objects or substances are in question? Well, I've just explicitly cancelled any such implication (while not ruling out that it might in the end be right).

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53. Note that Kemp Smith and Guyer and Wood translate this incorrectly.

54. This is part of the explanation of why Lichtenberg's famous objection to Descartes is no good.

2. It is plain to most philosophers that there can't possibly be experience – experiencing, experiential reality, experiential being (I use these terms interchangeably) – without a subject of experience. What is less plain, or less remarked on, is that there is an important use of the term 'subject of experience' given which the converse is also true. There are two common conceptions of what a subject of experience is. First,

a. the *thick* conception according to which it is only human beings and other animals *considered as a whole* that are properly said to be subjects of experience.

Second,

b. the *traditional* conception of the subject, the traditional *inner* conception according to which the subject *properly or strictly speaking* is some sort of persisting, inner, mentally propertied entity or presence.

I take it that [a] and [b] both build in the assumption that a subject may and standardly does continue to exist even when it is not having any experience (for whether you think that human subjects are whole human beings or whether you think they are inner loci of consciousness, you are likely to allow that they can continue to exist during periods of complete experiencelessness – in periods of dreamless sleep, say), and it is this that creates the need for the third, relatively unfamiliar conception of the subject:

c. the *thin* conception according to which a subject of experience, a true and actual subject of experience, does not and cannot exist without experience also existing, experience which it is having itself.

The thin conception stands opposed to both [a] and [b] precisely because they both contain the ordinary assumption that a subject of experience can be said to exist in the absence of any experience.

As it stands, the thin conception doesn't offer any support to the idea that thin subjects (as I will call them) are short-lived or transient entities. I suspect that they are always short-lived in the human case, as a matter of empirical fact, that the stream of human experience is constantly interrupted, in large ways and small, but Cartesian subjects also qualify as thin subjects by the present definition, and they are long-lived, possibly immortal.[55]

There is a problem of exposition here, because most are so accustomed to [a] and/or [b], and to the idea that they exhaust the options, that they cannot take [c] seriously. And yet [c] simply makes a place for a natural use of the term 'subject' according to which it is a necessary truth, no less, that

55. Cartesian minds can't exist without experiencing. Other thinkers whose subjects are 'thin' in this sense include Leibniz, whose subjects are like Descartes's long-lived. On the short-lived side we find William James, Buddhists, who are sometimes wrongly supposed to deny the existence of subjects of experience, and, arguably, Fichte. Hume's more cautious, epistomological view is there is no empirical evidence for anything other than short-lived thin subjects.

> there cannot be an actual *subject of experience*, at any given time, unless some *experience* exists for it to be a subject *of*, at that time.

On this view, there can no more be a subject of experience without an experience than there can be a surface without extension.

In what follows I'm going to mean 'thin' subjects, when I speak of subjects of experience, and I propose to call them 'sesmets,' an acronym that stands for *subject of experience that is a single mental thing*, or more precisely: subject of experience that is correctly judged to be a single thing when considered specifically as a subject of experience that is being considered specifically in its mental being, and so without regard to any non-mental being that it may have.[56] My pure panpsychist proposal is that they are the only things that exist (it is not as if the existence of experience is somehow something over and above the existence of sesmets). I take a sesmet to be a portion of energy-stuff, just as physicists take any portion of matter to be a certain kind of energy-stuff (I take it, in fact, that we're talking about the same thing). I assume that there is more than one of them at any given time. This corresponds to the assumption (see p. 38) that there is a plurality of ultimate constituents of reality or 'ultimates,' whether they're best thought of as standard-model 'fundamental particles,' or 'field quanta,' or 'strings,' or 'loops,' or 'simples,' or 'preons' (whether simple or 'braided'), or.... Evidently all ultimates are sesmets, on this view, and I take it that some but not all pluralities of sesmets constitute further numerically distinct sesmets – perhaps in some Bohmian way. I take it, in other words, that not every plurality of sesmets constitutes a further sesmet (without claiming to know this with certainty).[57]

3. With this in place, consider an experience of mine, e_1, with which I necessarily (by definition) have direct, 'from-the-inside' acquaintance. The proposal is that e_1 may be somehow constitutively composed of many 'small' experiences e_2–e_n with which I have no such direct from-the-inside acquaintance (equally necessarily, for they are the experiences of numerically distinct subjects). This is how it must be, I think, if any realistic and 'smallist'[58] version of pure panpsychism (the view all being is experiential being) is to stand up, for we are trying to give an account of our own experience, and in having an experience we have no experience of ourselves as somehow being many subjects of experience. The idea that one subject may be somehow constituted of many

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56. See Strawson 2009: §4.9, where the notion is explained in detail. Note that it is not an intrinsically panpsychist notion.

57. One no longer has any right to be impressed by 'spatial separation' (whatever the ultimate nature of space), and we are taught that particles light years apart may be 'entangled' in such a way as to put their real or ontological distinctness in question (especially once we have a correct metaphysics of object and property).

58. For 'smallist' see Coleman 2006.

other distinct subjects is famously difficult (see James 1890: 1.160–161; Goff 2006) but I cannot avoid the difficulty in the way Coleman can (2006: 48–50), by proposing that an experience of mine may be somehow composed of many experiences whose existence does not essentially involve subjects of experience. This is not only because I take it that there cannot be an experience without a subject of experience, but also because I believe in the ultimate identity of experience and experiencer.[59] I think, like Kant, that "the thinking or the existence of the thought [experience] and the existence of my own self are one and the same" (Letter to Herz 1772: 75).

The expression 'from-the-inside' is not entirely stable, but it's very natural in this context, and it offers one way of making a distinction that must I think be made in some way if realistic smallist pure panpsychism is to have any chance of being true. It may also lead us forward in a crucial way, because it may give us a first intimation of how pure panpsychist monism can allow some sort of fundamental and all-pervasive dual*ity* to existence even as it shuns any dual*ism* (a glimmering of the possibility that 'ESFD monism'[60] may be intelligible after all). And this, perhaps, is just as well, for it is extremely plausible to think that we cannot in the end do without some such duality.[61] It cannot be a betrayal of pure panpsychism to require this, if pure panpsychism as I understand it is to have any realistic chance of being true, for it must I take it accommodate the existence of such real natural facts as the facts of (say) reproduction and evolution. Pure panpsychism as I understand it gives a wholly *mentalist* account of the nature of the entities, the ultimates, that constitute the existence of the phenomena of (say) reproduction and evolution, and hence of the phenomena of reproduction and evolution themselves, but it does not give any sort of *idealist* account of these phenomena, if by this is meant an account of ultimates as somehow nothing more than the content of ideas in someone's mind and in that intuitive sense not really real after all.[62]

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59. For the argument see Strawson 2008b; 2009: §§8.8–10. As I understand them, Descartes, Spinoza and James – among others – agree.

60. According to "Equal-Status Fundamental-Duality monism [1] reality is a substantially single [2] all reality is experiential and all reality is non-experiential [3] experiential and non-experiential being exist in such a way that neither can be said to be based in or realized by or in any way asymmetrically dependent on the other" (Strawson 2006: 241, adapted from Strawson 1994: 56).

61. Skrbina (2006b: 153) remarks that my position is one of "dual-aspect monism…an approach that dates back at least to Spinoza…and strongly urges one toward panpsychism."

62. The term 'idealist' is standardly misused where 'mentalist' is appropriate. Berkeley, for example, was an idealist *about the world of tables or chairs*, but he was not of course an idealist in his basic ontology. He was a mentalist, who (crucially) admitted the existence of things that were not ideas. See Strawson 1994: Chapter 5. I fear that the chances of correcting this misuse are vanishingly small.

A first, inadequate way to express the idea of duality is to say that while an experience, a sesmet, a piece of energy-stuff, say e_1, necessarily has a (from-the-inside) 'inside,' i.e. its experientiality-as-experienced, which is its essential nature, it must also, as energy-stuff, have an 'outside,' which is no less part of its essential nature. By this, though, I mean only that its existence must affect other sesmets; e_1's outside is not something ontologically extra. I take 'inside' from 'from-the-inside,' aware that the words 'inside' and 'outside' are almost bound to mislead (quite apart from being spatial metaphors), for it is not as if any sort of non-experiential stuff is being introduced, in talking of the 'outside' of the experience: it remains central to the present view that the inside of an experience or sesmet like e_1, i.e. its experiential nature, is its whole essential nature, its whole being.

"e_1's outside is not something ontologically extra." What is it, then? Two main issues arise, with respect to its outside: the issue of causation and the issue of constitution. With respect to causation, we may say that e_1's outside is just a matter of how e_1 is disposed to interact with other sesmets, other portions of experiential[63] energy-stuff, given its own experiential energy-stuff inside. With respect to constitution, we may say that it is a matter of how e_1 is constituted of numerically distinct sesmets e_2–e_n.[64]

Mysterious, you may say; but the proposal about causation returns us to a crucial point that surfaces in the discussion of Descartes (in Strawson 2006: 199–216) and has already been drawn on. This is the point that experience cannot be thought of as just passive content, in any plausible (reproduction-and-evolution-allowing) pure panpsychism, but must always be understood to be active stuff or substance (in the mass term, non-count-noun sense of 'substance'). *Experience is itself active substance* (and conversely).[65]

I think that this, too, is a difficult idea for many of us, and that effective grasp of it requires considerable acclimatization, but the basic smallist picture remains plain for all that. Many believe that it is legitimate to think of our actual world, conceived of as involving non-experiential substance (substance that is not experience), as in some sense composed wholly of energy, in various forms, and the present (Eddingtonian) suggestion is simply that the intrinsic nature of that energy is in fact experience.

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63. The word 'experiential' is redundant.

64. I refrain from saying that e_1's inside, i.e. its experiential nature, is wholly non-relational, for I take it that its experiential nature will be partly a function of its interactions with other sesmets. The effect that e_1 has on e_{n+1} will indeed be wholly a function of its experiential nature, but its experiential nature may be partly a function of how it is being affected by e_{n+2}. Great complications lie here, no doubt, about which I have said nothing (Mach's famous principle – that everything in the universe if affected by everything else – comes to mind).

65. All substance is active, as Leibniz says (activity does not imply any sort of intentional agency).

If so, everything that exists, everything studied by physics, including of course reproduction and evolution realistically understood, is left in place by the pure panpsychist hypothesis.

One principal reason why it's difficult to think of what I am calling 'experience' as a kind of energetic stuff is that we have, as previously noted, a tendency to think of it as 'just' content, experiential content conceived of as something passive, content contained in a container. It's fine to think of it in this way in some philosophical contexts, but it is hopelessly obstructive in the present context, and one way to try to offset the obstruction is to speak instead of *experiencing*. My first impulse is to add immediately that 'experiencing' in this use is not just a verbal noun denoting an activity, but a noun denoting a certain sort of stuff. This, however, obscures the deeper point, which is that the activity in question is the stuff in question.

4. There is, then, causation between sesmets (in addition to relations of constitution). But where – in what ontological dimension or 'dimension-space' – does this causation (and constitution) take place? Well, we must as pure panpsychists suppose that the dimension-space of the concrete real, although not understood by us, is something that fits with the nature of the concrete real conceived of as nothing but experiencing in exactly the same general way as the way in which the dimension-space of physical space or spacetime (which is certainly not understood by us) fits with the nature of the concrete real conceived of as nothing but good old fashioned non-experientially propertied extended physical stuff.

The causal effect of anything on anything will have an experiential aspect, will indeed be experiential, and this is why even microsubjects – sesmets that are ultimates – may reasonably be said to have sensation, and intentionality, and to represent things (rather than just having some sort of non-sensational, non-intentional 'bare' experientiality). There is no more difficulty in the idea that ultimate sesmets have sensation and intentionality and represent things than there is in the idea that one particle exerts attribute or repulsive force on another – for these are in fact the same thing. Doubtless this intentionality will not be explicit conceptual intentionality. Nevertheless the experiential event that is particle *a*'s registering what physics describes as the 'repulsive force' of particle *b* (which is itself an experiential phenomenon) may be said to be of or about particle *b*.[66]

Might we in the end have to posit a universe-wide sesmet in order to posit the existence of many sesmets existing in a dimension that allows for their interaction? I've been assuming that the answer is No, but I would not be much troubled if it were Yes, first because the universe-wide sesmet would have no more to do with religion than the view that there is a single universe, second because of a methodological principle

66. In Strawson 2008a I consider particles' claim to have intentionality in a context in which I put aside panpsychism.

integral to serious naturalism: if one finds oneself pushed towards an apparently extraordinary hypothesis like panpsychism, when one is trying to account for the given natural facts, of which the first and most fundamental is and will always be the fact of experience, one should bear in mind the certainly equal and arguably much greater extraordinariness of many of the hypotheses seriously entertained, and in some cases well supported, in present-day physics and cosmology.

All this needs, to put it mildly, development. The basic proposal is that ultimates – sesmets – experiencing(s) – can be as they are to themselves, and their being as they are to themselves can be what they are, intrinsically, compatibly with their having causal effects on other sesmets and compatibly with their playing a part in constituting other numerically distinct sesmets (sesmets that are not only numerically but also qualitatively distinct). They have the effects or constituting roles they have wholly in virtue of their experiential being, which is all the being they have, and yet when one sesmet or (portion of) experiencing affects another, in accordance with the Laws of Experiential Nature, whatever they are, or goes to constitute another, in accordance with those Laws of Experiential Nature that are Laws of Experiential Composition, the second will obviously not experience the from-the-inside nature of the first in the way in which only the first can. Nor is there any more reason to think that the second will take on the experiential character of the first, in some direct way, in the case of interaction, than there is to think that a positively charged particle will in some direct way take on the character of a negatively charged particle with which it is in interaction – a point independent of the fact that the second of these two phenomena is, on the current view, an instance of the first.[67] In this sense experiential realities may be said to *function* as non-experiential but experience-causing realities for other experiential realities, although there is no non-experiential being. One might say that although there is no non-experiential being absolutely speaking, there is non-experiential being relatively or relationally speaking. . . .

5. This may seem like uncontrolled speculation. But it is not entirely uncontrolled, and it is not unwarranted, because I am not defending a thesis that is already crazy and that is now pushing me into further craziness. The dialectical situation is rather this. A hard and genuinely naturalistic nose for reality obliges one to endorse some sort of panpsychism (or at least micropsychism – see p. 53) long before any wild speculation has taken place, for 'radical' emergence (see p. 43) is impossible. Given that one then knows that some sort of panpsychism must be true, speculation as to how it could be true is fully licensed, and strongly to be encouraged. "The truth. . .*must* be strange" in this area, as Russell once said (1912: 19), and we have

67. What about the case of composition? Unfortunately I know nothing about the Laws of Experiential Composition – but they may involve something like Bohm's enfoldedness or 'implicate order' (Bohm 1986; see also Schaffter 2006).

to do our best to understand how what must be true could be true. So when Goff says (2006: 60) that I have nothing to offer on the question of how macroexperientiality emerges from microexperientiality, only "faith that *it must happen somehow*," I enthusiastically agree, and am happy to find the James of *A Pluralistic Universe* (1909) by my side in spite of the powerful doubts expressed in his earlier *Principles of Psychology* (1890).

CHAPTER 3

Halting the descent into panpsychism*

A quantum thermofield theoretical perspective

Gordon G. Globus

The seeming impossibility of any "brute emergence" of the experiential from the physical has been considered a compelling argument in favor of panpsychism.

> 'Radical kind', or brute emergence is impossible, i.e. mental phenomena cannot arise from any purely non-mental stuff (which exhibits only shape-size-mass-charge-etc. phenomena). (Skrbina 2006b: 153)

Since mind cannot plausibly emerge from non-mental matter, "the only alternative is to see all matter as in some sense enminded" (ibid.: 152). Conversely put, panexperientialists believe that there is no point or region on the complexity of matter dimension where, as Stubenberg (2007) puts it, "the descent into panpsychism" might be halted. If implausible that the 'mental' could emerge from non-conscious matter, then it would follow that even the most primitive forms of matter already have mind in some suitably primitive sense.

> [T]here must be something about the nature of the emerged-from (and nothing else) in virtue of which the emerged emerges as it does and is what it is. (Strawson 2006: 15)

This is at heart *a theory of production*, both of producer (the "emerged-from") and the product emergent in the dynamics of production. This theory remains metaphysical, since the "something about the nature of the emerged-from" is an active principle tantamount to subjectivity, mind, consciousness – call it what you will – that guides the emergence. Strawson (2006, 2006b) offers a metaphysical panpsychism.

The present chapter challenges the claim that no line can be drawn in the physical realm at which novel emergence appears. Quantum thermofield dynamics does in fact prescribe a lower boundary below which there can be no cooperative dynamics, and without cooperative dynamics there is nothing mind-like, just the tedious random noise of fully thermalized systems. That is, cooperative dynamics is an emergent

* I thank David Skrbina for insightful comments on an earlier draft of the chapter.

at the domain level, absent from uncorrelated subdomain dynamics, whereas qualia require cooperative dynamics. Quantum thermofield dynamics defines "domain structures" whose subdomain regions are in principle not experiential. Lacking qualia, such subdomain regions halt the descent into panpsychism.

If science might halt the descent into panpsychism, then quantum science would seem to be a good place to look, since such strange things happen there. Especially relevant would be quantum brain science, which has become well-developed over the last forty years. The first systematic inquiries into quantum brain were by Ricciardi and Umezawa (1967) and by Fröhlich (1968). The Umezawa tradition featured an explanation of memory and the Fröhlich tradition focused more on information processing and transmission. These traditions appear consistent (as in the collaboration found in Jibu et al. 1994).

Arguably the three most elaborated proposals in quantum brain discourse[1] are by:

(1) Hameroff and Penrose, in the tradition of Fröhlich. (See Hameroff (1998c, 2003, 2006, this volume), Penrose (1989, 1994), and Hameroff and Penrose (1996a).)

(2) Jibu & Yasue and Vitiello, inspired by Umezawa (1993). (See Freeman and Vitello (2006), Globus (2003, 2004, 2006), Jibu & Yasue (1995, 2004), Umezawa (1993) and Vitiello (1995, 2001, 2004).)

(3) Stapp (2004, 2007), who is close to neither Fröhlich nor Umezawa, instead comes to quantum brain theory out of the Copenhagen Interpretation in quantum physics.

Stapp's view of panpsychism will be first discussed, then the "panprotopsychism" of Hameroff and Penrose, and finally a thermofield approach will be developed.

1. Terminology

Some are discomforted by the term 'panpsychism' and prefer the more august-sounding 'panexperientialism.' Still, what counts as 'experience'? Here things become murky. Holman's (2008) relevant discussion, which takes place in the context of Russell's philosophy, shows symptoms of distress.

> I have been using 'panpsychism' as a generic term that subsumes what is often called 'pan-experientialism'. I have also been using 'phenomenal' and 'conscious' more or less interchangeably and subsuming them under 'mental'. But there are those who would insist that the phenomenal is not the same as the conscious, and/or that one or the other, or both, should not be subsumed under the mental...

1. The online journals *Neuroquantology* and *Quantum Biosystems* offer access to a wide range of quantum brain theories.

> Is the right sense of 'physical' non-mental, non-conscious, non-phenomenal, non-experiential, or what? (p. 57)

Holman is impatient with the obscurity. He simply stipulates that "the conscious, phenomenal and experiential are equivalent … they are all mental." He finally sighs ambivalently, "… we may as well adopt whatever terminological stipulations are convenient (within *some* limits of course)" (58). Holman ends up using the term 'panpsychism' "in a broad generic way." My predilection is for the more detached Greek symbol ψ (though the meaning of 'psyche' unfortunately still clings to it). The issue can then be rephrased: Does ψ descend all the way to Planck scale? Or are there physical reasons that ψ's descension must halt? The problematic of the present volume remains unaffected by such a terminological shift but its use might help loosen unnoticed metaphysical commitments.

2. Protoconsciousness at Planck scale geometry

Penrose and Hameroff introduce a qualitative "protoconsciousness" into ontology. There are *precursors* to qualia which are brute facts, "primitive fundamental aspects of reality, irreducible to anything else, something like spin, or charge" (Hameroff 2000: 11). All matter at the quantum level is thought to be protoconscious; the brain is but where the potentialities of protoconsciousness might become a full-fledged consciousness.

> Protoconscious qualia are *presumed* to exist in Planck scale [1.6×10^{-35} m.] geometry everywhere, including the space-time geometry within the brain. Because space-time at the Planck scale is nonlocal (e.g. as entanglement according to Penrose) the Planck scale configurations manifesting a particular set of qualia would exist both in the external world and in the brain.
>
> (Hameroff 2006: 240, italics added)

Protoconscious qualia can be "objectively reduced" (OR) to qualia. In the case of the living brain, this objective reduction is sensitively constrained, "orchestrated" (Orch-OR).

> Large-scale quantum superpositions may exist naturally in the universe, for example in the cores of neutron stars, or the very early universe, able to reach OR threshold quickly. Such OR events would presumably lack organization information and cognition (OR without Orch). But to be consistent with the Orch OR criteria, yes, they would be conscious/have conscious experience, perhaps as flashes of meaningless awareness. (ibid.: 241)

The brain specializes in orchestration, in constraint that "reduces" the possibilities enfolded to the Schrödinger wave function, objectively reduces these weighted possibilities to a specific actuality. But there are also a priori "Platonic influences" embedded at the Planck scale, according to the Hameroff/Penrose view – non-computable

"Platonic values" embedded in space-time geometry, constraint by profound, timeless and universal mathematical forms that participate in objective reduction to the world.

It should be noted that Penrose (1993) is quite tentative in his speculation. He asserts that his "purpose" in Part II of his book is "to search, within scientific explanation, for some place where subjective experience might find a physical home" (p. 406), but admits that he does not find it.

> I must make clear…that the arguments I have been presenting have very little to say on the positive side. They say that present-day computers are not conscious, but they do not have much to say about when an object *would* be expected to be conscious.

Penrose puts his faith in future science. There is a profound mystery, he thinks,

> of how it is that perceiving beings can arise from out of the physical world. How is it that subtly organized material objects can mysteriously conjure up mental entities from out of its material substance? (pp. 413–414)

> We simply do not know the nature of matter and the laws that govern it, to an extent that we shall need in order to understand what kind of organization it is, in the physical world, which gives rise to conscious beings. (p. 419)

> [O]ur mental existence emerges from but a minute portion of the physical world – a portion where conditions are organized in the very precise way needed for consciousness to arise, as in human brains. (pp. 417–418)

Penrose believes that qualia and intentionality will ultimately be scientifically comprehensible at Planck scale.

Hameroff dwells less in Penrosian puzzlement and instead flatly rejoices in the theory's global consistency.

> To be consistent: 1) all quantum superpositions are protoconscious, and 2) any Penrose OR [orchestrated reduction] must be conscious [qualitative], regardless of where or how it occurs. (2006: 240, brackets added)

Hameroff adds perspicuously that the rich consciousness that we happen to enjoy is an evolutionary achievement, founded in the presumed proto-consciousness of all matter. There is no place to draw a line below which qualia and intentionality are absent, no way to halt the descent into panpsychism, according to this view.

3. Panpsychism and Copenhagenism

Stapp accepts the conventional panexperientialist argument that nothing impedes the descent into some sort of experience at the most fundamental level.

> Ontological uniformity requires, plausibly, every such quantum event to have some experiential component or felt component. But it does not require every

> actual occasion to have the full richness of a fully developed 'high grade' human experience. The richness of the experience would naturally be expected to be correlated with the complexity of the physical system... (2007: 108)

Stapp's panexperientialism is as pure as that of Hameroff and Penrose.

There appear to be two versions of Stapp's panexperientialism which are not clearly discriminated. In a 1993 paper (Stapp 2004, Chapter 11) influenced by Bohr, experience is not a "component," not "correlated" with another physical component, but the true form of reality, which is "idealike." The evolving quantum state is "idealike in character rather than matterlike, apart from its conformity to mathematical rules" (p. 223). Bohr was an operationalist. What science does is track down relationships between our experiences: "... the goal of science is to augment and order our experience..." (1958: 60). As Stapp points out (p. 223), in classical physics there was no natural place for mind, but in quantum physics there is no natural place for matter. This relieves panpsychism of considerable perplexity; it not only gets in on the ground floor but it *is* the ground floor.

In quantum physics there are abrupt transitions between the possible and the actual. The possibilities are enfolded to the Schrödinger wave function and on measurement there is wave function 'collapse' to an actual state. Now measurement presupposes a consciousness that *decides* what measurement to make on the quantum preparation (e.g. Schrödinger's famous cat contrived to be in a superposition of dead state and alive state).[2] Stapp calls this decision[3] the "von Neumann choice" and emphasizes that nothing in quantum theory explains this free choice. Unmeasured, the wave function would continue merrily on its linear way.

Under the 'Born interpretation' vital to Copenhagenism, the wave function is conceived as a 'wave of probability.' What collapses on measurement is our uncertainty; our probabilistic knowledge reduces to a certain perception. Stapp thinks that potentialities and probabilities are idealike, rather than matterlike; his theory is idealistic. But these potentialities and probabilities are by no means purely abstract entities; they are probabilized potentialities *for actual collapses*. Thus the seemingly idealistic interpretation offered by Stapp, which extends Bohr's phenomenalism, already assumes observables, and so is no true idealism.

---

2. The Schrödinger *gedanken* experiment creates within a macroscopic box a macroscopic superposition where the macroscopic object that is a dead cat is entangled (interpenetrated) with a macroscopic object that is a live one, and only measurement – the von Neumann choice to open the box, a choice that lies outside of anything implied by the equations of quantum physics – only measurement brings about wave function collapse so that the observer perceives either a dead cat or a live one, of equal probability.

3. The literal meaning of de-cision is to cut-off. Here the von Neumann consciousness is cut off from quantum physical reality while acting upon it, which is traditional meta-physics.

Heisenberg (1958) broke from strict Copenhagenism and ontologized its epistemological predilections. The wave function and its collapse are no longer to be thought of as requiring the intervention of subjectivity.

> [T]he transition from the "possible" to the "actual" takes place as soon as the interaction between the [atomic] object and the measuring device, and thereby with the rest of the world, has come into play; it is not connected with the act of registration of the result in the mind of the observer. (p. 54)

As Stapp (2006) expresses Heisenberg's realism, which runs counter to Bohr,

> [T]here are also some real "happenings" outside the minds of the human observers, and. . .these external events have the character of transitions of the "possible" to the "actual." (p. 222)

Stapp waffles between Heisenberg's physicalistic realism and Bohr's idealistic tendencies.

> Quantum theory can thus be viewed as a brand of physicalism. . . On the other hand, since quantum theory is built upon experiences, one might also be justified in calling it idealistic. Indeed, the actual events of quantum theory are experienced increments in knowledge, and hence are idealike, and the evolving quantum state represents *a state of knowledge*, which is also an idea-like reality. (2006: 167–168)

Stapp ends up with a type of double aspect theory that sweeps under the rug the deep conflict between Bohr and Heisenberg. Physicalism and idealism are different "labels [that] merely emphasize two different aspects of one logically coherent contemporary understanding of nature" (p. 168). The panpsychism of Stapp's idealism is ontologically primary while the panpsychism of his neutral monism shares honors with the physical, an "aspect" that all matter has. In either case, Stapp unhesitatingly descends into panexperientialism.

4. Quantum thermofield dynamics

It is a common misapprehension that quantum theory only applies to the microscopic scale, and that at the macroscopic scale of the living brain, classical physics prevails. By the expedient fiat of 'letting Planck's constant go to zero,' quantum jumps disappear and the equations are left classical. Condensed matter physics, however, well describes macroscopic quantum objects, including boundary structures at which other macroscopic quantum objects and empty space are tangential. *Thus quantum field theory applies at all scales.* (Nor does it require a temperature near absolute zero for condensation to take place.) The perplexing issue is how to get from quantum macroscopic objects to a perceptible world. This is known as the 'measurement problem,' which remains peculiarly unresolved to this day, while quantum physics and its applications continue in spectacular advance. This suggests that the divide between macroscopic quantum object and macroscopic world object is a philosophical problem, where unresolved disputes are characteristic.

a. Domain structure

The macroscopic quantum object arises in the cooperative dynamics of immensely large numbers of quanta which are coherent. *There is a spatial limit below which such a macroscopic condensation cannot occur*, called the 'coherence length.' This leaves the quantum field structure divided into 'domains,' whose size is determined by the coherence length, which varies greatly for different substances (e.g. nanometers for superconductors, microns for water). Domains may coalesce into much larger super-domains where the dynamics remain cooperative, but at less than the coherence length the quanta must be uncorrelated.

The concept of a domain can be illustrated by water molecules, whose properties support the living brain's extraordinary capabilities. Water molecules fill and surround the neuronal 'microtubules' at the nanolevel (10^{-9} m.), forming an unstable lattice structure with the water molecules at the lattice nodes. For the quantum field generated by these quasi-crystalline water molecules deep within the brain, the coherence length is 50 microns, which is gigantic compared to the Planck scale (10^{-33} cm.) that Penrose and Hameroff are so enamored of. Below the 50 micron threshold, cooperative dynamics cannot be sustained in water; likewise at less than the coherence length for any substance macroscopic quantum objects with boundary structures do not form. Above that threshold condensations of macroscopic extent may take place. If qualia were tied to the coherence of cooperative dynamics, then the descent into panpsychism would halt at the coherence length. An absolute panpsychism would be blocked by the domain structure of macroscopic quantum systems in quantum field theory, leaving a 'restricted panpsychism.'

b. Symmetry and symmetry-breaking

In quantum field theory the ancient, often mystical, idea of fullness – the *plenum* – is reinvigorated in the central concept of "symmetry." (For a general discussion of symmetry see Brading & Castellani 2008.) *Symmetry is an undifferentiatedness of possibilities*. When symmetry is 'broken,' a distinction is made, something differs, there is particular order. Quantum field theory offers an account of symmetry and symmetry-breaking. (For detailed discussions see Jibu et al. (1993), Jibu and Yasue (1999, 2004) and Vitiello (2001, 2004).)

There are many types of symmetry and by changing a system's parameters emergent symmetries may be generated. Thus symmetry is not monolithic. A simple illustration is the 'translational symmetry.' A gas has translational symmetry. Think of gas molecules as occupying randomly scattered points on an X-Y plane and then continuously shift all the points in some direction. Nothing really changes; the points are still randomly scattered, their symmetry unbroken.

A crystal, in contrast, breaks continuous space translation symmetry. In the crystal phase of a substance the atoms are located at nodes, forming a lattice structure. All points of the lattice cannot be occupied by atoms; only certain spatial points are permitted, viz. the equally spaced nodes. There is a demand for certain locations. In contrast, when the crystal is heated, melts and becomes a gas, any spatial point may be occupied by an atom of the gas phase. The gaseous phase has 'translational symmetry,' the points in space are undistinguished, one as good as any other for locating a gas molecule. Translational symmetry is lost in the crystal phase in which nodal points are sharply distinguished from the rest. When the gas recrystallizes on lowering of the temperature, its translational symmetry is broken.

Under energy conservation law the symmetry lost in the crystal phase must be preserved by massless (energyless) bosons, in this case called 'phonons.' So in the translational symmetry-breaking of crystals, the undifferentiated plenum of symmetry realizes distinctions and the information is conserved by boson condensation. These are known collectively as 'Goldstone condensates.' There is an undifferentiated plenum which can differentiate into macroscopic domains manifesting Goldstone condensation of massless bosons in a cooperative dynamics.

Ferromagnets are also illustrative of symmetry-breaking. We consider a compass whose needle is not magnetized. There is no distinction between the various directions in which the needle may point. For an unmagnetized compass needle no direction is preferred. The symmetry here is rotational; all directions of pointing are equivalent, undifferentiated. When the compass needle is magnetized, however, it prefers pointing to the magnetic north pole. One direction is distinguished, which breaks the rotational symmetry of the unmagnetized needle. The quanta of Goldstone condensates which preserve the symmetry broken on magnetization and carry order in their cooperative dynamics are called 'magnons.'

Now water molecules, within and without the nanolevel microtubules inside the neurons, are electric dipoles rather than magnetic dipoles, which might be imagined as spinning two-pointed tops with opposite charge at the tips. Here it is the electric dipole moment vectors, pointing every which-way, that provides the infinite fullness of symmetry. Rotate each vector to the same degree and the overall dynamics do not change; rotational symmetry is conserved. This symmetry is spontaneously broken in the case of the vacuum state. When the dipoles reach zero energy (fluctuating slightly around zero energy) they correlate and form a condensate within the domain structure. In the vacuum state the dipoles align in their cooperative dynamics. The vacuum state of the water dipole field is of the 'spontaneous symmetry-breaking type.'

So in the case of the living brain, when incoming sensory order dissipates its energy and falls into the vacuum state, the electric dipole vectors' rotational symmetry is broken and the vectors all point in the same direction, specific for the particular input. Their dynamics has become co-operative, a 'correlated dynamics,' which differentiates the plenum of symmetry. The symmetry lost (order gained) in such an alignment is conserved by condensation of Goldstone bosons in the vacuum state, in a global dynamics of macroscopic extent. *Such cooperative dynamics provides a trace of input.*

It was the infinite possibilities for memory offered by symmetry-breaking that originally attracted Umezawa and coworkers to develop a quantum brain theory, more fully elaborated by Jibu and Yasue (1995, 2004) and Vitiello (2001, 2004). *There is an infinite possibility for memory in brain vacuum states, founded in their plenum.* "The" vacuum state is actually an infinity of "theta" vacuum states, each capable of storing trace. (The trace will decay in time due to quantum tunneling (Jibu & Yasue 1995).) The θ-vacua undergo transitions under the Bogoliubov transformation which carries vectors to superpositions of vectors. Of great importance, the θ-vacua are "unitarily inequivalent," their transitions irreversible. (In quantum mechanics the transformations are unitarily equivalent and so time is reversible, as in classical physics including relativity theory.) Trace thus gives time its arrow, as Vitiello (2001) emphasizes.

In the case of the brain's water dipole fields the Goldstone bosons which conserve the vacuum state's broken symmetry were called "symmetron" condensates by Umezawa and coworkers, since they preserve the symmetry broken by order falling into the vacuum state. (The source of order may be both exogenous to the brain and of endogenous brain origin.) Quanta excited out of the vacuum state are the "corticons," and when they dissipate their energy and fall back into the vacuum state, symmetry is again broken and again conserved in the cooperative dynamics of the symmetrons. This means that memory is a "total memory," continually supplemented by new traces. (The idea that nothing is lost is foreseen by Whitehead's (1929, part V, Chapter 2) concept of "the consequent nature of God." For Whitehead God is literally a savior, through God's consequent capacity for trace.) The θ-vacua of the water electric dipole field are an infinite resource for traces of broken symmetry, a total memory subject to decay over time by random quantum tunneling.

c. Qualia and emergent symmetries

Since qualia are known (in Russell's (1948) terms) only by "direct acquaintance" and we can know the "intrinsic properties" of world objects, including other human beings, only "by description," then an explanation of qualia relies on the attractiveness of the overall theoretical framework. Whether qualia lie at Planck scale, as Hameroff and Penrose (1996a) think, or above the coherence length as proposed here, calls for thoughtful discussion.

Of course the very existence of qualia are highly controversial. The conventional view is that qualia have to do with brain "representations" of the world (e.g. Metzinger 2003; Revonsuo 2006). Qualia here are inside the head. An alternative view (Honderich 2006; O'Regan and Nöe 2001; Tye 1995, 2007; Velmans 2000), subscribed to here, is that qualia are properties of the world. Here a red 'quale' is the surface color of a ripe tomato right there on your plate. There are no qualitative sensations in addition, though ordinary language embodies the conventional notion that there are. At least, if there are qualia, they are purely *theoretical* entities never experienced, as Sellars (1963) made clear long ago.

The present application of thermofield brain dynamics associates qualia with "emergent brain symmetries." Qualia are true emergents. The differences between qualia are accounted for by there being not just one kind of symmetry. Change parameters of the dynamical equation that governs a system and new types of symmetry emerge, different undifferentiatednesses, each with distinct breakings of symmetry. (See Umezawa 1993, 6.1.10.) Each symmetry has a quale. Symmetry differs across brain regions subserving seeing and hearing, and so their quales differ. There are parametric differences between the symmetries emerging in different regions of cortex (Chakraborty, Sandberg & Greenfield 2007), parameters which govern the type of symmetry that emerges. The quale will accordingly differ across these regions. The rationale for conceiving qualia as true emergents based in emergent symmetries of the domain structure will be further elaborated below.

d. Thermofield dynamics: A new form of duality

Quantum field theory assumes a thermal equilibrium that can be treated statistically and does not apply to living dissipative systems like the brain.

> The basic assumption of quantum statistical mechanics is to incorporate an approximative viewpoint that typical physical characteristics of macroscopic matter in thermal equilibrium are the same as those of less complex systems of ideal disordered atomic ingredients without mutual correlation... [M]acroscopic matter in thermal equilibrium can be thought of as a complex system of atomic ingredients manifesting completely disordered (i.e., uncorrelated or thermalized) dynamics so that quantum statistical mechanics happens to give appropriate approximations.
> (Jibu & Yasue 2004: 270)

When a true thermal degree of freedom is added to quantum field theory, which becomes "quantum thermofield theory" (Umezawa 1993), then dissipative living systems which are not at thermal equilibrium can be encompassed. ("Dissipative" means that the system can store energy (increase negentropy) without heating up and later dissipate it back to the environment.) Quantum thermofield theory is applicable to brain functioning, exploiting the possibilities of thermofield dynamics.

Quantum thermofield theory embraces a new kind of ontological duality, quite distinct from the traditional substance duality of Descartes, the double aspects of Spinozan neutral monism, and the parallel duals of Leibniz. The new duality is between a *system mode* and its *heat bath mode*. The heat bath is the 'environment' of the system. The total energy of the dual modes must remain constant under thermodynamical law, which means that as the energy of the system mode increases, the energy of its heat bath mode decreases, and vice versa.

With a shift of perspective the 'heat bath' becomes the 'system' and vice versa. Heat bath and system together are a thermodynamically closed whole. *Some perspective must be taken*; it is not possible to get outside both, at least not without making traditional metaphysical assumptions that put subjectivity outside the thermodynamically closed physical system. Our system mode is labeled the 'non-tilde' (non∼) mode and the environment mode is labeled 'tilde' (∼).

These dual modes meet in the quantum vacuum state, the least energy state that they share. Their meeting is an interpenetration, a convolving, a 'superposition' in which the dual modes are entangled. The quantum thermofield theoretical vacuum state is *between-two* (Globus 2003, 2004, 2007). In Vitiello's (1995, 2001, 2004) formulation the system non∼ mode is specified to be the brain and the heat bath ∼mode specified as the brain's environment.[4] He calls the heat bath "the Double" and identifies the system with subjectivity. *Consciousness is identified with the state of their between-two.* The "roots" of consciousness

> seem to be grounded in the permanent "trade" of the brain (the subject) with the external world... (2001: 141)

> The unavoidable dialog with the Double is the continual, changeable and reciprocal (non-linear) interaction with the environment. If the consciousness phenomenon basically resides in such a permanent dialog, one of its characterizations seems to the relational (medial) one... Consciousness seems thus to be rooted and diffused in the large brain-environment world, in the dissipative brain dynamics. (2004: 327)

Conscious feelings, then, are grounded in the dynamical relationship between the dual modes, the between-two of the subjective brain system and objective environment.

Of course assigning subjectivity to the brain system puts aside a host of philosophical issues with which Vitiello (2001: 125) does not wish to deal: "Commenting on the consciousness literature or considering philosophical questions is outside the scope of this book." Vitiello's stance is typical of the practicing physicist's quotidian metaphysics.

In that the dual modes share the vacuum state, their relationship is a crucial variable. Under the usual "Hermitean assumption"[5] of quantum theory the dual modes must make a "match," in the sense that the complex number (a+bi) "matches" its complex conjugate (a–bi). The product of the dual modes' "belonging-together"[6] is accordingly a real number. (Recall that $(a+bi)(a-bi) = a^2 + b^2$, since the cross terms cancel and $i^2 = -1$.) In Vitiello's formulation *conscious feelings are the modes' belonging-together*. Conscious feelings are real states of the between-two in which the dual complex-valued modes belong-together. Phenomena appear in the match of the between-two. The world is consciously felt through the "trade" between the brain system and its world environment, the trading in which they optimize a belonging-together.

4. In the formulation by Globus (2003, 2004) the brain and its environment both are considered non$\sim$ mode and the $\sim$mode is an alter universe. (On the alter universe, see Umezawa 1993, sect. 2.6.) Vitiello has discussed the alter universe extensively (Alfinito, Manca & Vitiello 1997, 2000; Alfinito & Vitiello 2007), pointing out that its time arrow runs backwards to the past and its space is contracting, whereas for our universe time's arrow points to the future while its space expands. Vitiello oversimplifies the equations by assuming a point in time that is unique, where the universes are the same size.

5. For nonHermitean thermofield dynamics see Umezawa 1993, sec. 7.2.3.

6. The usage of "belonging-together" here is meant to echo with the *zusammengehören* of Heidegger's (1999) *das Ereignis*. See Globus (2003) for an elaboration of the connection between thermofield dynamics and Heidegger.

The dual mode vacuum state can be thought of as a peculiar type of mirror. In an ordinary mirror the 'tain of the mirror'[7] reflects a left-right reversed mirror image. The tain of a conjugate mirror in contrast reflects the incident signal back along the very line of incidence, thereby *reversing time*. (See the fine discussion by Lehar (2008).) Such a conjugate mirror remains under the descriptions of classical physics, whose equations do not distinguish time's arrow. However the tain of the quantum conjugate mirror makes time irreversible, in accordance with the second law of thermodynamics. This tain is anything but indelibly reflective; it supports *trace*, a total memory that increases at every moment coordinate with new symmetry-breakings. As Vitiello (2001) puts it, once you know something you are forever changed and can never go back to the way you were prior to that knowledge. The formative, rather than reflective, tain of the dual mode quantum conjugate mirror has the new degree of freedom introduced above: the between-two. The 'reflection' in this case is an explicate order *unfolded within* the tain – going from 'implicate' to 'explicate' order – rather than reflected from it.

So a quantum conjugate mirror is very different from the conjugate mirror of optical information processing, which is steeped in classical physics.[8] The tain of the thermofield conjugate mirror is between duals and the "reflection" is realized within the tain. Of course one should not expect some kind of quantum mirror to be commonsensical, and this thermofield conjugate mirror is peculiar. Rather than reflecting a reversed mirror-image or recovering the image (thereby reversing time), the state of the tain advances, continually updating its traces in Bogoliubov[9] transformation of theta-vacuum states. (This is a quantum thermofield version of what Whitehead (1929) calls "creative advance," and as mentioned above, the "consequent nature of God.") The tain of the thermofield mirror is remarkable: creative rather than reflective, through the belonging-together of the between-two.

Although Vitiello does not specifically discuss 'qualia,' he approves the Umezawa tradition's "consciously feels," which covers the same ground. (Again there is the avoidance of philosophical issues.)

> Incidentally, it is interesting that Stuart, Takahashi and Umezawa use the words "consciously feels." This may appear disappointing from a philosophical point of view since no further or independent "explanation" of these words is given.

7. For discussions of the tain of a Derridean mirror, see Globus (1992, 2003). "Tain" derives from the tin backing of early mirrors.

8. Lehar's (2008) formulation tries to accomplish getting the reflection within the tain, by having the incident signal and its time-reversed recovery reverberate back-and-forth. Here the incident and reflected signals do not belong-together but succeed one another. Succession is not *between* two but a rapid alternation.

9. In a notable synchronicity the name Bogo-liubov in Russian refers to God and love. Without the Bogoliubov transformation there could be no flux of conscious feelings.

> Nevertheless, this is exactly **what one does in physics**: physical processes *define by themselves* concepts otherwise outside of physical control. (2001: 113; bold added)

But physical processes could not define by themselves the case of consciously feeling. "What one does in physics" already assumes observation – some "one" to read the meter – a *meta-physical* assumption. Vitiello's physical processes do not define conscious feelings by themselves but already presume them. In any case, Vitiello's meaning of "consciousness" encompasses what philosophers mean by qualia.

Though it might be anticipated that the weirdness of quantum theory could find a place for a full-blooded panpsychism, working through the implications of thermofield brain dynamics does not do so. As we have seen, the implication is that conscious feelings, which encompass qualia, are restricted to domains whose minimal size is the coherence length. Sub-domains lack conscious feelings. The decisive point is that there is a size threshold in quantum field theory below which collective dynamics cannot emerge and so there can be no qualia there.

> [A] large composite system, consisting of many fundamental constituents of matter, exhibits a behavior at the macroscopic level that is totally different from properties of the individual constituents. (Umezawa 1993)

> This is essentially due to the action of ordered dynamics of collective modes emerging from interactions among the individual components. Once created, such ordered physical processes constitute a phenomenologically distinct mode, thus enabling us to treat them as distinct physical entities. (Jibu & Yasue 1995: 143)

Without condensation there can be nothing like mind or experience. This finding limits the reach of panpsychism. Below the threshold for collective dynamics there can be no conscious feelings. A full "descent into panpsychism" is thereby blocked; ψ does not go all the way down but halts at the domain structure. Ψ is the belonging-together of the between-two at the coherence length and above.

e. Trace, re-trace and belonging-together

The argument to this point remains consistent with a weak panpsychism. ψ only fails at less than the coherence length. But a further consideration has been introduced which sets a more specific restriction for ψ: the belonging-together of the between-two. A gas such as water vapor or an unmagnetized bar of iron particles do not have vacuum state cooperative dynamics above the coherence length. ψ requires cooperative dynamics. To grasp these considerations requires an inquiry into the theory of trace.

We consider a signal transduced at one of the brain's sensory receptors. After its energy is dissipated it falls into our mode of the dual mode vacuum state. There it breaks the symmetry and Goldstone bosons are created as macroscopic condensates in the domain structure to preserve the broken symmetry. Now it is a law of thermofield dynamics that when quanta are thus created in our non$\sim$ mode of the vacuum state, they must be annihilated in the alter $\sim$mode, and vice versa.

> One can show indeed that, in the vacuum state, the annihilation of the quantum A corresponds to the creation of the quantum $A^{\sim}$, and vice versa (Vitiello 1995). Then the excitation of the quantum A *from* the vacuum (its annihilation *in* the vacuum) corresponds to the creation of its "hole" in the vacuum, namely to the creation of the corresponding $A^{\sim}$ mode, which may indeed occur under the external replication signal. (Vitiello 2001: 113)

So the trace of the signal is paired: coherent Goldstone bosons in our mode paired with "holes" (treated as "quasi-particles") in the alter mode. When this signal is replicated and again falls into the vacuum, the boson trace is excited from our mode of the vacuum, annihilating it from our mode and necessarily creating a trace in the alter mode. The alter mode trace is thus a "re-trace,"[10] a trace of recognition. When the signal is again replicated, it belongs-together with the recognition trace and results in a real observable. *So the recording of trace and re-trace must precede observability.* Remarkably, both trace and re-trace are prior to Being in this theory, whereas usually we think Being is prior to any trace. (Again we are reminded of Whitehead's "consequent nature" of God: His consequent nature is trace.)

There are accordingly three steps which should be distinguished: (1) Quanta are created in our vacuum state mode and annihilated in the alter mode when input signals dissipate their energy and fall into the vacuum state. The Goldstone trace in our mode is paired with holes in the alter mode. (2) Replication signals dissipate their energy and fall into the vacuum state, which excites the non∼ mode, annihilating it from our mode, and creating quanta in the alter mode. The re-trace of recognition is in the alter mode, paired with holes in our mode. (3) Replication signals dissipate their energy and fall into the vacuum state where they belong-together with re-traces. This belonging-together of replication signal and re-trace is real, which Vitiello interprets as conscious feelings – consciousness of world – and Globus interprets as *Existenz*, which is world-thrown. Thus trace and re-trace are prior to consciousness of world, or alternatively, prior to thrownness amidst it.

Qualia, then, require more than domain structure and emergent symmetries. There must also be belonging-together in the ∼conjugate match of dual vacuum state modes. Different matches particularize the quale. In one match we see a green apple and in another match a red tomato because the sensory information falling into the vacuum state of the visual cortex belongs to different re-traces. What Vitiello thinks of as different "conscious feelings" or what Globus conceives as different world-thrownnesses are distinct dual mode matchings in different brain regions with different emergent symmetries, where incoming order (both sensory and brain-generated) belongs-together with ∼mode re-traces.

10. Surprisingly Derrida, in his 1981 book *Dissemination* (p. 257), develops a similar concept which he calls "re-marks," which are holes where "nothing takes place but the place." See the discussion in Globus (2003, sect. 3.6).

5. Discussion

The ontology of thermofield theory is founded in a dual mode plenum of symmetry. One of these modes is our mode and the other mode is an alter mode. (To stand outside both would return to traditional metaphysics.) The modes' relationship is "intrinsic" in Hegel's sense, in that the duals do not exist outside the relationship. Duality here is ontological. The duals are not some tweedle-dum tweedle-dee but are complex conjugate mirror images. For the quantum conjugate mirror, image and mirror-image are time reversed. Their belonging-together constitutes now. The now is between-two; in this the belonging-together bears fruit.

Without dual mode belonging-together there would be no-thing, no-Being, no disclosedness of world-thrownness, no experience, only mismatches of a dynamical abground (Heidegger's *der Abgrund*) in its originary springing-forth (*die Ursprung*). In the case of conjugate match between the dissipative brain's dual modes, this *Ursprung* withdraws as world-thrownness lights up in the between-two. The primitive dynamics must remain inaccessible – and so as products we always find ourselves already thrown, as Heidegger (1927, 1929, 1999) described in his existential phenomenology.

For nondissipative systems taken as quantum macroscopic objects manifesting cooperative dynamics, the dual modes must belong-together. The between-two 'is' and remains the same, so long as the object maintains integrity. There is Being without difference for such quantum macroscopic objects 'in themselves.' The diamond 'is' forever, at the minimal reach of panpsychism. For dissipative systems with the capacity for trace and re-trace, the belonging-togetherness of the between-two may change across the various emergent symmetries. The match is earned in encounter with the surround and so remains world-disclosure in flux.

Umezawa worked out the logic of the thermofield duality described above, called the "$\sim$conjugation rules." If the dual modes trade quanta, nothing changes. If a quantum were created in one mode a quantum would have to be annihilated in the other, so that the total number of quanta remains constant. Here the duality is quantum/hole. The thermofield theory of quanta-hole and hole-quanta dual mode pairs offer infinite possibilities for trace and re-trace and their belonging-together in the between-two, which discloses world as a brain state of dual mode match. There is no 'world' outside the brain; there are only macroscopic quantum objects for themselves, which are not world-like. World disclosure across subjectivities is not different takes on one world that is there transcendently. World is disclosed multiply.

This outcome is reminiscent of Leibniz, but where the role of God in His goodness is succeeded by a thermofield "holomovement" (Bohm 1980), it might even be said an unspeakable *nagual* (Castaneda 1972, 1974) whose dual mode match explicates "what is" in itself and in scattered cases variegated world-thrownnesses. This flowing match provides the concretions of Whitehead's "creative advance." In Whitehead's frame, traces are God's "consequent nature" and their constraint on belonging-together is God's "primordial nature." The view developed above is no idealism for there is a reality: a holomovement with dual modes whose belonging-together in the between-two discloses ("explicates") world-thrownness.

6. Conclusion

Consistent with quantum thermofield dynamics, any patterned matter with cooperative dynamics has characteristics of ψ that arise above the coherence length. However the belonging-together of the dual modes is near invariant in the case of ordinary world furnishings, whereas the between-two of the brain's water quasi-crystal has a continually changing match in waking and dreaming, due to the brain's immense capability for trace and re-trace, and so its infinite possibilities for dual mode matching. The ψ of the diamond is the same near-forever, vapors rising from the swamp have none, whereas our experiential states – based in thermofield dynamical necessity – incessantly flow. This result, which to our surprise halts the descent into panpsychism, may be less than panpsychist *aficionados* would want but offers far more than panpsychist scoffers imagine.

CHAPTER 4

Mind under matter

Sam Coleman

...ideas apparently clothed in particles of electric oxygenous fire
William Belcher

Panpsychism is an eminently sensible view of the world and its relation to mind. If God is a metaphysician, and regardless of the actual truth or falsity of panpsychism, it is certain that he regards the theory as an honest and elegant competitor on the field of ontologies. And if God didn't create a panpsychist world, then there's a fair chance that he wishes he had done so, or will do next time around. The difficulties panpsychism faces, then, are not metaphysical ones. They are, instead, difficulties of understanding, and of acceptance by philosophers.

The main difficulty of this sort the theory faces is that its ontology – with consciousness in some sense at the heart of all that exists[1] – is deemed too bizarre, frankly, too *humano-centric* to be taken seriously. Why should anyone think that consciousness, widely held to be the preserve only of ourselves, plus the most recently evolved organisms, infuses the basement level of all existence? Such a thought seems to many – especially, to scientifically scrupled philosophers of mind – a narcissistic (or at best hopelessly anti-realist) folly, which doesn't even deserve its day in court. Panpsychism appears, in this respect, on a par with the claim that the cosmos orbits the Earth; it seems to place the 'human element' too close to the centre of what exists – in Bernard Williams' (1978: 64) phrase – *anyway*.

In this paper I counteract the tendency to view panpsychism as unacceptably parochial. Panpsychism's proponents, far from being metaphysically short-sighted, and lazily reaching for what's nearest by – consciousness – in order to solve perplexing metaphysical puzzles, are those who have taken a most demanding philosophical step, which uniquely positions them to offer a coherent, elegant and wholeheartedly realist account of our world.

Contrary to first appearances, the explanatory trajectory pursued by panpsychists is not the 'top-down' one of taking something familiar to us, something local, and

1. A sense to be explained shortly. By 'all that exists' I mean 'all that concretely exists,' excluding abstract existents from the discussion as is customary in these matters.

trying to shoehorn it into basic ontology for the sake of a comfortable worldview. What we are doing is not, for example, akin to the mistake of conveniently assuming that *everywhere else* must be just like *around here*. Rather, the explanatory direction taken is *bottom-up*; the crucial question for any realist being: Given the world, richly-propertied and populated as we know that it is, what must this world be composed of at its lowest level to metaphysically account for the way that we know it to be?[2]

By explaining a new argument for panpsychism, I show that the theory answers the call of the deepest and most sober of metaphysical needs, reaching far beyond local human interests and contingencies.

1. Existing motivations for panpsychism

On the way to our central points, I will survey three important existing motivations that have led philosophers to panpsychism. The new argument to be presented here draws upon these motivations in various important ways, as will become clear. Moreover, with other extant reasons to be panpsychist already in view, it will be more easy to clearly distinguish and situate, as well as weigh, the new reasons to be offered here.

Roughly speaking, the exposition of the three extant motivations proceeds according to a decreasing element of humano-centricity in each.

1.1 The problem of consciousness

Perhaps the most obvious reason to endorse panpsychism is as a solution to the mind/body problem, or that aspect of the problem relating to phenomenal consciousness at any rate. Notoriously, contemporary conventional physicalism faces an *explanatory gap*[3] when it comes to accounting for the presence of consciousness. Such physicalism – still the orthodoxy in one or another form – claims that the experiential nature of the world metaphysically supervenes upon its non-experiential physical nature. The explanatory gap occurs because we seem – in principle, not merely con-

2. This question reveals the essential reductionism behind panpsychism, as well as most contemporary metaphysics of mind. The mission seems to be to deduce the nature of the world's tiniest components, given that the way it is with all else that exists is determined by their properties and arrangement. So, truly novel properties cannot arise at any 'higher level' of being. This doctrine, which I elsewhere call 'smallism' (Coleman 2006), is open to question, philosophically and empirically, and I have my doubts about it. Perhaps we live in an emergentist's world, for example; this remains to be seen. However, for the purposes of this paper I set these doubts aside. Those interested in the interface between philosophy of mind and the question of reductionism's truth can take my overall argument to be of the form: *if* smallism is true, then panpsychism is true, for the reasons given.

3. The term is Levine's – see his 1983 for example.

tingently – to be unable to make sense of the metaphysical entailment (for example: generation, constitution) of consciousness by non-conscious physical matter.

Conventional physicalism has even been thought by some to disappear entirely into this explanatory gap: there are famous arguments to the effect that without an epistemically transparent transition from the (non-experiential) physical to consciousness, we have reason to think it false that everything which exists supervenes upon the (non-experiential) physical.

Given this backdrop, the allure of panpsychism is clear. For example, Strawson (2006) has recently argued that brute emergence – the production of new properties in ways that are not epistemically transparent – is impossible. Sometimes phenomena at one level do produce entirely novel properties at a higher level, as when non-liquid molecules yield a liquid body by being bonded together in the right way. But it is always intelligible – it always makes metaphysical sense – how transitions like this occur, says Strawson. In the case of liquidity, we understand well enough how loose bonding between non-liquid H_2O molecules (say) allows these molecules to slide over and around one another, in a way that produces the characteristic liquid behavior we recognize of water at room temperature.

Certain other properties though, it seems, cannot emerge from a lower-level 'base' that utterly lacks them. Strawson challenges us, for example, to make metaphysical sense of the emergence of mass from the massless space-time points that some (philosophers think that some) physicists believe constitute matter's ultimate fabric. How could any amount of aggregation of items without mass be responsible for objects having mass, as we know that they do? The purported brute emergence of extension from these space-time points, which are supposed also to occupy no 'space,' offers another good case here. To have extended and massy macro-objects, it appears, their ultimate components must also be somewhat massy and extended.[4]

Some properties, then, must be basic: if they are to be possessed by large-scale things at all, they must be present all the way down, even in the *ultimates* – Strawson's term[5] for whatever turn out to be matter's tiniest building blocks. And consciousness is a property of this kind, argues Strawson; for its emergence from non-conscious underpinnings would be as (metaphysically) unintelligible as the emergence of mass and extension from the massless, extensionless space-time points of physical lore. Hence the problem of the explanatory gap for conventional physicalism. The ultimates that

4. Note here the clandestine adherence to smallism, the part/whole reductionism which I am not calling into question in this paper.

5. First coined in his 1999.

compose a conscious being, by virtue of which it is conscious,[6] then, must themselves be conscious.[7]

One further highly plausible assumption completes the argument for panpsychism here, the assumption I call *refundability*. If you happen not to like the ultimates composing your consciousness, you can always take them back and exchange them for others that you prefer: Allowing that physicists are correct about the ultimates (strings, on one view) being fairly homogenous entities, it seems then that *any* right-sized (and arranged) group of them could compose a sensate human being. After all, we're each constantly exchanging matter with the environment; in fact continuously refunding all of our ultimates. In which case, given that only conscious ultimates could compose a macro-consciousness like one of ours, all the ultimates must be conscious. This is panpsychism.

Still, if Strawson's were our only motivation for panpsychism, then we could perhaps understand the accusation that panpsychism is unacceptably humano-centric. It might seem extravagant, narcissistic, even explanatorily empty, to attempt to explain the production of consciousness as we know it by transposing it to the basement level of existence, and making it the property of every ultimate there is. Indeed, I have heard this maneuver described (somewhat melodramatically) as taking the tumor of the problem of consciousness and metastasizing it throughout the universe.[8] However, although I agree with the thought driving Strawson's argument[9] (in fact, I will later claim that the problem of consciousness as Strawson conceives it is but the most local manifestation of the deep metaphysical demand for panpsychism identified in this paper), his has by no means been our only motivation for panpsychism.

6. For an internalist, say, these might be the ultimates that compose the brain of the conscious being.

7. Why must it be the ultimates that are the first home of consciousness, why not something larger – carbon molecules, or brain cells say? As long as these were conscious, the panpsychist could have his story of macro-consciousness' non-brute emergence from its components, but at a (slightly) lower cost to credulity, one might think. The answer is that, were it items above the smallest level of existents that constituted the conscious bedrock, items themselves composed by the (now non-conscious) ultimates, the explanatory gap would just recur at this lower level: How could it be that non-conscious ultimates produced conscious molecules, or conscious brain cells? The puzzle of consciousness' emergence remains untouched here. So for panpsychism to operate at all, it must operate on the policy that it is the ultimates that are the fundamental loci of experience.

8. By an anonymous philosopher.

9. And behind the long distinguished tradition that thinks similarly. See Descartes (1641/1996) and Chalmers (1996) for a good snapshot of venerable and more recent related lines of thought.

1.2 Russell's Insight and the pull of parsimony

I take it that most extant forms of panpsychism have, broadly speaking, a Russellian heritage – deriving much of the structure of their ontology, if not also their philosophical motivation, from Russell's famous analysis of (micro)physics and consequent embracing of panpsychism.[10]

According to Russell, physical theory describes the occupants of its ontological catalogue – electrons, protons, photons, forces etc. – in exclusively extrinsic terms. Physics tells us what electrons, for example, are only by telling us how they interrelate with protons, forces and the like. Electrons are proton attractors, they are electron repulsors, they react to forces in such-and-such ways, have a mass of $9.10938188 \times 10^{-31}$ kilograms – which tells us about the kinds of displacements we can expect them to produce – the list continues. We are told about the nature of electrons, then, only in terms that relate them (largely via their doings) with other physical phenomena (similarly defined), and their eventual impact on our measuring instruments. And what of their intrinsic[11] natures? Physics is silent on this point. We know an awful lot about what electrons do, but nothing at all about what they are. Physical theory as a whole – the idea goes – sets out a formal structure of entities specified in extrinsic terms: via their relations with one another. What these entities are in themselves[12] is not a matter that physics busies itself with.

It follows, Russell observed,[13] that we don't know anything about the intrinsic nature of (micro)physical matter that could rule out its being intrinsically *mental*, in some sense. For we just don't know *anything* about its nature. All that we do know, on assumption of physicalism, is that the physical items whose intrinsic natures we have direct access to are intrinsically conscious – these are our own conscious experiences:

> [W]e know so little [of matter]: it is only its mathematical properties that we can discover. For the rest, our knowledge is negative...The physical world is only

10. Russell 1927a. Panpsychism is of course a very old view, with exponents including Thales, Spinoza, Leibniz and James (see Skrbina 2005 for exhaustive detail on past panpsychists). My point here is just to emphasise the Russellian influence over modern versions.

11. 'Intrinsic' is just one word often used to gesture at the non-relational nature of physical phenomena in this context. Others are 'essential,' 'categorical,' 'inner,' 'qualitative' and 'core,' and this does not exhaust the list of alternatives. There are difficulties with each term, (see Seager 2006 and Stoljar 2006, for example, for some of these) which I will not address here. I will allow myself to flit between those terms on the list that I feel get closest to *whatever we really mean*, something which I'm hopeful may be more clearly specifiable in future.

12. To the extent that this idea makes sense. We are assuming it true that relations need relata that have 'intrinsic' (but see n. 11 above) natures, that things can't be relational *all the way down*. Whatever that would mean.

13. Though he was far from the first; Eddington, Locke and (arguably) Descartes made much the same observation. See Strawson 2006 for more, especially on Descartes.

> known as regards certain abstract features of its space-time structure – features which, because of their abstractness, do not suffice to show whether the physical world is, or is not, different in intrinsic character from the world of mind. (1948: 240)

> [W]e know nothing about the intrinsic quality of physical events except when these are mental events that we directly experience. (1956: 153)

> [A]s regards the world in general, both physical and mental, everything that we know of its intrinsic character is derived from the mental side. (1927a: 402)

Hence, when considering the physical ultimates, it comes to seem a reasonable move to speculate that what constitutes their intrinsic nature is consciousness.[14] Physics describes their causal/relational roles, experiential natures provide the role-fillers, so to speak. This is panpsychism, but it is also physicalism. For physical descriptions of the ultimates can be taken to pick out the intrinsic, conscious items ('in themselves'). Such descriptions would in effect detail the causal/relational profiles of conscious natures, to be used as reference-fixers by physical referring terms. So in this sense the psychic constituents of physics' world would count as physical.[15]

Of course, if 'Russell's Insight' concerning physics is correct, then physical theory is precisely crying out for intrinsic *somethings* to serve as the doers of the doings that it records and relates. Panpsychism satisfies this need – the ultimate physical particles are to be thought of, in respect of their intrinsic natures, as loci of consciousness.

Hence, theoretical considerations of parsimony also count strongly in favor of Russellian (physicalist) panpsychism here: Granted that physics requires an intrinsic nature, and we have one conveniently to hand in the form of consciousness, simplic-

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14. Two points here: 1. We assume that there will be tiniest building blocks of matter, not an infinite continuum. Indeed there is some empirical hope of this; many physicists, additionally, work on the hypothesis that the ultimates are fundamentally homogenous. Heil (2003) finds the infinite continuum hypothesis practically incoherent, *a priori*. I have some sympathy with him, but place more weight on current scientific backing. (In any case, it's not clear that the infinite continuum hypothesis would be damaging to panpsychism. Panpsychists could envisage a level of existent *below which* all smaller components of matter had to be conscious, down to the infinitely small. This would avoid, as desired, any jump from non-conscious components to conscious composites, albeit with some sacrifice of elegance for the view) 2. Throughout, 'building blocks' need not be taken too literally: modern microphysical entities are just energy fields of greater and lesser concentration. Nonetheless, 'bigger' ones are 'composed' by 'smaller' ones, and these latter taken to systematically determine the properties of their 'composites.'

15. Also in another sense: On Stoljar's 'object conception' of the physical (Stoljar 2004), the physical is whatever lies at the root of the everyday objects of our acquaintance. This Kripke-style natural-kind view, if it found experiential natures underpinning the microphysical being of tables, rocks and such, would have no problem labelling such natures 'physical.' So, on either of these two plausible ways of specifying the sense of 'physical,' consciousness provides the physical world's (physical) bedrock in the panpsychist scenario entertained.

ity and elegance would prescribe slotting the phenomenal into the physical, yielding a microexperiential solution.[16]

As a motivation for panpsychism, Russell's Insight takes us a healthy distance away from the purely local preoccupations of the problem of consciousness, which after all concerned the difficulty of accommodating beings like us in the natural world. Now the focus is on what there is that can provide the required non-relational nature of the microphysical. However, while this focus might appear coldly theoretical, and – for panpsychists desirous of objective grounding for their view – pleasingly untouched by human concerns, this fact can just serve to make the accusations of parochialism against panpsychism even more vehement. For now, someone antecedently unsympathetic to panpsychism might say, we have been so heinously vain as to *drag* human consciousness along into an unconnected matter. At least consciousness as we know it is directly relevant to the *problem of consciousness*! But it could appear short-sighted in the extreme to suggest that phenomenal properties provide the intrinsic nature of the microphysical, *just* because the microphysical is on the look-out for an intrinsic nature, and because we can't be bothered to think any further than the ends of our minds.

To conclude that we have to turn to consciousness to provide the intrinsic being of the ultimates, we must have very good reason to think that there's nowhere else to go, the objection might continue. After all, why not search for an intrinsically physical (as in: conventional, non-consciously physical) inner nature for microphysics?[17] The third existing motivation for panpsychism to be examined addresses this question, and the challenge behind it.

16. Perhaps this is the place to say something about my conception of things and properties, since it matters for the way I put my argument, and is likely to confuse those not already steeped in it. I sometimes talk of consciousness as a property, or properties, and sometimes as a thing, or nature, or use other particular-talk. This mixture is intentional (or not unintentional), because I am dubious about the popular distinction between an object and its properties. I'm no bundle theorist, though neither do I think objects are anything in addition to their ways of being, strictly speaking. Now is not the forum for full explication of the view, but for our purposes it suffices to say that for me consciousness is in a sense both a property (of us, of ultimates) *and* a thing. The view of panpsychism to be pushed here is that the particulars that are the physical ultimates are intrinsically conscious natures. This means that they have experiential properties as their intrinsic properties, and that they are things in so far as they are loci of experiential nature. This nature comprises their objectual existence. Let me apologise here for any confusion that may issue from this way of talking in the paper; to the best of my knowledge this would not have its source in any confusion in me.

17. This is Stoljar's (2006) position for example.

1.3 Rosenberg's 'No alternative' view

Taking up Russell's Insight, Rosenberg (2004) develops it and drives it very deep indeed into the conventional physicalist worldview. He shows convincingly, it seems to me, that when it comes to the intrinsic natures we require for ontology,[18] the conventional physicalist account is – irredeemably – flat bankrupt.

Rosenberg offers a model of our world as composed of a system of nested circles. These circles correspond closely to the 'levels' distinguished in the 'leveled ontology' popular with reductionist physicalists (and others). So, we can think of physics as describing the biggest circle, with the chemical circle, biological circle, psychological circle, economic circle, social circle (and so on) represented, respectively, as ever-smaller circles nesting inside one another, all ultimately nested within the circle of physics.[19] Why ontological circles instead of levels? Rosenberg observes that the properties/things particular to each domain, each circle-system, rely on one another for their individuation, in a manner that ends up being circular. He illustrates with the following examples:

> In economics, what things count as goods and services?...Goods and services are those things that consumers and producers barter. Who are the consumers and producers? Consumers and producers, in their turn, are people occupying distinct positions in the system of bartering for the goods and services...In biology, organisms pass heritable characteristics through their genes. A heritable characteristic is one that parents pass from their generation to later generations. A parent, in turn, is an organism that passes along its genes...to the young. (2004: 235)

He then offers this general moral about all the circles nested inside the circle of physics (the 'levels' above the 'level' of physics, on the old layered scheme): "In each case, a closed...system of theoretical concepts exists...which are directly or indirectly circularly dependent on one another." (ibid.).

Thus far what we have is just an extension of Russell's Insight to all levels of the physical(ist's) world: Each level, each domain of scientific theory seems merely to describe a formally-related web of items: it individuates its denizens in terms of the

18. As in: 'what exists; existence.' Not: 'the theory of what exists.' We need the former to conduct the latter.

19. It's not clear that the social circle really nests inside the economic one. Perhaps they overlap, or have some other relation. Also, there will clearly be some pairs of circles that nest inside a third circle without nesting inside each other. I'm simplifying here for ease of explanation, and will ignore these and other subtleties, upon which nothing substantive hangs for us.

relations they stand in to one another,[20] but neglects to tell us anything about their intrinsic natures.

Next, Rosenberg adds an insight of his own. He distinguishes properties *intrinsic to* a system from properties *extrinsic within* that same system. The properties intrinsic to a system are those defined by the discourse of the particular theoretical realm in question, inter-defined by their relations to the other members of their conceptual circle-system. So, in his example of economics, the properties of being a good, or being a service, of being a consumer or producer are intrinsic to economics. A question then presents itself: if the inhabitants (the properties/things referred to) in a theoretical/conceptual circle have no grounding independently of one another, on what do they ontologically depend? The answer is that they depend upon items extrinsic within the circle-system they belong to. These items, in turn, are intrinsic to another, broader circle which encompasses the one presently considered. So the properties defined internally by economics ride on the ontological solidity of things like *desires* and *needs*, properties that do figure in economics, but which properly belong (that is: are individuated with respect) to the psychological circle within which the economic circle nests. These psychological properties are extrinsic within economics, but intrinsic to psychology. And they (along with the other psychological properties) in turn must depend, for their ontological solidity – that is, to avoid being, ultimately speaking, merely formal entities – on a circle within which the psychological circle nests. In this case, we might invoke certain biological properties (e.g. survival drives) as extrinsic within psychology, and thus as standing independent of its intra-definitional structure. But of course a similar story is true of the biological properties with respect to further properties that they, in turn, will have to 'ride upon' ontologically: these properties, extrinsic within biology, will have to come from a yet larger circle of being (most likely the chemical). And so on. Rosenberg claims that similar stories apply to the relations between each of the progressively larger circles, until at last we arrive at physics:

> Reflections on examples such as these lead one inevitably to concepts with wider and wider spheres of application. In the case of the natural sciences, this expanding arena of circularly looping systems traces the same path as intuitive expectations of reduction. When we look at a circular system of concepts, we find that its instances are carried by objects with properties extrinsic within that system but intrinsic to some other system. Inevitably, these other systems are themselves circular...and thus we find them carried by yet another set of objects with properties extrinsic within them. From economics, we look to social relations of a broader sort, then from those to psychology, ecology and biology, then to chemistry, and finally to physics. (p. 236)

20. Rosenberg allows that sometimes an item at one level depends not just on other interrelated items at its *own* level for individuation, but on items at other levels also. I omit this detail for ease, as it does not affect the larger point: that the *overall* theoretical structure provided by the physical sciences is circular (ultimately formal) – in the sense described.

His thought is that each 'higher level' domain requires entities from some other domain to get its "foothold on concreteness." This other domain will be a lower level, 'broader' circle of ontology whose entities in turn depend upon the inhabitants of some circle that it nests within. What Rosenberg has done, in effect, is to drain the intrinsicness of the physical world away, all down to the level of physics: Each level of discourse depends upon one(s) lower than it to implement the contrasts that its circular system of concepts expresses. In the end, all higher levels depend in this way upon physics. So then the question presses: 'What do the objects and properties of physics depend upon to implement *their* relations, to make *them* concrete?' But physics, as Russell observed, is a perfectly circular system for its own part. Rosenberg parses Russell's Insight thus:

> When we reach physics we find the same kind of circularity as in any other, less fundamental, sciences...we can easily see the circularity in physics by asking questions about the identity conditions on the basic physical entities. These...are broadly functional. What it is to be a photon, for instance, is to play the functional role in our environment that photons play in physics...as a result physics incorporates circularity, just as all functional systems do. (ibid.)

The result is that we search in vain for intrinsicness within the world as characterized by conventionally understood physical science. In so far as any entities have intrinsic being within this grand scheme, they have it only *relative* to a particular area (or areas) of discourse. From the standpoint of economics, social/psychological properties can be considered intrinsic – that is, ontologically self-sufficient (in some sense) – because they are the things that economic properties depend upon for their concreteness. But social/psychological properties are not intrinsic *tout court* in this scheme, for they in turn depend (at least, and ultimately) upon the properties of physics. But with physics itself (as conventionally understood) lacking proper mention of any *absolutely* intrinsic properties (its concepts also constitute a relativised circle), we must conclude with Rosenberg that the physical/scientific world, understood on its face, lacks any absolutely intrinsic properties.[21] Yet ontology clearly requires such properties. If there are to be relations – between the items referred to by each theoretical level/circle of reality – then there need to be relata. And if none of the relata of the conventionally understood physical world have intrinsic identity conditions (except with respect to other systems of entities that in their turn depend on yet other systems, and so on down to physics. And then...?) then we must search for reality's intrinsic building blocks outside of the physical as conventionally understood. Else we face an ontological house

21. It may pick out such intrinsic properties, by telling us about the formal relations they stand in to one another, but it is ultimately silent about their character. In this sense – on this understanding of 'the physical world' – it turns out that, since our world requires absolutely intrinsic natures for *anything* to have a 'toehold on concreteness,' these natures must be non-physical. This is the core of Rosenberg's anti-physicalism.

of cards; except, strictly speaking, without any cards really there to hold it up. We face nothingness.

Rosenberg concludes – taking his Russellianism to the natural next step – that, since phenomenal natures are alone in being absolutely intrinsic – they do not rely on any other entities for their individuation – we must look to them for the intrinsic nature of the microphysical ultimates. This provides the 'very good reason,' demanded above by the conventional physicalist, for our dragging consciousness into an apparently unrelated matter and deploying panpsychism. We simply have no alternative, says Rosenberg.

Still, some will not consider Rosenberg's a very good reason at all. True, they might allow, consciousness properties are absolutely intrinsic.[22] And true also, perhaps, the physical world has been shown – between Russell and Rosenberg – to be in need of an intrinsic nature to ground its ontology. Yet still, the conventionally-minded physicalist might maintain, it is the worst kind of philosophical laziness to halt our hunt for this intrinsic nature at consciousness. Instead of solving a metaphysical problem at an extravagant cost with panpsychism, we are better off keeping faith with conventional, *the-world's-nature-supervenes-on-its-non-experiential-physical-nature* physicalism, and holding out for a non-experiential physical heart for the ultimates.[23]

I think this response ignores the depth of Rosenberg's argument that the conventionally physical world could not harbor the intrinsic nature that we're looking for. But it has to be admitted that Rosenberg's argumentative strategy, as a device to persuade us of panpsychism's truth, suffers from being of the 'we've nowhere else to look, so it *must* be here, however crazy that sounds' variety. Sometimes when we're searching for something, and even when we have exhausted all available locations for it but one, still this one alternative can appear unacceptable, merely forced upon us. When I can't find my keys in any pocket, the car, the house, the office or in my wife's clothing, and all that's left is to consider the possibility that they might somehow be *inside the cat*, I may understandably balk at this suggestion, and take the view that my previous survey of sites is incomplete in some unobvious way. And similarly might the conventional physicalist reason, again citing humano-centricity as the real drive behind Rosenberg's lurch to panpsychism. '*Anything* but panpsychism!', we can imagine her saying. So we have not yet done enough to convince our opponent that we turn to panpsychism as a metaphysical solution on honest grounds of philosophical merit.

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22. At least some of them, which is all the panpsychist needs.

23. Again, this is how I read Stoljar's (2006) position, in the face of the challenge that physicalist panpsychism poses to conventional physicalism. Elsewhere (Coleman 2007) I argue that, quite apart from my argument of the next section that the properties required by basic ontology *must* be experiential ones, Stoljar's solution is anyway far less appealing than a panpsychist solution, on the grounds that panpsychism offers us a here-and-now metaphysical remedy to our problems, as opposed to a dogmatic, and possibly fruitless, wait in hope.

2. A new argument for panpsychism

My argument below runs differently from the considerations motivating Russell and Rosenberg. For I do not propose that we look to the experiential to found our world on account of not being able to find any other candidate intrinsic nature. Though I do agree that this is the way things stand, my argument has a positive turn: I try to present the force of the claim that the very idea of the absolutely intrinsic, absolutely qualitative being, *is* (the same as) the idea of the qualitative-experiential. That is why we should put consciousness at the heart of ontology, and embrace panexperientialism.

To repeat, I am not arguing that a process of elimination reveals consciousness to be our world's only intrinsically qualitative nature; so that given Russellianism about physics panpsychism wins *by default*. Instead, the argument here takes a positive form: the overall claim now to be defended is that *sufficient consideration of the notion of the intrinsically qualitative shows it to be indistinguishable from the notion of the qualitatively experiential.* The idea of that which has an absolutely intrinsic way of being *just is* the idea of the conscious-experiential, in other words. It is (primarily) in this warm-blooded sense that consciousness is the sole candidate to give the ultimates their heart.

I deploy three (roughly; they overlap) points in support of the claim that we should – must – look to consciousness to provide the intrinsic nature of the microphysical. Having stated and summarized these three points, I'll offer something of the form of a strict argument based upon them to finish.[24]

1. The leading thought is that the idea of the intrinsically qualitative just *is* the idea of the conscious. Thinking of something that is absolutely in itself qualitative (not merely qualitative *relative* to something else) is *ipso facto* to think of a phenomenal quality. Imaginatively bring to mind an experience of redness; and then, whatever the background, consider the sensation only in respect of its redness. It is clear that this phenomenal quality, so isolated in thought, is intrinsically qualitative; no one seriously doubts this, not even if they think (say) that the phenomenal is representational through-and-through.[25] But the converse is not typically held: that to focus on the notion of the absolutely qualitative is thereby to focus on some conscious quality. The thought here is not merely – not only – a challenge: to try to come up with an existence that has quality in its own right other than pure phenomenology, though

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24. Stoljar (2006) takes some panpsychists to argue that since we get our concept of the intrinsic from consciousness, it could only be consciousness that provided the intrinsic basis of the microphysical. He, quite fairly, rejects this conceptual link and the argument built upon it. My argument, however, make no use of the claim that our concept of the intrinsic derives from consciousness (although I happen to think that this might be true, for reasons the argument makes clear).

25. Though some at least claim to be able to doubt this. I think Jackson (2003), ironically, is now one of those. See note 37 below for more on this matter.

clearly this consideration has force too. The real force of the point, rather, is positive: to be some way – to have quality – intrinsically and in-and-of yourself is to be propertied in the kind of way that experience is propertied; it is to have a conscious quality, a phenomenal property. Further support for this thought derives from points 2 and 3 below.

> *Wait a second. Why can't I think that a nature like energy (or mass, or...) fits the bill? Perhaps Russell is correct, and we can only characterize energy indirectly, using equations and such; but in itself it is what it is – energy – even though the character of its intrinsic nature remains unknowable by us, in your sense. So why could we not say that (at least part of) the intrinsic nature of the ultimates is to have energy (or mass, or...)? And there's nothing remotely non-physical (as conventionally understood) about such an intrinsic nature.*

This is to get confused about the difference between the physical as conventionally understood and the physical as a panpsychist ontology would conceive of it. The concept ENERGY indeed very plausibly has to pick out some absolutely intrinsic nature, being a bedrock concept in physics. So there is no disagreement that, in this sense, energy fits the bill: saying of something that it has energy may well be to ascribe to it an intrinsic property.[26] However, the important question is what exactly *is* this absolutely intrinsic nature of energy? What inner qualitative nature does energy have? And so, what does it mean to say of an ultimate that its nature is energetic? As the objector notes, the equations – all that the armory of the conventionally physical provides – characterize energy's real nature only indirectly. The claim to be sustained here is that the intrinsic nature in fact picked out by ENERGY can only be a phenomenal nature, because the absolutely intrinsically qualitied just is the experiential. To say that something has energy, read as an intrinsic property, will be to ascribe to it a phenomenal property. I understand the interruption, but the overall idea here will hang together more cohesively and persuasively if objections can be saved (I don't suppose they can) until after the statement of supporting points two and three, which flesh out – give more muscle to – the sense of the first point.

2. To say that something is qualitative is to say that there is an answer to the question: 'What is it like?', even when – as is notoriously the case with consciousness-properties – this answer escapes much elucidation in terms of words. But what we require in the case of the intrinsic qualitative nature of the microphysical ultimates is *absolute* what-it-is-likeness; for what we, along with Rosenberg and Russell, are seeking is a core, inviolable, intrinsically qualitative nature upon which to found all ontology. The building-blocks of all existence must be *absolutely* qualitative; they must be some way in and of themselves, and relative to no other standard. For if they don't (as it were)

26. I'm dubious that ascribing mass to something is to ascribe an intrinsic property, however, for reasons I'll not go into here. Anyhow, if MASS *is* taken to refer to an intrinsic nature, similar remarks to those made here regarding energy will mean that this too must be a phenomenal nature.

stand on their own two feet ontologically-speaking, they cannot be expected to play the role that metaphysics assigns them: to provide the essential substance that fills the causal/interactive profiles set out by microphysics. Put simply: Were it the case that the ultimates weren't qualitative in an absolute sense – intrinsically and in and of themselves – then nothing at all could exist. There could be no physical world of substance for the microphysical existents to hold up, were they not themselves absolutely substantial; which means: qualitative in their own right.[27] They must owe the way that they are, their qualitative nature, to nothing else but their own being, given that they exist. I'm labouring the point, but that's the only way I can see to communicate this most key of intuitions: to put it in various ways so that one of the reader's tastings of it will prove decisive.

If this is correct, then what we require in our search are natures that are absolutely qualitative; which means, absolute answers to the question 'What is it like?', when considering each individual ultimate. It is no idle co-incidence that this phrase – 'What is it like?' – is intimately associated with Nagel's (1974) famous and incredibly influential attempt to home-in on the nature of phenomenal consciousness in *What Is It Like to Be a Bat?* According to Nagel, asking, of a conscious creature, 'What is it like to be that creature?, What is it like *for* the creature?' is our best way of drawing attention to the qualitative, conscious-experiential properties we take that creature to enjoy; properties that we are so very well acquainted with in our own cases, and which a stone does not have.[28] Since *What Is It Like to Be a Bat?*, it has been common practice, more like second nature, for philosophers introducing the topic of the problem of consciousness to call upon Nagel's phrase to evoke phenomenal consciousness to their readers. What-it-is-likeness and phenomenal consciousness have become, in many philosophical circles,

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27. Further to note 16, on my view of the overlap between qualitative natures and things: I mean 'substance' and 'substantial' here quite literally, since I regard the intrinsically qualitative ultimates as the paradigm substances – in virtue of the fact, and to the extent that they are absolutely qualitative – from which anything else with a genuine claim to substance-hood must be built. However, if the reader prefers, she need only understand here that the ultimates must have absolutely qualitative natures to be metaphysically 'solid' enough to take on their job as the supervenience-base of all that exists. This is my version of Rosenberg's claim that absolutely intrinsic natures are needed to give existents their 'foothold on concreteness.' (My idea of substance owes much to Strawson 2006)

28. *But since this is panpsychism, surely the stone does have conscious-experiential properties, isn't that the point?* Actually panpsychists needn't take inanimate objects composed of conscious ultimates to themselves have conscious experience as the wholes that they are. So while the stone has conscious-experiential properties in the sense of comprising ultimates that have these properties, the stone, *qua* stone, does not have such properties. My view, in brief, is that it takes a special composition of ultimates (roughly, a brain) to create a macro-consciousness, by pooling together the micro-conscious natures composing it. For a bit more on this idea see Coleman 2006, and for much more see Coleman forthcoming. In any case all I'm calling attention to here is our pre-theoretical sense of the inertness of things like stones, when compared with things like us, so it's not the place to cut me with my own conclusion.

synonymous. And for good reason: absolute – intrinsic, in-its-own right[29] – what-it-is-likeness just *is* phenomenal consciousness, for the essence of the latter is intrinsic qualitativeness. The idea of something being a certain qualitative way with respect to absolutely nothing but itself just *is* the idea of the experientially qualitative; think of the smell of pine leaves, the cold of the wind, the color of blood, a stab of that fear when you think you've forgotten to lock your front door... It follows that if the ultimates must be absolutely some way, if there must be absolute what-it-is-likeness at the heart of ontology, then this deep-down nature can only[30] be consciousness.

> *There's an important equivocation here, that you can't get away with: There's Nagel's sense of 'what it is like' when describing the conscious state of a being, yes. And there's also the sense of 'what it is like' that we employ when talking about things that we take not to be conscious, as in 'What is the ice rink like? Is it terribly slippery?' The 'what it is like' locution is used in two different senses in these two contexts however; the first sense is consciousness-involving, but the second is not. And since it is the second kind of context in which we would ask, of an ultimate, 'What is it like?', there's no way that Nagel's sense of 'what it is like' can just be plugged in here so uncritically, so as to yield your desired result that the question of what an ultimate is like can receive the same answer as the question of what an experience is like: i.e., phenomenally qualitied.*

I might respond that this objection is question-begging, since it assumes what I deny, that the consciousness-involving sense of 'what it is like' is distinct from the (apparently) not consciousness-involving sense. And I might add that offering a univocal interpretation of the phrase 'what it is like' counts in my favor here. But that would not be to the point, at least not discursively. For I do have some burden to make attractive the equation between Nagel's use of the key phrase and our use of it in everyday, and subatomic(!), contexts:

It is certainly good enough for the naive realism of common sense to consider that when we talk of the properties of (supposedly not consciousness-involving) objects we perceive, of what it is that they are like, we literally ascribe to them properties which many philosophers think of, instead, as being confined to phenomenal experience. When we say that the apple is red, for example, we (in the naive mode) think we are literally ascribing phenomenal red to the surface of the apple, making mental paint[31] like real paint. Centuries of philosophy and science are supposed to have taught us that this cannot be literally true. Even if we maintain that colour is a real property of surfaces, it is for several reasons hard to make sense of the claim that the property I experience is (also?) a property of the apple itself, that would persist even were I not to. Yet this is certainly the way that the unreflective mind conceives of the situation.

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29. More fumbling. See n. 11.

30. In the positive sense earlier explained.

31. I owe this phrase to Block 2003.

If we accept the old thought that phenomenal redness is not really – in some sense – a property of the apple itself, then we should be prepared to try to answer the question of what the apple is *really* like. If it is not phenomenally red, if it is only my experiences that are phenomenally red (in some sense), then how truly *is* the apple?[32] Berkeley could make no sense of this question, which is why he denied the existence of extra-mental properties and things, and endorsed something close to panpsychism. But Berkeley's move just represents a forerunner of Rosenberg's thought that we cannot, search as we might, find any intrinsic natures for existents outside of intrinsically qualitative phenomenal properties. I am arguing for the converse claim, that the notion of the qualitatively phenomenal positively equates to, and exhausts, the notion of absolutely intrinsic nature. So I'm not satisfied by the thought that we just can't reach beyond our experiences when searching out intrinsically qualitative natures for things. I *am* satisfied, however, with the observation that it unreflectively makes sense to us that the same properties that (we are told) belong to experience are literally properties of the objects of experience, so that the questions of what an experience is like, and what the object of that experience is like, could have the same answer. What fails to tally in this analysis is the notion that the properties of my experience are *numerically* the same properties as those had by the object I experience. The truth that I could be done away with without that object and *its* properties being done away with does away with this notion. But what doesn't obviously fail to tally is the notion that the properties of the object might be *qualitatively* the same as the properties of my experience. The problem is not so much with the claim that the apple might be the same color as phenomenal red; the problem is with the claim that it might have the very same token property that figures in *my* experience (and yours, and hers, and...). Thinking straightforwardly then, when we consider, of an object, what it is like, one way or another we naturally turn to phenomenal qualities to answer this question. Thinking of what an object is like, in non-relational terms, reduces to Nagel's sense of 'what it is like.' And this sense is consciousness-involving.

It will have occurred to some reading the previous paragraph, where we seemed to lurch into an indirect realist view of perception, that what is needed here is a good dose of *philosophically informed* naive realism, otherwise known as 'direct realism.' Direct realists would deny that there are qualitative properties literally *of* experience. Instead, experience is held to be transparent, in Moore's sense. This means that the intrinsically qualitative properties we apparently apprehend in experience are really just properties of the extra-mental objects we perceive. Rather than having qualitative phenomenal properties of its own, experience is merely transparently full of the qualitative properties objects before us have. On this view, the equation I'm making between experiential what-it-is-likeness and the what-it-is-likeness of objects and ultimates might seem to go to pieces. For if there are not, strictly speaking, phenomenal

32. See Stroud (2000) for an excellent discussion of the intricacies and difficulties of these issues.

properties of experience, then we cannot make use of properties like these to answer the question of what objects and ultimates are like. We cannot export phenomenal properties into the world to provide its fundamental intrinsic nature, because there are no such phenomenal properties in the first place.

I have my doubts that direct realism so understood is even a coherent doctrine, but I leave these for another place.[33] The relevant point to make here is that, contrary to appearances, this doctrine cannot undermine our conceptual equation of experiential what-it-is-like properties with worldly what-it-is-like properties. For direct realism as characterized in fact makes just the same equation as the 'naive indirect realism'[34] we arrived at, only starting from the other direction. Indeed, thus rendered, the claim that what objects (and ultimates) are like is like what experience is like is made even harder to turn away from. Let me explain:

Direct realism says that my experience does not contain qualitative properties that I could graft on to extra-mental objects. Rather, the objects have qualities, and my experience is transparently full of these. Things run something along the lines of this analogy, I think: Looking out of a normal window at a brightly colored scene, let it be a brightly sunlit autumn tree, vivid oranges and reds, we might be tempted – for example if the scene doesn't noticeably alter when we move our heads – to think that the window itself has the color properties we immediately experience; that it is a highly realistic, photographic-quality stained-glass window, say. But of course in the scenario considered the window does not have these properties; any color properties present are properly taken to be possessed by things other than the window: objects perceived through it, or the light, or some combination of these. The window itself has no 'qualitative properties' (at least not of this kind).[35] Rather, it is simply transparent to such

33. See Coates (2007), which ably articulates several serious concerns that I share about the view.

34. It might be objected that indirect realism is hardly a 'naive' view of perception, i.e. one held by the folk. I'd be inclined to disagree, based on contact with philosophy students starting on the topic. More broadly, the question of what the folk view of perception precisely (or imprecisely) is is obviously up for debate. But none of this matters terribly: my point in this section of argument is really that, so long as you're a realist about phenomenal character, it won't matter where you locate it in the mechanics of perception, still we'll be able to equate experiential what-it-is-likeness with worldly what-it-is-likeness.

35. We'd better forget about its transparency, for the sake of the analogy. When direct realists say that experience is transparent, this reveals, they cannot literally mean it. For a window is transparent on account of intrinsic properties of it, such as the nature and arrangement of its tiny parts (though note that these are not *absolutely* intrinsic properties of the window, even if the natures of its ultimates, as I'm claiming, are absolutely intrinsic properties of them). If transparency, phenomenal transparency, were similarly allowed to be an intrinsic quality of experience then direct realists would be contradicting their avowed view that experience has no such qualities. The direct realist view, it therefore appears, secretly tends more towards the opinion that experience, as such, does not exist. It is in that sense, perhaps, that one can 'see through

properties, in some sense informed and infused by them. It is supposed, I think, to be this way with experience and its relation to the properties of what is perceived, on direct realism.

But clearly no substantive difference has been made here to the issue of whether or not we can legitimately take the what-it-is-like of experience to be (qualitatively) the same as the what-it-is-like of the world. For now it is not experiential properties that are painted onto the world, but the world's qualitative properties that go into making up the what-it-is-like of experience. The new direction is not mind-to-world, but world-to-mind. But it remains just as true to say that the experiential what-it-is-like and the worldly what-it-is-like can be considered of the same kind. For all there is to the qualitative nature of our experiences, on direct realism, are the properties that the objects of experience are perceived as having. In fact, direct realism, I think, helps me to make *more* sense of my claim that the significance of 'what-it-is-likeness' when talking about the world is the same as Nagel's experiential use of the phrase. For on direct realism, the properties we mistakenly think that experience has are really the properties of objects. So there can be little resistance to the claim that what the objects of experience are like, is just like what experience seems to be like. This is what's entailed by saying that experience is transparent, after all.[36]

From this discussion I conclude that when we ask what things are like, meaning to refer to their non-relational, qualitative nature, we routinely – almost, it seems, unavoidably – bring in phenomenal, or phenomenal-based properties to do this. Our default sense of the way it is with the world qualitatively is a way that populates it with the kinds of properties we seem to find in experience. This is not surprising, because we have nowhere to turn when we think about what the world is like qualitatively other than to the way it presents itself to us in our conscious experience of it. There is nothing immediately incoherent in the notion that the way it is with experience could be qualitatively the same as the way it is with the world, even when we impute the 'real' properties that exist to the world and have our experience merely saturated by these.[37]

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it' directly to the world. But I take this eliminativist position to be a non-starter, and in any case it is far from implied when direct realists say, as they do, that 'experience is transparent.'

36. Elsewhere I use this equation as the basis of a new, panpsychist, theory of perception and intentionality (Coleman forthcoming). Notice, again, that on direct realism as I describe it here, experience doesn't *disappear* entirely from view. To say that experience is transparent to the qualities of objects is to imply that there is such a thing as experience. I think direct realists sometimes want to deny that there is such a thing as experience. Their deep-down intuition seems to be that there is 'just' the world and ourselves involved in perception; whatever this would quite mean. But direct realism, whatever its proponents wish for, does not imply that experience doesn't exist; it implies that it does. So, since experience exists (can anyone have seriously got into a situation of doubting this?), we are in a position to make the equation between its what-it-is-likeness and that of the world, as explained.

37. Have I neglected to discuss the option of intentionalism, on which 'phenomenal properties' are just intensional properties of experience, which merely 'represent that' phenomenal-like

Look at the way we talk: 'What is an apple Jolly Rancher like?' 'Well, it smells appley, and is bright green, hard to the touch, sweet...'

I must be careful to be quite clear about what I am claiming here. Though I'm tempted to the view, I'm not claiming that the perceivable properties of large scale objects are literally phenomenal properties; that phenomenal redness is out there in the world painted on ripe tomatoes and stop signs and such. The immediate point I am making, instead, is conceptual. It is that when we think about what some thing is like in itself, its qualitative way of being, we naturally, inevitably, invoke phenomenal or phenomenal-based properties in order to do this. The notion of the intrinsic qualitative way of being for some existent coincides with the notion of the quality of phenomenal experience.

When we come to wonder what the needed absolutely intrinsic qualitative nature of the ultimates is, then, all that would satisfy us would be an answer closely enough related to the phenomenally qualitied properties of experience; which means, at a minimum, an answer that mentioned consciousness properties. And here let me say that I do intend a strictly metaphysical result; to put consciousness properties literally into the world (at the level of the ultimates). The absolute what-it-is-likeness we seek for the ultimates, therefore, is positively conceptually bound to be the what-it-is-likeness of Nagel: phenomenal-experiential what-it-is-likeness. This is consciousness.

Philosophers are dubious, to say the least, when our conceptual constraints seem to become projected into the world, apparently determining how things can be metaphysically. And yet, if we are getting our picture of the world more or less right (if we aren't on the wrong track just from the outset of our inquiry) then we can expect the conceptual structures we find ourselves with to find their genesis, their form, and so their mirror, in the world that, after all, gave rise to them. Carefully articulating these structures, we can hope to bridge the intolerable gap between world and mind that is forced upon us by the philosophical *status quo*. (This is, it might be, to employ transcendental reasoning in reverse)

3. Another approach to triangulating the notion of the absolutely qualitative is to think of it as having an *essentially exclusive* nature. Let us unpack this. If something is absolutely qualitative – meaning that it instantiates some particular quality in and

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properties are instantiated in the environment? I take it that the point made about the equation of phenomenal what-it-is-likeness with worldly what-it-is-likeness is not touched by intentionalism, given that it acknowledges a what-it-is-likeness of experience. There must still be intrinsic, instantiated properties of experience in virtue of which it is like what it is like. The real threat from this quarter might come if intentionalists could 'eliminate' phenomenal properties proper, by reducing phenomenal experience to intentional representation of a naturalised sort. But I don't believe the latter is possible (see Chalmers 2004 for example for reasons why), although I do concede all that an intentionalist should care to claim: that the phenomenal properties we experience are ineliminably representational. It doesn't seem to me that this need imply that the phenomenal properties of the ultimates are representational also, which would be an unwelcome result (though not for Strawson, interestingly, as it appears from conversation).

of itself – then this nature excludes any other absolute quality from occupying its location. What it means to say that some patch of reality (absolutely) has *this* quality, is that any second, any different, absolute quality is not instantiated there. Repetition: to say that an item is a certain absolute way qualitatively-speaking is implicitly to mark the fact that it is not (and, is not also) any other absolute way qualitatively-speaking, where the first qualitative nature inheres. A confusion threatens to obscure this clear point however:

> *Surely, of a green spherical object, it is correct to say that the qualities* greenness *and* being spherical *are instantiated together in the same portion of reality? And being green and being spherical are clearly different absolute qualities. So it's mistaken to think that the nature of the qualitative is at core to be exclusive of other ways of being. Clearly, distinct absolute qualities can co-exist in the same location.*

My response is that the green ball is *not* green and spherical in the same location. You never really have greenness and spherical-ness overlapping each other. It is true to say that the surface of the ball is green (has a microstructure that reflects light such that we experience it as green, say), and it is correct to say that the shape of the ball is spherical; the ball's matter is shaped into a sphere. But it is not correct to say that the ball's green surface is also spherical. Nor is it correct to say that the ball's spherical shape is also green. The properties do not in fact collide. They merely *meet*, across the en-propertied, whole material nature of the ball.[38]

In a certain sense of 'space' that I want to employ, related to its use in space-talk in mathematics, or to the sense that figures in 'the space of possibilities,' the ball's qualities of being green and being spherical do not even exist in the same space, let alone at the same location. We could also helpfully talk of 'dimensions of being,' 'property dimensions'[39] or 'metaphysical spaces' here, perhaps. Being green and being spherical are not even properties of the same sort; they exist in different spaces, different property-dimensions, and so cannot collide. To have a chance of existing in the same precise 'location' (again, this spatial talk is not to be taken too literally) at once, which

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38. I'm setting aside, for discussion of this case, the Rosenberg thought that the greenness (so described) and shape of the ball are not really absolute qualities. The property of being green here is really just a disposition to cause experiences of a certain kind in beings like us, a quality whose ontological credentials lean on the reactions of perceivers. And the ball's being spherical is a quality really implemented by the relations between the ball's ultimates. That is to say it may be an intrinsic property of the ball, relative to the ball's circle of being, but it is not an intrinsic property in the absolute sense. It is not surprising that the objector here has to create examples of apparent property clashes – of absolute qualities inhering in the same location – from non-phenomenal resources: phenomenal properties being the only absolute ones, such clashes between them are impossible, and consequently the only kinds of properties that might occupy the same location (both apparently and really) are (pairs of) non-phenomenal, and thus non-absolute, ones.

39. Thanks to Brendan Larvor for this simple way of putting things.

is what would constitute the clash I claim to be impossible, two qualities must at least inhabit the same space, in my sense, first.

With this clarification and terminology in place, it is clearly true that distinct qualitative properties, really absolute ways of being, cannot occupy the same location. If some thing is in some respect *this* way, then it cannot also, in that respect of itself, in that dimension or 'space' and at the same location – be *that other* way. Absolute qualities, where they inhere, are one way and one way only. This is not at all to say that *objects* cannot have several different absolute qualities of different kinds at once. In the sense of 'space' at issue here, these properties are instantiated in different spaces of the same object.

I take these thoughts to reinforce the claim that it is in the nature of the absolutely qualitative to be exclusive of other absolutely qualitative natures, in the location (in the space) where the first nature is instantiated. The layers peeled back, this is perilously close to a tautology, but one of those deep, useful ones that it is hard – and worthwhile – to get a satisfactory grip on.

And when we now turn to think about what it means to be intrinsically, absolutely qualitative, in this sense of excluding other intrinsically qualitative natures, and about which positive class of properties might exhibit this characteristic, I submit that we can look no further than to phenomenal properties. The most immediately striking case, perhaps, is color: Consider a patch of (phenomenal) red. In grasping that this patch is red, we understand that it is qualitatively red *and not any other way*, in terms of color (in the color 'space'). The redness of the patch precisely precludes that any of the patch's extension is also green, or blue, or whatever else (but red). If you like, rather than focusing on the positive aspect of absolute quality – as we did above when considering quality as what-it-is-likeness – here we elicit its negative aspect: It goes with being absolutely some way, with the answer to 'What is it like?' being 'Absolutely like *this*,' that any other way of being is excluded, that any other (absolute) answer to the question 'What is it like?' is metaphysically counted out at that location.[40] And again, we see that phenomenal qualities positively fit the bill of specifications for the absolutely qualitative. More confusions threaten to cloud things though:

> *I see. This distinction between particular determinate properties in their 'locations' and kinds or 'spaces' of properties helps somewhat. But there are still problems on the phenomenal property side of things. What about a phenomenally 'stripey' patch of red and green? And what about a patch of pure phenomenal red that then becomes tinged with another color before our (mind's) eyes, as happens when we experience red paint being mixed with drops of blue to give purple, for example? Aren't these cases where there is more than one phenomenal quality in precisely the same location*

40. Given that properties can stand in relations, then two properties – an intrinsic one and a relational one – could co-exist 'in' the same metaphysical location. For example, of an absolutely red area, we might say that it is *brighter than* another, dimmer, absolutely red area. In that sense, then, the first red area instantiates two properties, in the same property-space, simultaneously. But the important point is that an absolute quality excludes any other absolute quality.

> *of the same space? If so then it is far from clear, even if you're right that to be absolutely qualitative is to be exclusive of other absolute ways of being (in the location where one is instantiated), that phenomenal qualities are cut out for the job, let alone* alone *cut out for it. Phenomenal properties do not really seem to be exclusive of other natures in the manner required.*

There are no good objections here. The case of stripes is not one of multiple phenomenal qualities in one location (in the same space), rather it is a case of considering multiple (stripes of...) locations. Of each of the qualitative areas – each stripe of red or of green – it is clearly true that what it means for it to be a stripe *of red* or a stripe *of green*, is precisely that it does not feature the other color (nor any third), else it would not be what it actually is. And the case where red is steadily tinged blue (eventually giving way to purple), though more tempting, doesn't get anywhere either. For it is never the case that multiple *phenomenal* qualities are instantiated in the same location. Whatever mixture of red and blue paint there is before the eyes, the quality before the mind's eyes is determinately *that way* at each instant, to the exclusion of all other ways. That, after all, is how the patch of red turns from being red to becoming purple: at each moment it exhibits a certain phenomenal quality that *ceases to be* once a noticeable further amount of blue is added. And if a noticeable further amount of blue is not added, then, clearly, the patch remains the same (phenomenal) color that it was, to the exclusion of the past and future shades that have occupied or will occupy that patch. We should not get confused here between the mixing of different color paints, and the 'mixture' of different colors of phenomenal paint. The latter is strictly impossible: whatever phenomenal quality inheres in an area, *that* is the way the area is. (But this is not to say that two phenomenal qualities cannot *blend* to produce a new one:[41] the flavors of beef and of red wine can (pleasingly) interpenetrate. It is just that the result is not to be thought of as a *mixture* of phenomenal qualities, where each quality remains intact after the mixing. Rather what happens here is a *phenomenal reaction* (after: chemical reaction). Two qualities may blend with one other to produce a third, new, quality that indeed bears hints of where it came from. If it didn't bear these hints, then this wouldn't be a case of phenomenal blending at all.[42] But the third quality is

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41. Indeed this is a key idea in understanding the panpsychist procedure for mind-composition that I propose, as explained in Coleman forthcoming.

42. This story might seem to beg a nasty question: On pain of there being only one phenomenal property experienced by a person at any time – the blended mass of all their sensations – how are we to know when phenomenal qualities have blended together into new ones, or when they instead stand distinct from their phenomenal fellows, in a phenomenal multitude rather than a mass? How are we to individuate phenomenal qualities, in other words? But this is not really a problem. The ideas of phenomenal blending and of phenomenal distinctness clearly make sense, and refer to phenomena we're all well acquainted with; experiencers will know what I'm talking about here. (Others presumably won't be reading this) And of course we want to say that subjects experience many qualities at once, alongside saying that some qualities blend together into others. As for the discriminatory rules here, they are going to be nothing other than itself, as matters for this account, entirely phenomenally determinate and unitary. This is the case too with the blend of phenomenal blue and phenomenal red that produced phenomenal purple, considered just now.)

The idea of being absolutely qualitative, then, involves the idea of excluding distinct qualitative natures from one's location. And we need not (and cannot) look any further to find properties that do this than to phenomenal properties. For it is in the nature of consciousness to exclude all else from it.[43] This remark sounds cryptic. What I mean is that any element of consciousness is determinate at any instant – there is a determinate what-it-is-likeness for the experiencer[44] in respect of this phenomenal element, even if that determinacy is just *being determinately vague*, e.g. not-quite-red-nor-orange – and what it means for it to be so determinate is that the conscious element, of its own force, excludes any second qualitative element from its location.

To summarize these three points, then, and to capture something of the way in which they interconnect: To be intrinsically, absolutely qualitative is to offer an absolute answer to the question 'What is it like?', it is for the what-it-is-likeness of a portion of reality to reside in the nature of that portion alone, independently[45] of its co-existents. It is also for that portion of reality to exclude any other (absolute) qualitative

phenomenal rules (what else could they be?): when qualities *feel* to be blended (as with the beef and wine), then they are. And if the phenomenology reveals distinct qualities, distinct aligned phenomenal determinates, why then, that's what we have. People are reluctant to let the phenomenal answer to phenomenal modes of inquiry, as if this practice threw the objective reality of the phenomenal into question. But, short of the knowledge argument being falsified by a real-life Mary (*per impossibile*, for the purposes of this paper), it is hard to see what other means we have. A deeper point is that if one already holds the phenomenal to be objective and real, then it can do no harm to use phenomenal means to investigate it. The worry must be that the case of phenomenal realists then looks more shaky – less *scientific*, whatever that's supposed to mean – to the dubious than if there were good third-personal handles on the phenomenal phenomena. But for some time I've considered this conversation with (what are in effect) eliminativists to be wasted breath. It is better to start off by being soberly, eyes-open realist about what existents we find, and what the differences are between them, and to sort the mess out later.

43. Thanks to Frederik Willemarck for this phrase, and for discussion of this point and many others.

44. Where there is one. My variety of panpsychism is committed to the notion of some unexperienced phenomenal qualities; those possessed by the ultimates. This is in direct contrast with Strawson's version. See Coleman 2006 and the author's reply to commentators in Strawson 2006 for more on this tricky issue between panpsychists, as well as Rosenberg 2004. The lack of an experiencer to witness a phenomenal quality does nothing in my view to affect the absolute determinateness, and so exclusive tendency, of that quality.

45. The right sense of 'independently' here is famously difficult to pin down. We certainly don't mean *metaphysical* independence, since a tokening of absolute quality may depend on something else for its instantiation (like the interaction of prior qualitative instances). *Conceptual* dependence is somewhere nearer the mark: making sense of the quality of a patch of absolute what-it-is-likeness requires consideration of nothing other than the quality in question. But

nature from its region of existence. These are not separate 'functions' of absolute qualitativity, not even separate aspects; rather what it means to be absolutely some way qualitatively-speaking, what it means to be absolutely *like this*, is that a unique way of being is instantiated, necessarily to the exclusion of all others. To say that these are flip sides of the same coin would be to put too much distance between them.

Given that these – absolute what-it-is-likeness, and exclusion of other natures – are (at least some of) the characteristics of the absolutely qualitative, I suggest that our notion of the absolutely qualitative *just is* our notion of the qualitative-experiential. It is not (only) that we cannot think of any properties with absolutely qualitative natures other than phenomenal properties. It is rather – to return to point one above – simply that in entertaining the idea of the absolutely qualitative, absolute what-it-is-likeness and exclusion of other qualities, we *positively* entertain the idea of the qualitative-experiential. The two ideas converge and merge in one. It is difficult to know how else to recommend this insight to the reader other than to ask him or her to think hard about it.

I conclude that the requirement by the microphysical world of an absolutely intrinsic, absolutely qualitative nature – in order that there might be anything at all to this world and everything it composes – is met neatly, compellingly – I would add: necessarily – by phenomenal properties. For not only are they the sole absolutely, in-and-of themselves qualitative properties that we know of, but they positively satisfy and exhaust the profile of the desired natures. There is just no room to see what else could have absolute quality in and of itself, without *thereby* being an experiential quality. To be qualitative absolutely, in-and-of yourself, then, is to be qualitatively experiential – that is, conscious.

More formally put, then, the new argument for panpsychism runs like this:

Premise 1. The microphysical ultimates have absolutely intrinsic qualitative natures.
Premise 2. That which is absolutely intrinsically qualitative is experiential.
Therefore: The ultimates are intrinsically experiential. Panpsychism is true.

In this section I have spent my time motivating premise 2, having taken Russell and Rosenberg to have motivated premise 1 for me already.

conceptual independence will be thought to fall short of expressing solid, real world relations, which are (had better be) at issue. Could it be that *ontological* independence is the right sense? While perhaps depending on other entities for the contingent fact of its tokening, an area of absolute qualitativeness owes no debts at all as regards *being the way that it is, given that it is*.

3. Conclusion

It is not humano-centricity, far from it, that drives the panpsychist ontology. It is nothing more nor less than the strict and sober metaphysical demands of the world that we find ourselves inhabiting, if we still harbor any hopes of being realists about it and all that we know it to contain.

CHAPTER 5

The conscious connection

A psycho-physical bridge between brain and pan-experiential quantum geometry

Stuart R. Hameroff and Jonathan Powell

Can conscious experience – feelings, phenomenal qualia, our 'inner life' – be accommodated within present-day science? Those who believe it can (e.g. proponents of physicalism, reductionism, materialism, functionalism, computationalism) see conscious experience as an emergent property of complex computation in networks of brain neurons. In these approaches consciousness is viewed as a higher order effect emerging from lower level, non-conscious entities.

Others believe consciousness cannot be accommodated within present day or future science. Cartesian dualists see consciousness and physical matter as separate and irreconcilable. A modern version of dualism is 'mysterianism,' or cognitive closure, which suggests that consciousness exists within science but cannot be understood by conscious beings, and we should stop worrying about it.

A third set of philosophical positions ascribes to consciousness (or its precursors) ontological status as a foundational component of reality. These positions (e.g. panpsychism, pan-experientialism, idealism) relate consciousness to irreducible ('funda-mental') components of reality, something akin to mass, spin or charge. These views take consciousness to be present in low level entities, in which – on some readings – they inherently contain a phenomenal nature or subjective experience (qualia). Consciousness or its 'proto-conscious' precursors are thus somehow built into the structure of the universe – a view that we might label *pan-protopsychism*.

Most of these views are monist in nature, in that they take reality to be, ultimately, a single entity or substance. At issue, then, are two key points: (1) the essential characteristic(s) of this monist substance, and (2) how it gives rise to apparently diverse entities like 'mind' and 'matter.' If the one reality is essentially mind-like, then we have a form of idealism – which may or may not entail panpsychism. If it is essentially physical or material, physicalism obtains.

Alternatively, the one reality can be seen as something other than mind or matter, in which case we have a form of neutral monism; Spinoza, James, and Russell are typically cited as holding this view. A contemporary form of neutral monism – one

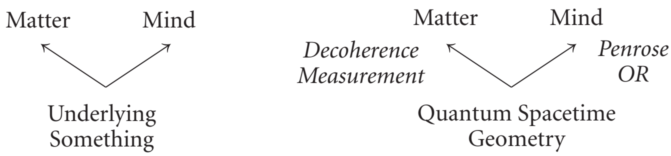

Figure 1. Left: Neutral monism, in schematic form. Right: Neutral monism in the context of modern physics. Quantum spacetime geometry is the neutral reality, and Penrose OR is the psycho-physical bridge.

defended in this paper – defines the one reality in terms of *quantum spacetime geometry*, i.e. as a consequence of the fine-grained structure of the universe. Figure 1 summarizes the situation.

The 20th century rise of computation and cognitive science cast consciousness – mind, the mental – as a computational processing of discrete (e.g. digitized) information. Regarding 'the physical,' advances in string theory, quantum field theory, quantum geometry and other approaches attempt to account for the fine structure of the physical world differently, but are all based on discrete quantized units of *information*. Wheeler (1994), Smolin (2001), Lloyd (2008) and others have suggested in various ways that information is fundamental to the nature of reality, and that in some sense the universe is composed of interactive information processing – that the universe is, in essence, a computer.

Applying an information-based reality to neutral monism, Bateson (1970), Bohm (1986), Wheeler (1994) and Chalmers (1996) proposed dual-aspect panpsychist (or near-panpsychist) theories in which information has both a) psycho/experiential/mental, and b) physical/material aspects. But the question remains: How, specifically, are these two aspects related? What is the connection between them?

This notion of a connection or bridge between mind and matter has been examined at least since the 1920s. Harvard philosopher Leonard Troland (1922) speculated about "psycho-physical bridging principles" as a way of unifying the two, and of putting mind on firm theoretical foundations. Chalmers later adopted this notion, combining it with an information-based ontology to arrive at a tentatively panpsychist theory of mind. But neither of these two men elaborated on the nature of this bridge, nor how it might function.

We propose that a pathway to understanding consciousness might be found in identifying both sides of the bridge, and the nature of the connection, i.e. the bridge itself. We attempt to describe the psycho-physical bridge using the Penrose-Hameroff Orch OR theory of consciousness. The underlying psycho/experiential/mental side that embeds proto-conscious experience is described in the physics of quantum geometry at the Planck scale, the most fundamental level of the universe. The physical/material side resides in the brain – specifically, in quantum electron dipole states mediating computations in microtubules and other biomolecular structures involved in consciousness. The connection between the two sides – the psycho-physical bridge –

is a specific process called Penrose objective reduction (OR), a proposed threshold for quantum state reduction inherent in Planck scale quantum geometry. Pan-protopsychism thus becomes the most accurate picture of our universe.

Orch OR describes how well-understood neuronal-level functions (e.g. axonal firings, synaptic transmissions, dendritic synchrony) 'orchestrate' quantum computations in microtubules within brain neuronal interiors. The quantum computations reduce to classical solutions by Penrose OR, connecting brain functions to Planck scale quantum geometry which may embed proto-conscious experiential qualities. Orch OR events are correlated with gamma synchrony EEG occurring roughly 40 times per second; conceptually, these may be seen as equivalent to Whitehead's "occasions of experience."

1. Discrete conscious moments and quantum state reductions

Pan-experiential philosopher Alfred North Whitehead (1929; 1933) viewed the universe as comprised not of things, but of *events* – in other words, as a process. Two centuries earlier, Leibniz (1714) had quantized reality, describing fundamental 'monads' as the ultimate entities of reality, but Whitehead transformed monads into "actual occasions" occurring in a "basic field of proto-conscious experience." Whitehead's occasions are spatio-temporal quanta, each endowed – usually on a very low level – with mentalistic characteristics like "experience, subjective immediacy, appetition." In his view, highly organized collections ("societies") of occasions permit primitive mentality to become intense, coherent and fully conscious.

But Whitehead's theory of mind is counterintuitive: Is consciousness indeed quantized, composed of discrete events? Trained Buddhist meditators describe distinct 'flickerings' in their experience of reality. Buddhist texts portray consciousness as "momentary collections of mental phenomena," and as "distinct, unconnected and impermanent moments which perish as soon as they arise." Our normal conscious experience seems continuous, but so does a motion picture – even though we know it to be composed of discrete frames. There is no doubt that we perceive motion pictures as continuous despite their actual 'quantized' structure. Perhaps consciousness is the same.

Some Buddhist writings even quantify the frequency of conscious moments. For example the *Sarvaastivaadins* (von Rospatt 1995) describe 6,480,000 'moments' in 24 hours (an average of one moment per 13.3 msec), and some Chinese Buddhists as one 'thought' per 20 msec. Others describe the duration of a conscious moment as "1/64th the snap of a finger." All these are consistent with gamma synchrony.

William James (1890) initially considered consciousness a sequence of 'specious moments' but later embraced the idea of a continuous 'stream of consciousness.' The 'perceptual moment' theory of Stroud described consciousness as discrete events, rather like sequential frames of a movie.[1] Evidence in recent years suggests periodicities for perception and reaction times in the range of 20 to 50 milliseconds (gamma EEG waves; 30 to 90 Hz) and another in the range of hundreds of milliseconds (alpha and theta EEG waves; 3 to 7 Hz), the latter consistent with saccades and the visual gestalt (VanRullen & Thorpe 2001). Regarding visual consciousness, several author groups (Woolf & Hameroff 2001; van Rullen & Koch 2003) have suggested that integrated visual perceptions are a series of fast gamma waves (each corresponding to specific components of vision, e.g. shape, color, motion, meaning) riding on a slower, e.g. theta, wave. Similarly, Freeman (2006) has characterized theta wave steps with finer scale cortical dynamics as video-like frames of conscious content.

Using visual consciousness as an example, if we equate the visual gestalt with a cinematic scene, consciousness may be considered sequences of scenes ($\sim$3 to 7 scenes per second), each composed of sequences of individual frames ($\sim$10 to 30 frames per scene, hence 40 or more frames per second). Gamma frequency frames could relate to Whitehead's low-level mental occasions, and theta frequency scenes to his 'intense, coherent and fully conscious' occasions.

If so, what are 'occasions of experience'; what is the 'basic field of proto-conscious experience'; and, how does the brain fit in? What underlying process correlates with synchronized gamma and theta frames and scenes? Abner Shimony (1993, 1997) recognized that Whitehead's approach was potentially compatible with modern physics, specifically quantum theory, and suggested that quantum state reductions – actual physical events – could represent Whitehead's "occasions."

2. The quantum/classical divide

The material reality we perceive is the physical side of the psycho-physical bridge. But upon inspection, physical reality appears to derive from a deeper, non-material quantum level. The everyday 'classical' world is composed of matter and energy following Newton's laws of motion, Maxwell's equations for electromagnetism, and other predictable behaviors. At small scales, however, the bizarre laws of quantum mechanics reign.

Atoms and sub-atomic quantum particles may exist in two or more states or places simultaneously, more like waves than particles, and existing as multiple coexisting possibilities known as *quantum superposition,* governed by a quantum wave function. But we don't see multiple coexisting wave-like possibilities in our everyday, classical world. We see objects and particles as definite, classical material things in specific locations and states. Even when we measure atomic and sub-atomic systems they behave classically. The issue of why we don't see quantum superpositions in our everyday classical

1. For an early study, see J. Stroud, "The fine structure of psychological time," in *Information Theory in Psychology* (1956).

world is known as the 'measurement problem,' which has led to various interpretations of quantum mechanics (discussed below).

Another quantum property is 'entanglement,' or quantum coherence, in which components of a system become unified, governed by one common quantum wave function. If one member of an entangled system is measured or perturbed, other members are instantaneously affected, even over great distances.

One example of entanglement is the famous 'EPR pairs' (after Einstein, Podolsky and Rosen, who posed the problem as a thought experiment in the 1930s). Imagine two members of a quantum system (e.g. two electrons with complementary spin: if one is spin up, the other is spin down, and vice versa). If the paired electrons (both in superposition of both spin up and spin down) are separated by being sent along different wires, say to two different villages miles apart from each other, they each remain in superposition. However when one superpositioned electron is measured by a detector at its destination and reduces/collapses to a particular spin, (say spin up), its entangled twin miles away *instantaneously* reduces/collapses to the complement (spin down). The nonlocal effect has been verified with electron spin pairs, polarized photons and other quantum systems but remains unexplained.[2] Entire clouds of millions of atoms have been entangled. Non-local entanglement – referred to as 'quanglement' by Penrose – remains a fundamental mystery.

Another form of entanglement occurs in quantum coherent systems such as Bose-Einstein condensates in which a group of atoms or molecules surrenders individual identity and are governed by a single quantum wave function. If one component is perturbed, all components 'feel' it and react accordingly.

Quantum superpositions and entanglements have very practical consequences; they are used technologically in quantum information processors. Conventional classical computers represent digital information as 'bits' of either 1 or 0. In quantum computers information may be represented as quantum superpositions of both 1 *and* 0 (quantum bits, or 'qubits'). While in superposition, qubits interact with other entangled qubits, allowing computational interactions of enormous speed and near-infinite parallelism. During quantum computation, the superposed entangled system must be isolated from the environment to avoid decoherence – a loss or degradation of quantum properties. After the quantum computation has run, qubits are 'measured,' i.e. exposed to the classical environment, which causes an abrupt loss of superposition (state reduction/collapse), reducing qubit values to specific classical states (1 or 0) which constitute the solution. Measurement-induced reduction (like decoherence) introduces randomness in the choice of particular classical state outputs (the randomness is overcome by redundancy). Quantum cryptography and quantum teleportation also utilize quantum superposition and entanglement, and promise to revolutionize information processing.

2. See A. Aspect, P. Grangier, and G. Roger (1982), "Experimental realization of Einstein-Podolsky-Rosen-Bohm *Gedankenexperiment*: a new violation of Bell's inequalities." (*Phys. Rev. Lett.* 48:91–94).

However, the underlying mechanisms remain unknown. What does it actually mean for an object to be in two or more places or states simultaneously? How can nonlocal entanglement occur? What happens to isolated quantum superpositions?

Experiments near the turn of the 20th century seemed to show that the multiple possibilities in quantum superpositions persisted until observed by a conscious human. This led prominent quantum theorists like Bohr, Heisenberg and Wigner to conclude that *consciousness* caused quantum state reduction, that consciousness 'collapsed the wave function' (this is the so-called Copenhagen interpretation, reflecting the Danish origin of Nils Bohr, its leading proponent). This pragmatic approach allowed quantum systems to be studied successfully, putting aside both consciousness and underlying reality.

Modern interpretations consider any interaction of superposed systems with the classical environment to cause loss of superposition and to 'decohere' the quantum state to randomly chosen classical states. But again, the fate of *isolated* superpositions is unknown.

Another approach is the 'multiple worlds' hypothesis which asserts that every superposition is a *separation in the universe itself*, and that each possibility evolves into its own universe.[3] Hence there exists an infinite number of worlds co-existing in perpetual superposition.

David Bohm (e.g. Bohm & Hiley 1993) proposed that the wavefunction contains active information which guides the movement of particles, and that consciousness was associated with active information. Both Bohm and the multiple worlds view avoid quantum state reduction, or collapse of the wave function. Henry Stapp's view (Stapp 2004) identifies consciousness with collapse/reduction.

Some theories propose an objective threshold for quantum state reduction, hence 'objective reduction' (OR). One such OR threshold was proposed by Ghirardi, Rimini and Webber, who suggested that spontaneous self-collapse occurs when a critical number of particles are in superposition. Subsequent experiments, however, have failed to confirm their threshold.

The objective reduction (OR) of Roger Penrose is, at its base, similar to the multiple worlds view in which each superposition is a separation in the underlying fabric of the universe, expressed as quantum spacetime geometry. But according to Penrose the spacetime separations are unstable and will spontaneously self-collapse/reduce to single spacetime geometries at a specified objective threshold degree of separation. These OR events are quantum level processes – ripples – in the fundamental geometry of the universe. Penrose proposed that such objective reductions were essential to consciousness.

So: What *is* the fundamental geometry of the universe?

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3. The classic study was done by Everett in 1957; see his article "Relative state formulation of quantum mechanics." (*Rev. Mod. Physics*, 29:454–462).

3. The psycho/experiential side of the psycho-physical bridge: Quantum spacetime geometry

Atoms, atomic nuclei and electrons occupy only a small fraction of an atom's volume – most of an atom is empty space. What is empty space?

Democritus (circa 400 BCE) described empty space as a true void, whereas Aristotle saw a background "plenum" filled with substance. Maxwell's 19th-century "luminiferous ether" sided with Aristotle, but attempts to detect the ether failed. Furthermore, Einstein's special relativity suggested that there was no background pattern or structure at all. However, Einstein's general relativity related mass to curvature in a geometric spacetime 'metric,' and swung the pendulum back to the view of an underlying pattern in 4-dimensional spacetime. Where, then, is the pattern? At what level of the universe could quantized information occur and interact?

As we go down in scale from the size of atoms (10^{-8} centimeters), spacetime is smooth and featureless until eventually we find granularity at the incredibly small 'Planck scale' of space and time (10^{-33} centimeters, 10^{-43} seconds). The Planck scale is the basement level of reality – the ground floor, if you will.

The best description of Planck scale geometry is through *loop quantum gravity* related to Penrose spin networks. (In comparison, string theory attempts to describe particles and energy through vibrating strings, but doesn't include the background medium in which the strings vibrate.) Penrose portrayed the Planck scale as a dynamical web of spin networks.[4] Taking spin as an irreducible, fundamental entity, spin networks define spectra of discrete Planck scale volumes and configurations which dynamically evolve and define spacetime geometry. Smolin (2001) has described quantum spin networks as continually evolving, as being in some way alive. They may also qualify for Whitehead's 'basic field of protoconscious experience.'

The amount of potential information in Planck scale spin networks is vast; each Planck scale volume, or 'pixel of reality,' may be shaped by a huge variety of combinations of 'edge' lengths, number of spins per edge, and nonlocal interactions. In addition to the enormous potential variety in each Planck scale pixel, their sheer number compared to our macroscopic scale is enormous – there are roughly 10^{107} Planck volumes or pixels in the volume of a human brain, far greater than the number of particles in the universe.

Whether or not spin networks, twistor theory, loop quantum gravity or other approaches are correct, the fine structure of the universe is constructed of Planck scale quantum geometry whose configurations and dynamics lead to all matter and energy. Other avenues have suggested a holographic arrangement, so that Planck scale patterns and information may recur, fractal-like, at various larger scales.

If consciousness derives from fundamental, irreducible entities (e.g. 'protoconscious qualia'), they should be embedded in Planck scale geometry. Where else

4. See *Quantum Theory and Beyond* (1971; E. Bastin, ed.).

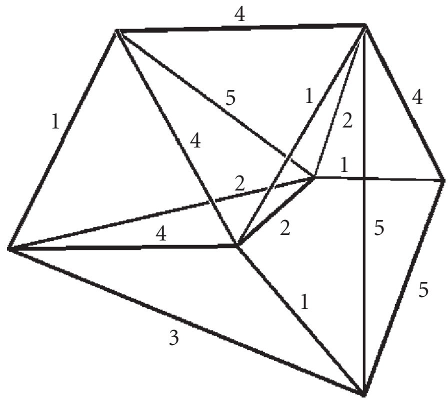

Figure 2. A spin network quantum mechanical description of the geometry of spacetime. Spin networks describe a spectrum of discrete, evolving Planck scale volumes and configurations (with permission from Smolin (Life of the Cosmos, Oxford University Press; 1997). Average length of each edge is the Planck length (10^{-33} cm); numbers indicate quantum spin values along each edge.

could they be embedded? Fundamental spacetime geometry is all there is! Quantum geometry is the prime candidate to contain proto-conscious experience. But a huge question remains: How could it connect to the brain to produce the richness of conscious experience?

4. Penrose OR – the conscious connection

Penrose OR is a theoretical construct which addresses several issues. It is a proposed solution to the measurement problem in quantum mechanics, explaining the fate of isolated quantum superpositions. It ties together quantum mechanics and general relativity, two branches of science which have been irreconcilable. And it offers an accounting of consciousness as a sequence of discrete events, each event being an objective reduction occurring in the brain.

Penrose OR is in one way similar to Everett's multiple worlds view, in which each superposition is a separation in underlying reality, i.e. with each and every superposition the universe bifurcates, or separates, with each possibility branching off to form a new universe, a new reality. Thus, according to this view, there exist an infinite number of parallel universes. For the Schrödinger's cat story (i.e. assuming superposition of such a macroscopic object is possible), each time the box is opened the universe bifurcates into one universe with a live cat, and another universe with a dead cat. But how are we to envision the universe – the fabric of reality – separating from itself?

For illustration we can ignore the details at the Planck scale and condense 4-dimensional spacetime into a 2-dimensional spacetime sheet: one spatial dimen-

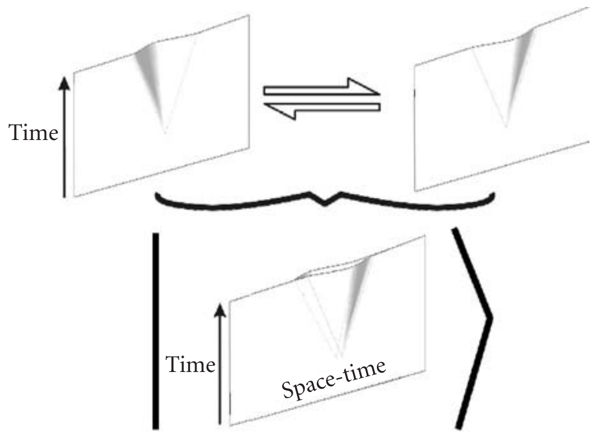

Figure 3. Four dimensional spacetime may be schematically represented by a two dimensional "spacetime sheet" with one dimension of space and one dimension of time. Mass is equivalent to curvature in spacetime, and the two spacetime curvatures (top) represent mass in two different locations or conformations respectively. At bottom, mass in quantum superposition (separated from itself) is simultaneous spacetime curvature in opposite directions, a separation, bubble or blister in spacetime geometry. At a critical degree of separation, the system becomes unstable and must select either one state or the other (from Penrose 1994: 338).

sion and one time dimension (Figure 3, top). This spacetime is slightly curved, in accordance with Einstein's general theory of relativity, in a way which encodes the gravitational fields of all distributions of mass density. Each mass density – each object or particle – effects a spacetime curvature, albeit tiny for small objects.

The idea of large objects causing large spacetime curvature is familiar. Einstein had predicted that the spacetime curvature of our sun would bend light from stars, distorting their position from our vantage point. Some 50 years after this prediction, Sir Arthur Eddington made the critical observations during a solar eclipse to prove Einstein's hypothesis. However, the idea of small, quantum objects causing small spacetime curvatures was first put forth by Penrose.

Consequently we can view any mass in one location as spacetime curvature in a particular direction, and location of the mass in a different location as spacetime curvature in another direction. Therefore quantum superposition of a particle in two locations may be considered simultaneous curvatures in opposite directions (Penrose 1989, 1994). As in the multiple worlds view, the spacetime sheet separates into two opposing curvatures, resulting in a 'bubble' or 'blister' in underlying reality (Figure 3, bottom).

Strictly speaking the separations cannot be considered to have any true 'width,' or 'length,' as spacetime defines its dimensions, rather than exists in dimensions. However, metaphorically we can consider that the distance between the separated space-

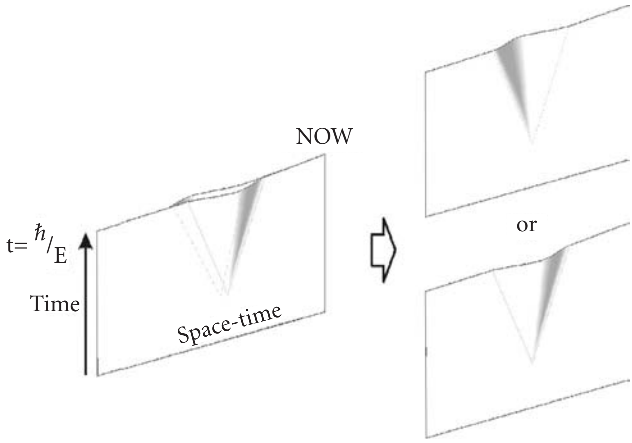

Figure 4. Penrose OR. Left: 2-dimensional space-time sheet in superposition. When time t becomes equal to ħ/E (NOW), OR occurs and (Right) one of the possible spacetime curvatures is selected as classical reality. Penrose proposed such OR moments incorporate conscious experience.

times (width) is on the order of a Planck length (10^{-33} centimeters) whereas the length may be macroscopic, on the order of the mass separation distance, e.g. nanometers (10^{-8} centimeters) or larger, or the distance over which mass separation distance occurs (e.g. ~10 centimeters, as may occur in the brain). That such 'narrow' separations have significant consequences may seem surprising. However, an analogy may be drawn to earthquakes in which the earth separates only slightly, but over a great length or faultline, with significant consequences.

In the multiple worlds view, each possible spacetime sheet – each side of the blister – evolves into a separate universe. In Penrose's view these separations, bubbles, or blisters are, however, unstable; somewhat like soap bubbles, they will eventually reduce, or collapse, to one particular curvature or the other, with the reductions occurring virtually instantaneously – actual events producing definite classical reality from quantum possibilities. The instability is inherent in the properties of spacetime geometry (quantum gravity) and constitutes an *objective* threshold for an isolated quantum state reduction, hence 'objective reduction.'[5]

This whole process has a direct bearing on the mind. Penrose proposed that objective reductions *are conscious*, and convey experiential qualities and conscious

5. Penrose has quantified the formulation in the following way. Objective reduction due to the quantum gravity properties of fundamental spacetime geometry occurs at a time t given by the Heisenberg indeterminacy principle $E=\hbar/t$, in which E is the magnitude of superposition/separation (one graviton), ħ is Planck's constant over 2π, and t is the time until reduction. The magnitude E is related to the gravitational self-energy of the superposition and may be calculated from the amount and distance of mass "separated from itself."

choice. Hameroff and Penrose (1996b) proposed this occurred due to pan-experiential qualities embedded in Planck scale geometry – that which we are calling pan-protopsychism. As actual events occurring in a medium which may be construed as a 'basic field of proto-consicous experience,' Penrose OR qualifies as Whiteheadian occasions (as suggested by Abner Shimony), and provide a psycho-physical bridge between pan-experiential quantum geometry and the brain. But where in the brain are OR events able to interface? What is the physical (brain) side of the psycho-physical bridge?

5. The biological side of the psycho-physical bridge – the Orch OR model

A connection from the Planck scale to the brain – a psycho-physical bridge – implies influence scaling up from infinitesimally tiny lengths and energies to result in conscious perceptions and choices, and hence causal efficacy in the classical world. To bridge this daunting chasm of scale, a quantum lever or amplifier must exist in the brain which is sensitive to Planck scale influence, and able to control or regulate neuronal processes relevant to consciousness. If we assume consciousness emerged during evolution, such functional quantum effects in biomolecules must have preceded consciousness, and have played (and continue to play) some general role in biological systems. Yet technological quantum devices must be isolated to near absolute zero to prevent decoherence. How can quantum systems control high energy biomolecules? It appears that isolated quantum zones exist within biomolecules, forming extended quantum phases in living systems (Hameroff 2008).

Proteins, lipids and nucleic acids based on carbon chemistry are the primary components of organelles and cells. They are described by various characteristics, one being solubility – a molecule's ability to dissolve in a particular solvent. Water is the major solvent in biomolecular systems.

Water is a *polar* molecule, with exposed electrical charges (positive on one end, negative on the other) allowing charge interactions with neighboring waters and charged molecules. Organic biomolecules generally have charged groups on their exterior surface which interact with and dissolve in water, and are referred to as 'hydrophilic' (water-loving).

Another type of solvent, e.g. benzene, is *non-polar*, hence oil-like, or fatty. This type excludes water (oil and water do not mix), and is referred to as hydrophobic (water-fearing).[6]

6. The degree of polar/hydrophilic versus non-polar/hydrophobic is quantified by the Hildebrand solubility co-efficient lambda λ. Water, the most polar solvent, has a very high λ coefficient of 48 SI units; the non-polar benzene has a low λ equal to 18.7 SI units (Hildebrand Solubility Parameters: /MPa1/2 = 2.0455 × /cal 1/2cm$^{-3/2}$ Standard Hildebrand values from Hansen, *Journal of Paint Technology* Vol. 39, No. 505, Feb 1967; SI Hildebrand values from Barton, *Handbook of Solubility Parameters*, CRC Press, 1983 and Crowley, et al., *Journal of Paint Technology* Vol. 38, No. 496, May 1966. http://sul-server-2.stanford.edu/byauth/burke/solpar/solpar2.html).

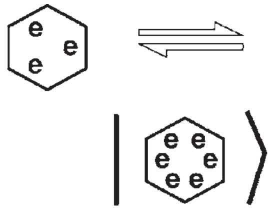

Figure 5. Six-carbon benzene (phenyl) ring with 3 mobile electrons. Top: electrons shift between two possible locations. Bottom: Quantum superposition of both location possibilities. Electron locations indicate electron cloud dipole fluctuations, i.e. van der Waals London forces

Organic biomolecules are generally 'amphiphilic', e.g. having both polar and non-polar regions. *Exterior* surfaces of biomolecules are polar, hydrophilic and water soluble. Within *interiors* of sufficiently large biomolecules are regions which are non-polar, hydrophobic and oil-soluble. Extended non-polar hydrophobic phases develop when biomolecules assemble and organize into structures and organelles. Lipid membranes contain an internal hydrophobic planar layer composed of non-polar groups in cholesterol and other lipids.[7]

Proteins have internal non-polar 'hydrophobic pockets' composed of amino acid residues (including the electronic ring structures of amino acids tryptophan, tyrosine and phenylalanine). These arrangements enable electron resonance effects in non-polar regions throughout biomolecules, organelles, cells and organisms. Most importantly, within this phase, quantum effects are shielded from decohering interactions with the polar environment.

As real-time engines of living systems, proteins provide movement, force and information processing. Protein ion channels, enzymes, receptors, cytoskeletal proteins all function by a process of *conformation*, or shape-changing. For many proteins, conformation is a delicate balance between countervailing chemical energies, such that quantum (London) forces in hydrophobic pockets are pivotal.

The benzene (or phenyl) ring is six carbons with 3 delocalizable carbon double bonds, i.e. three mobile electrons within a confined region which overall is electrically neutral (Figure 5). Electron location movements are described as electron cloud dipole fluctuations. Coupling between electron cloud dipoles, e.g. between neighboring benzenes, occurs via a type of van der Waals force called the London force.

When benzene and water are mixed, non-polar benzenes self-associate, pushed together by water – the hydrophobic effect – and attracting each other by London forces between electron cloud dipoles. Non-polar molecules aggregate into stable, low-lambda regions, e.g. oil droplets, shielded from polar interactions with environmental water. In biology, these effects drive protein folding and other forms of self-organization.

7. DNA and RNA have internal non-polar 'pi electron stacks' composed of hydrophobic regions of nucleic acids.

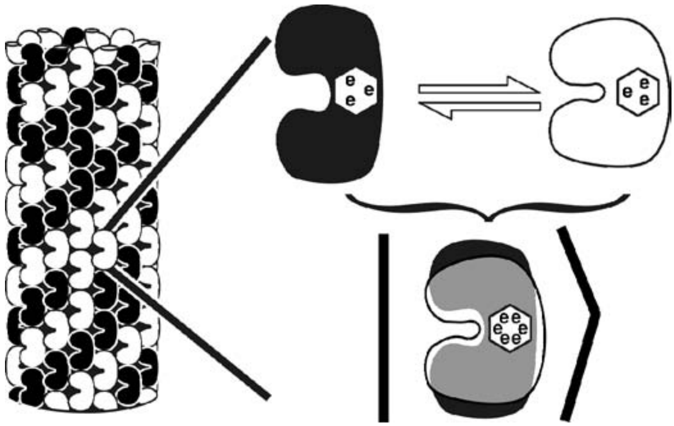

Figure 6. Left: Microtubule: a hollow cylinder of 25 nanometers diameter, consisting of tubulin proteins arranged in a skewed hexagonal lattice. Right top): Each tubulin molecule may switch between two (or more) conformations, coupled to quantum electron dipoles in a hydrophobic pocket. Right (bottom): Each tubulin can also exist in quantum superposition of both conformational states.

These quantum forces are essential to consciousness, as evidenced by the action of anesthetic gas molecules. Anesthetic gas molecules selectively erase consciousness, sparing other brain activities. They bind by London forces in non-polar, hydrophobic pockets in a group of brain proteins (receptors, channels, components of cytoskeletal microtubules, etc.). Presumably, such subtle quantum actions prevent or inhibit the normally-occurring quantum forces required for consciousness.

Hydrophobic pockets must be large enough for anesthetic gases to fit, thus during anesthesia quantum processes due to electron resonance in smaller non-polar regions continue, perhaps essential to non-conscious life functions. Cooperative resonance and entanglement among quantum forces in biomolecular assemblies have been proposed as an underlying mechanism of living systems (Hameroff 2008).[8]

Among anesthetic-sensitive proteins, *tubulin* – the constituent protein of *microtubules* – is arrayed in geometric lattices particularly suited to computation.[9] The Penrose-Hameroff model of 'orchestrated objective reduction' (Orch OR) proposes that neuronal processes potentially related to consciousness may be regulated by quantum computations occurring in cytoskeletal microtubules within the brain's neurons.

8. For an earlier study, see H. Fröhlich, (1975): "The extraordinary dielectric properties of biological materials and the action of enzymes." (*Proceedings of the National Academy of Sciences, 72)*.

9. See S. Hameroff and R. Watt, (1982): "Information processing in microtubules." (*Journal of Theoretical Biology*, 98).

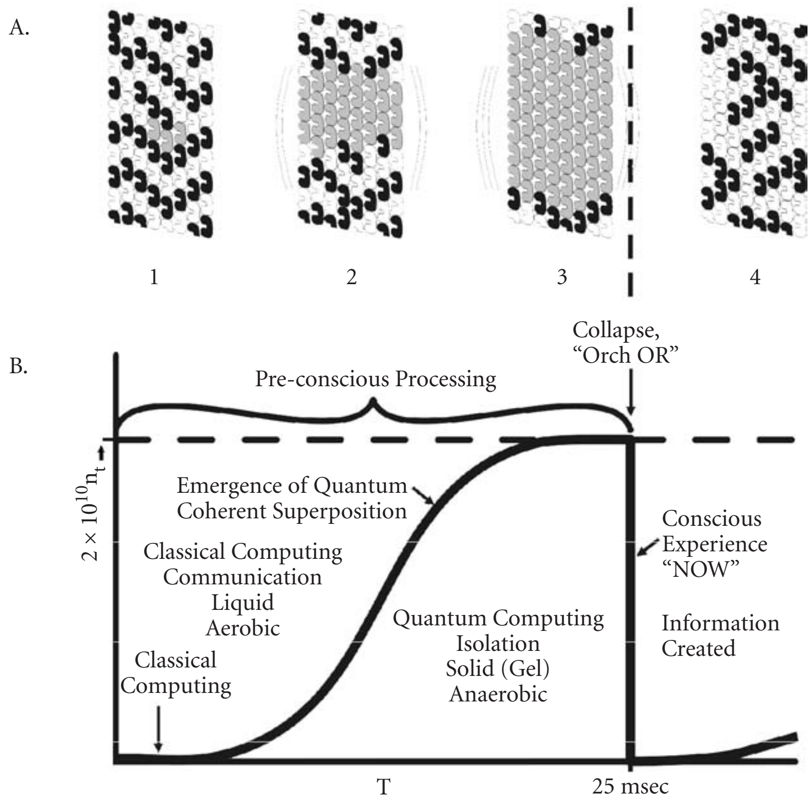

Figure 7. An Orch OR event. A. Microtubule classical computing (step 1) leads to emergence of quantum coherent superposition and quantum computing (steps 2&3) in certain (gray) tubulins. In Step 3 superposition meets critical threshold related to quantum gravity for self-collapse (Orch OR). A conscious event (Orch OR) occurs in the step 3 to 4 transition. Tubulin states in step 4 are noncomputably chosen in the collapse, and evolve by classical computing to regulate neuronal function. B. Schematic graph of proposed quantum coherence (number of tubulins) emerging versus time in microtubules. Area under curve connects superposed mass energy E with collapse time T in accordance with $E=\hbar/t$. E may be expressed as $N_{t,}$ the number of tubulins whose mass separation (and separation of underlying spacetime) for time t will self collapse. For T = 25 msec (e.g. 40 Hz oscillations), $N_t = 2 \times 10^{10}$ tubulins.

These processes are isolated and shielded from environmental decoherence by a variety of evolutionary adaptations (Hameroff & Penrose 1996a, 1996b; Hagan et al. 2002).

An essential feature of the Penrose-Hameroff Orch OR model is that tubulins become quantum superpositions of alternative conformations, and function as qubits by interacting nonlocally (entangling) with other tubulin qubits so that microtubules act as quantum computers (Figure 6). Microtubules whose tubulins are in quantum super-

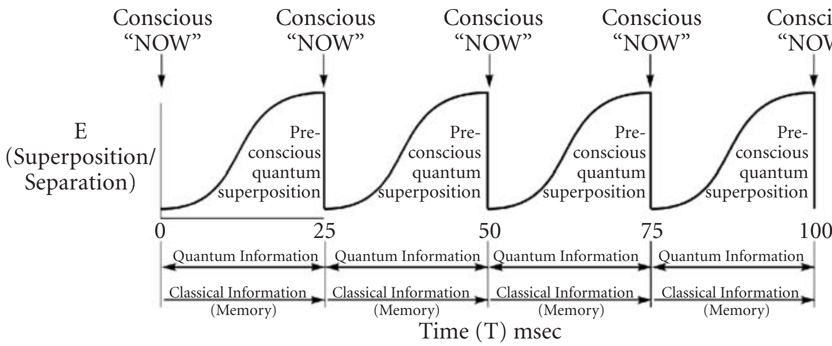

Figure 8. A sequence of OR conscious events occurring every 25 msec (consistent with brain activity at a frequency of 40 Hz). Pre-conscious quantum information reaches OR threshold (by E=ħ/T) resulting in an instantaneous conscious quantum state reduction "NOW" which may be equated to Whitehead "occasions of experience."

position in a particular neuron may entangle with those in other neurons via quantum tunneling across window-like 'gap junctions' between neurons. Gap junction-defined groups of neurons mediate gamma synchrony EEG, the best measurable correlate of consciousness.

Microtubules exist in all our cells, but only in the brain (presumably) are sufficiently large numbers of tubulins isolated from decoherence and entangled to reach threshold (by E=ħ/t) in reasonably short times, and thus to manifest consciousness.

When enough entangled tubulins are superpositioned long enough to reach OR threshold (by E=ħ/t), a conscious event (Whiteheadian 'occasion of experience') occurs. The classical tubulin states chosen in the OR event proceed to regulate classical neural activities, e.g. trigger axonal action potentials, adjust synaptic strengths and rearrange the cytoskeleton, thus exerting causal efficacy, learning and memory.

Gamma synchrony EEG correlating with consciousness is on the order of 25 milliseconds (1/40th second). For OR/Whitehead events in the brain to correspond with gamma-synchronized events we can use E=ħ/t and set t = 25 milliseconds (coherent 40 Hz). E is then equivalent to superposition/separation of approximately 2×10^{10} tubulins. Estimating for the percentage of tubulins per neuron involved in consciousness gives roughly *10,000 to 100,000 neurons* involved in each gamma-synchronized OR/Whitehead/conscious event.[10]

10. One apparent problem with this approach is that Planck scale gravitational energies proposed to influence protein conformational dynamics are exceedingly tiny compared even to ambient energies, often expressed as kT (Boltzmann's constant k times temperature T). The gravitational self-energy of one superpositioned tubulin is roughly 10^{-21} electron volts (eV) per tubulin, or 2×10^{-10} eV (10^{-28} joules) per 25 millisecond OR event. Ambient energy kT is approximately 10^{-4} eV (or 10^{-22} joules), 6 orders of magnitude greater than the gravitational self energy E. However the OR-induced 10^{-28} joules occur instantaneously. If we approximate the

Thus Orch OR provides a possible connection between quantum spacetime geometry – a possible repository of proto-conscious experience – and brain processes regulating consciousness.

6. Consciousness in the universe

Consistent with a general framework of neutral monism, a pan-protopsychist Orch OR places precursors of consciousness in Planck scale quantum geometry, the most basic level comprising the universe. Such precursors are presumably embedded in some way as *discrete information states*, along with other entities that give rise to the particles, energy, charge and/or spin of the classical world.

For Orch OR to be logically consistent, any quantum state reduction occurring via Penrose OR as determined by $E=\hbar/t$ would comprise a moment of conscious experience – a quantum of consciousness, a Whiteheadian 'occasion of experience' – regardless of whether it occurred in a brain, a biological system in general, or an inanimate object. Aside from biological brains, where else in nature might this occur? Is consciousness happening 'here and there' throughout the universe? It turns out that the conditions for $E=\hbar/t$ are rather stringent.

$E=\hbar/t$ means that superpositions which persist long enough (avoiding decoherence) to reach a time threshold t will collapse to classical states with a moment of conscious experience. Because E and t are inversely related, larger superpositions (larger E) will reach threshold sooner, i.e. with shorter time t. Smaller superpositions (smaller E) will require longer times t. In all cases, environmental decoherence resulting in loss of quantum superposition must be avoided long enough to reach threshold t for consciousness. Decoherence may be avoided through shielding and screening isolation, active pumping (e.g. lasers), quantum error correction topologies and/or decoherence-free subspaces (Hagan et al. 2002).

A single electron in superposition has a very small E, and would require a very long t – about 10 million years – to reach threshold. If a superpositioned electron avoided decoherence for 10 million years, according to Orch OR it would have a moment of consciousness. E is also purported to relate to the intensity of the experience, so the electron's moment of awareness would be extremely dull (analogous to a low energy, long wavelength photon). A large system in superposition (large E) would have a very brief t, and a high intensity experience (like a high energy, short wavelength photon). For example, superposition of a one kilogram rock avoiding decoherence would reach threshold for OR after only 10^{-12} seconds, and have a high intensity conscious mo-

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time interval to be within one Planck time of 10^{-43} seconds, each OR event delivers gravitational *power* (energy/time) equivalent to an instantaneous jab of 10^{13} watts (joules/sec), roughly 1 kilowatt per tubulin protein.

ment. Does this imply a rock could be conscious, perhaps even more conscious (higher intensity) than we humans?

Probably not. Rocks are composites of various types of atoms bound together by strong covalent bonds allowing little flexibility for influence by quantum processes. Electrons and other quantum-level particles comprising the structure of a rock are generally tied up in these chemical bonds, and mobile electrons within the rock have little or no influence on other components (unlike the situation in anesthetic-sensitive proteins whose conformation is leveraged or amplified by activities of electrons).

Another consideration is what 'superposition' of a rock would actually mean. Would a rock be separated from itself as one object, or separated at the level of its constituent atoms or sub-atomic particles? Large scale superpositions are more readily obtained in crystal-like structures composed of geometric arrays of one type of atom or particle.

Consider a particular type of rock made entirely of carbon atoms in a crystal-like structure of benzene-type rings with delocalizable electrons ('graphene') – otherwise known as diamonds. Indeed, quantum spin effects occur in diamonds at room temperature. However, only the mobile electrons within the diamond are in quantum superposition, as the carbon nuclei are held rigidly in the classical structure. Because of their low mass (small E), by $E=\hbar/t$, electrons in superposition within a diamond (assuming they avoided decoherence caused by, e.g., light passing through it) would require a very long time to reach threshold for OR and a conscious moment – something like 1 year for 10 million superpositioned electrons.[11]

On the other hand, Penrose observed that interiors of neutron stars may have huge quantum superpositions which would reach OR with very large E, brief t and high intensity.[12] By Orch OR criteria such events would indeed be conscious. But because the conditions are presumably random, such conscious moments would lack cognitive information processing: OR without Orch. Similarly, OR conscious moments without cognition may be occurring in various crystal-like, large scale quantum materials throughout the universe.

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11. Similarly, technological quantum computers will utilize superpositions of electrons or other small particles as qubits, and they too will have very small E, requiring extremely long decoherence-avoiding t for conscious moments. On the other hand, anesthetic-sensitive brain proteins have non-negligible mass whose conformational states are coupled to quantum electron states. For technological quantum computers to be conscious, according to Orch OR, they would require quantum electrons coupled to significant mass, e.g. perhaps in Fullerene-type structures.

12. The idea that stars might have 'minds' of some sort was speculated on by J. B. S. Haldane in the 1930s: "It is not inconceivable that in such [stellar] systems resonance phenomena of the complexity of life and mind might occur. ... [I]t is conceivable that the interior of stars may shelter minds vastly superior to our own, though presumably incapable of communication with us." (1934: 97). But he was far from the first; Plato, Aristotle, and several of the ancient Greeks argued that stars were ensouled.

Astrophysicist Paola Zizzi has applied Penrose OR to the problem of inflation in the early universe. During the Big Bang, the universe expanded (inflated) rapidly – for about 10^{-33} seconds. But rapid inflation then stopped abruptly, and expansion has been slow ever since. Zizzi (2002) considered that during inflation the universe was in quantum superposition of multiple possible universes. Using $E=\hbar/t$ and setting E to the mass of the universe, Zizzi calculated that OR threshold would be met, surprisingly, at 10^{-33} seconds into the Big Bang, and conjectured that the end of inflation coincided with the universe undergoing a *cosmic conscious moment* (the 'Big Wow'). She further suggested our individual consciousnesses are literal microcosms related to the initial cosmic conscious moment.

It is argued, then, that pan-protopsychic qualities leading to conscious experience are woven into the quantum entanglements of the universe. This should be no less mysterious than electromagnetic fields emerging from Planck scale precursors of charge and spin. But is the Planck scale information random? Or is there a plan, rhyme or reason? Penrose proposed that non-computable information, including 'Platonic' values, might be encoded in Planck scale geometry. Could there be not only proto-conscious experience, but also *wisdom* and *intelligence* in the fine grain of reality?[13]

7. Conclusion

Cognitive brain functions, including sensory processing and motor control of behavior, are often non-conscious – terms like 'easy problems,' 'zombie modes,' or 'auto-pilot' apply here. These non-conscious functions are explained by synaptic neurocomputation in axonal-dendritic networks, i.e. the brain's neuronal firings and synaptic transmissions acting like 'bit states' and switches in computers. They are not really easy, but at least approachable through neurocomputation. Consciousness, however, does not naturally derive from neurocomputation – hence the 'hard problem.'

But consciousness and non-conscious cognition are not separable. At times, habitual auto-pilot modes become driven or accompanied by conscious experience. We often walk or drive while daydreaming, seemingly on auto-pilot with consciousness somewhere else. When novelty occurs we consciously perceive the scene and assume conscious control. So rather than a distinction between non-conscious auto-pilot modes on the one hand, and conscious experience on the other, the essential distinction is between non-conscious modes which at any given moment are, or are not, accompanied by some added fleeting feature which conveys conscious experience and

13. The two authors differ on this. SH agrees with Penrose on non-random Platonic Planck scale information, whereas JP does not. David Bohm, incidentally, would clearly agree: "in a way, nature is alive, as Whitehead would say, all the way to the depths. And intelligent. Thus it is both mental and material, as we are..." (1982: 39).

choice. That feature, the neural correlate of consciousness (NCC), appears to involve spatio-temporal envelopes of gamma synchronized dendritic activity moving through input layers in the brain's neurocomputational networks. Dendritic synchrony conveys a 'conscious agent' able to experience and control – tune into and take over – otherwise non-conscious neurocomputation.

The conscious agent is Orch OR. It operates in microtubules within gamma-synchronized dendrites, generating e.g. 40 conscious moments per second. Each conscious moment, each occasion of experience, is, according to Penrose OR, an event or transition in spacetime geometry. Consciousness is a sequence of transitions, of ripples in fundamental spacetime geometry, connected to the brain through Orch OR. Pan-protopsychism thus provides the best general framework for understanding the mind-matter bridge, and hence the nature of reality.

CHAPTER 6

Can the panpsychist get around the combination problem?

Philip Goff

Consciousness, understood as the property of *being a thing such that there is something that it is like to be that thing*, is not an invention of philosophers. We ordinarily suppose that there is something it is like to be a normal functioning human being or animal (at least an animal above a certain level of complexity). But everyday thought restricts attributions of consciousness to organisms. We do not ordinarily believe that there is something that it is like to be the little bits that make up our brains.

Many philosophers find this commonsense position problematic. It holds that organisms are made up of things which entirely lack experience, and yet somehow, at some level of complexity, experience magically emerges. Why do the interactions of several billion non-conscious things result in the emergence of conscious experience? Why don't we just get a complicated, non-conscious system? Viewed from certain angles, the emergence of consciousness from non-consciousness can seem like nothing short of a miracle.

Of course, there are various ways in which philosophers try to *dissolve*, rather than solve, this philosophical difficulty. Why should the emergence of consciousness from non-consciousness be any more problematic than the emergence of life from non-life, or the emergence of liquid from molecules that are not themselves wet? But many remain unconvinced by such analogies. It seems prima facie that I can conceive of my zombie twin: an atom for atom duplicate of me that lacks conscious experience. In contrast, it is far from clear what it would be to conceive of an atom for atom duplicate of me which is not alive, or an atom for atom duplicate of Lake Geneva which is not wet. For these reasons the emergence of consciousness seems philosophically problematic in a way in which the emergence of life or water is not.

One explanation of the emergence of consciousness, powerfully advocated in recent times by Galen Strawson (2006), is panpsychism. Panpsychism is the view that the ultimate constituents of the physical world are conscious; that there is something that it is like to be the ultimate constituents of the physical world. If the littlest bits that make me up are themselves conscious, then arguably we no longer have the mystery of how little non-conscious things come together to constitute something with conscious experience. It seems like we don't need to explain where consciousness came from if it was there all along.

1. The combination problem

There is a significant difficulty facing the attempt to explain the consciousness of organisms in terms of the consciousness of their ultimate constituents, a problem which is often referred to as 'the combination problem.' The problem is that subjects of experience, i.e. things which have consciousness (things such that there is something that it is like to be them), just don't seem to be the kind of things that can 'sum together' to make other subjects of experience. The problem was vividly articulated by William James:

> Take a hundred of them [feelings], shuffle them and pack them as close together as you can (whatever that may mean); still each remains the same feeling it always was, shut in its own skin, windowless, ignorant of what the other feelings are and mean. There would be a hundred-and-first feeling there, if, when a group or series of such feelings were set up, a consciousness *belonging to the group as such* should emerge. And this 101st feeling would be a totally new fact; the 100 feelings might, by a curious physical law, be a signal for its *creation*, when they came together; but they would have no substantial identity with it, nor it with them, and one could never deduce the one from the others, or (in any intelligible sense) say that they *evolved* it. (1890/1950: 160)

Small objects with certain shapes, e.g. lego bricks, can constitute a larger object with a different shape, e.g. a lego tower. But it is difficult to see how, say, seven subjects of experience each of which have a visual experience as of seeing one of the colors of the spectrum (and are such that between them they instantiate visual experiences of all seven colors of the spectrum), could constitute a distinct subject of experience having a visual experience as of seeing white.

The most tempting response to the combination problem is to claim that we are simply ignorant of the way in which experiences sum, and that this is no good reason to think that they don't. However, I think there is good reason to think that at least some of the motivation for the combination problem is rooted, not in ignorance, but in a priori knowledge concerning the nature of subjects of experience. Specifically, I take the following to be a principle we can reasonably take ourselves to know a priori:

> **No Summing of Subjects (NSS)**: The existence of a group of subjects of experience, $S_1 \ldots S_N$, instantiating certain phenomenal characters, never necessitates the existence of a subject of experience T, such that what it is like to be T is different from what it is like to be any of $S_1 \ldots S_N$.

We can understand this principle by contrasting it with the case of spatial objects. Take the case of seven lego cubes placed on top of each other to make a rectangular tower. The mere existence of those bricks, each having a specific shape and location, necessitates the existence of the tower having the shape and location it has. We could not coherently conceive of the seven bricks being piled on top of one another in the way that they are in the absence of the tower. In contrast, it is eminently possible to conceive of our seven subjects of experience experiencing the colors of the spectrum, existing in the absence of a subject of experience having an experience of white. The existence of a group of spatial objects, $O_1 \ldots O_{N,}$ with certain shapes and locations, can necessitate the existence of a spatial object with a shape and location different to the shape and location of each of $O_1 \ldots O_N$. It does not seem that subjects of experience, merely in virtue of their existence, can stand in this kind of necessary relation.

How could this principle be objected to? NSS seems to clearly hold for all subjects of experience of which we can conceive. To take another example, ten subjects all feeling slightly pained do not necessitate the existence of a very pained subject. But perhaps it might be claimed that we have no reason to think NSS holds for *all* subjects of experience, including those of which we have no conception. Without doubt, there are many kinds of subjects of experience which we cannot conceive of. As has been pointed out before, we are not able to conceive of what it is like to be a bat.

But any qualitative difference between two subjects of experience, qua subjects of experience (i.e. considered simply as things with consciousness), is merely a matter of a difference in the phenomenal characters that characterize their experience, a difference in what it is like to be those subjects. NSS holds for any group of subjects of experience we can conceive of, regardless of what it is like to be them. The principle seems to hold independently of what it is like to the subjects it concerns. NSS seems to be a conceptual truth concerning the determinable property of *being a subject of experience*, rather than any specific determinates of it.

I do not know how to demonstratively prove that there is not a possible set of subjects of experience which constitute a counterexample to NSS: i.e. a group of subjects of experience which, by their mere existence, necessitate the existence of some distinct subject of experience. But reflection shows NSS be true with regards to all the many varied subjects of experience we are able to conceive of, in a way that doesn't seem dependent on the specific phenomenal characters they instantiate. I take it, therefore, that NSS is a principle we can reasonably take ourselves to know.

2. Making sense of experiences summing

What implications does NSS have for the summing of experiences? It follows from NSS that a certain set of subjects of experience cannot sum *merely in virtue of their existing (and instantiating the specific phenomenal characters they instantiate)*. But it does not imply that a certain set of subjects of experience cannot exist and be involved in some *state of affairs* which necessitates the existence of some distinct subject of experience. There is nothing in the principle which rules out the possibility of there being some state of affairs of a certain set of subjects of experience *being related in some specific way*, which necessitates the existence of some distinct subject of experience.

To put it another way, NSS implies that there is no state of affairs of the form <subject of experience S_1 exists with phenomenal character x, and subject of experience S_2 exists with phenomenal character y> which necessitates <subject of experience S_3 exists with phenomenal character z>. But it does not imply that there is not some state of affairs of the form <subject of experience S_1 with phenomenal character x bears relationship *R* to subject of experience S_2 with phenomenal character y> which necessitates <subject of experience S_3 exists with phenomenal character z>. Such a sense of experiences summing is not ruled out by NSS.

Neither introspection nor perception affords us experience of any such relation, call it 'phenomenal bonding,' which bonds subjects of experience together to constitute other subjects of experience. Indeed, in line with what James says above, I don't think we have experience of *any* natural relation between subjects of experience qua subjects of experience. In so far as we can think of subjects of experience as spatially located (perhaps in people's heads), so we can conceive of spatial relations between them. But spatial relations are not phenomenal bonding relations. Just as the mere existence of a certain group of subjects of experience does not necessitate the existence of some distinct subject of experience, so the existence of a certain group of subjects of experience standing in certain spatial relations to each other cannot necessitate the existence of some distinct subject of experience.

But it is hardly surprising that we can have neither introspective nor perceptive experience of relations between subjects of experiences qua subjects of experience. We are unable to perceive relations between subjects of experience (qua subjects of experience) through the senses, simply because we are unable to perceive subjects of experience (qua subjects of experience) through the senses. If you examine my brain, you will not be able to see it instantiating phenomenal properties. I have epistemic access to only one subject of experience qua subject of experience, i.e. the subject of my own experience accessed via introspection. It follows from the fact that we can introspect only one subject of experience, that we cannot introspect how subjects of experience qua subjects of experience are related, for to introspect how subjects of experience qua subjects of experience are related we would have to be able to introspect more than one subject of experience. Given that we can experience subjects of experience qua subjects of experience only via introspection, and we have introspective access only to one subject of experience, it follows that we cannot experience subjects of experience qua subjects of experience as related.[1]

Locke, Berkeley and Hume held that experience provides all our ideas, which in turn provide meanings for our words. Because of this, they would take the fact that we cannot experience phenomenal bonding, either through the senses or through intro-

1. This explanation of why we are unable to experience relations between subjects of experience, is reminiscent of McGinn's (1989) explanation of why we are constitutively incapable of understanding how consciousness emerges from the physical.

spection, to imply that the term 'phenomenal bonding' is literally meaningless. But this strict meaning empiricism was based on a very crude philosophy of language. Nowadays philosophers do not take, say, our lack of experience of a four-dimensional object to imply that four-dimensionalism is an unintelligible view.

In the same way, it seems that we can intelligibly suppose that subjects of experience, qua subjects of experience, may bear relations to each other, even though we have no experience of these relations. Assuming subjects of experience do bear relations to each other, I can find no principled reason against supposing that there is some way of being related in which a group of subjects of experience can stand to each other in virtue of which they constitute a state of affairs which necessitates the existence of another subject of experience. In this way, contrary to views I have expressed in earlier work (Goff 2006), I believe that the panpsychist can make good sense of subjects of experience summing, and hence can get round the combination problem.[2]

3. The problem with this solution

Although I think the above solution is a coherent way for the panpsychist to avoid to combination problem, I think it leaves the panpsychist with a difficulty. She ends up ontologically committing not only to the conscious experience of particles, but also to the phenomenal bonding relation which unites the mini-subjects of experience into 'larger' subjects of experience. Whilst we may have a clear idea of what it would be for particles to be subjects of experience, there is a clear sense in which our understanding of the phenomenal bonding relation, and subsequently of the state of affairs of *a group of subjects being related in the phenomenal bonding way*, is incomplete.

We can define phenomenal bonding as 'that relation such that when subjects of experience bear it to each other the existence of a different subject of experience is necessitated,' and form an understanding of the phenomenal bonding relation in these terms. However, perhaps because we lack any experience of such a relation, we are unable to understand the state of affairs of *a group of subjects being related in the phenomenal bonding way* independently of what that state of affairs (if it exists) necessitates. Contrast with the case of spatial relations. We understand what it is for seven lego bricks to be on top of each other even if we are not thinking of them in terms of the tower they form. We cannot understand the state of affairs of *a group of subjects being related in the phenomenal bonding way* without understanding it in terms of the subject of experience which (if it exists) it necessitates.

2. The picture of subjects summing I have outlined here might be more similar to the spatial case than I have seemed to suggest. If relationalism about space is true, then spatial objects having the locations they do is a matter of their relational properties. Thus, in both the case of subjects summing and the case of spatial objects summing, relational properties are an essential ingredient of the summing.

But in the same way we might define a slightly different relation, call it 'physical-to-phenomenal bonding' as 'that relation such that when non-conscious physical particles stand in it to each other the existence of a subject of experience is necessitated.' We understand this relation as much and as little as we understand the phenomenal bonding relation. We understand 'physical-to-phenomenal bonding' in the sense that we can define it in terms of what the state of affairs of *a group of non-conscious physical particles being related in the physical-to-phenomenal bonding relation* necessitates. But we do not fully understand it in the sense that we cannot think about that state of affairs other than in terms of what (if it exists) it necessitates.

Just as our lack of full understanding of phenomenal bonding is no reason to deny the possibility of such a relation, so it seems to me our lack of full understanding of physical-to-phenomenal bonding is no reason to deny the possibility of this relation. We do not fully understand (in the sense I have specified above) how non-conscious particles could bond in some special way to form subjects of experience, but nor do we fully understand how subjects of experience could bond together to form different subjects of experience. It seems to me then that the panpsychist has the difficulty of answering the following question: why should we suppose that our conscious experience is the result of phenomenal bonding relating conscious particles rather than of physical-to-phenomenal bonding relating non-conscious particles?

Perhaps the panpsychist could claim that it is a lot more natural to suppose that conscious things emerge from other conscious things, rather than from non-conscious things. I think there may be some force to this point. But there are clear advantages to the opposing view too. On the panpsychist view, we are ontologically committed to *both* a relationship we don't fully understand *and* the conscious experience of particles. On the non-panpsychist alternative under consideration, we only have to believe in a relationship we don't fully understand. We save ourselves from a very demanding, and arguably counterintuitive, ontological commitment.

But doesn't panpsychism dissolve the mystery of the emergence of consciousness? If consciousness is there all along, then surely we don't have to worry about where it came from. The problem is that, by including a relation we don't fully understand, i.e. the phenomenal bonding relation, in her hypothesis, the panpsychist has admitted that the emergence of consciousness (or more precisely the emergence of *human and animal consciousness*, the consciousness of ultimate particles was of course there all along) is something we don't fully understand. The non-panpsychist theorist who postulates the physical-to-phenomenal bonding relation to explain consciousness must confess to a certain degree of ignorance as to how exactly non-conscious particles sum together to make subjects of experience. But similarly the panpsychist who commits to the phenomenal bonding relation must confess to a certain degree of ignorance as to how exactly little subjects of experience sum together to make human and animal consciousness, which is after all the kind of consciousness we have a pre-theoretical need to explain. It is not obvious that the former kind of ignorance is any greater than the latter.

What about zombies? If I can conceive of a physical duplicate of mine which lacks conscious experience, doesn't this entail that any merely physical duplicate of me is going to lack conscious experience? The theorist who postulates the physical-to-phenomenal bonding relation to explain my conscious experience can agree with this.[3] A purely physical duplicate of me would lack conscious experience, but a physical duplicate such that some of its fundamental constituents are related in the physical-to-phenomenal bonding relation cannot, by the very definition of the physical-to-phenomenal bonding relation, lack conscious experience.

4. Conclusion

I don't think that the combination problem signals the end of panpsychism. There is at least one coherent way in which panpsychist can get around this problem. But getting round the combination problem does, I believe, involve the panpsychist in some degree of mysterianism. The panpsychist, because she must confess to not fully understanding the phenomenal bonding relation, ends up with a view whereby the emergence of human and animal consciousness is something of a mystery. This results in a problem with the motivation for the view. Once the panpsychist introduces a degree of mysterianism into her view, she then has the challenge of showing why her view should be preferred to non-panpsychist mysterian alternatives.

There is no reason to think that the panpsychist cannot show a mysterian version of her view to be theoretically superior to non-mysterian alternatives. As we continue to theorize about the correlations between physical states (in the sense of states which physical science reveals to us) and conscious states, it may well be that the best theory to explain these correlations will predict that consciousness is more widely distributed in the world than ordinary thought supposes. Nevertheless, the panpsychist is obliged to make this case. Introducing an element of mysterianism into the view, which I believe to be inevitable if the panpsychist is to get around the combination problem, gets rid of any *obvious* advantage panpsychist accounts of consciousness might have been thought to have over non-panpsychist rivals. The panpsychist can get round the combination problem, but in doing so she is left with a lot of work to do in motivating her view.

3. I am understanding 'physical duplicate' here such that x is a physical duplicate of y iff physical science could not discern a difference between x and y.

CHAPTER 7

Universal correlates of consciousness

Stephen Deiss*

Science is finding it difficult to explain how and why a physical system like a brain can have conscious experience. We know a lot about the neuroanatomy and neurophysiology of color vision for example. However, we cannot explain why the sensation of color happens above and beyond the raw senseless physical process neuroscience can measure. In the following I offer a analysis of key concepts that continue to mislead us in efforts to explain consciousness. These concepts include sensation, perception, consciousness, ego, self, causality, mechanism and laws of nature. This analysis not only explains how the problem arises, but also presents a new rationale for why consciousness is a universal panpsychic process.

I propose a very intuitive explanation of human consciousness which I define as a process of *interpreting sensations*. Interpretation is a matter of finding *meaning*. The meaning resides in the *expectations and predictions* we attach to qualitative sensory contrasts using *associative memory*. These memory-based inferences are further sensations we have that typically involve visual or auditory imagery, in conjunction with our own thoughts and inferences – the 'voices in our heads.' From initial sensations we derive many more by association to complete our experience with our expectations of what lies beyond them. All these sensations fit together to comprise an integrated sensory interpretation which is our perception of reality.

Our reality, even that which we think we directly perceive, is a kind of informal but vivid *theory* derived from qualitative sensory contrasts. If we step away from the assumption of blind mechanisms in nature, it quickly becomes obvious that there is nothing radically different about brains in this regard, other than their advantage of a large associative memory. All systems that we study in science involve processes that are analogous to what goes on in our brains. Instead of senseless passive systems ruled by causal mechanisms and laws, we can view systems as active sensing agents that change and behave by constraint satisfaction. If all systems have sensations which they interpret as constrained by their state, which is a kind of *memory*, then *all* systems become sensation interpreters, and they have at least a modicum of consciousness.

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This all leads us to an unexpected rapport with all of nature because everything that happens involves sensing and interpreting. Science shows these processes are systematic and regular. That allows us to make useful predictions and find meaning in events. Personal experiences and behavior are also systematic and predictable. This all allows us to habitually theorize about a physical reality behind the appearances, a reality so compelling as to lead many to the self-defeating conclusion that consciousness is an unimportant by-product of physical brain processes. Consciousness is fundamental to any interpretation of events that would posit a physical reality, and it is the very same process by which all phenomena move forward from the present to the future. This scale-invariant process comprises the *universal correlates of consciousness* (UNCC) explained here.

In these pages a series of insights are presented that help put consciousness studies on more firm scientific ground and in the process put science itself on firmer ground without the dualism that opposes mechanisms against observers. This is a version of panpsychism (Skrbina 2005) presented here in an original way. I argue for *universal consciousness processes* rather than for one of the usual suspects: 'matter' or 'mind' or 'spirit' or something neutral in between.[1] Some arguments here were anticipated by others well known (Hume 1739; Mach 1886; Russell 1921). However, in most cases those views were not informed by recent insights from cognitive neuroscience, cognitive linguistics, and cognitive science.

I hope to avoid such metaphysical assertions, as I argue that what we need most is epistemology based upon sensations rather than a metaphysics based upon assumptions. Using this, one finds how things taken as straightforward scientific fact about both minds and physical things are really inferences from sensations, however seemingly unavoidable they appear. This insight can best be acquired by a sideways approach using the point of view of scientific physicalism itself.

After first showing why mechanistic explanations fail and providing a clear and intuitive definition of our consciousness as interpretation of sensations for adaptive purposes, I will give useful definitions of meaning, understanding and explanation as involving expectations and predictions. Next I explain how perception is a process of interpreting sensations to find their meaning, a kind of sensually vivid 1st order theory. I highlight the often overlooked prime importance of memory in understanding consciousness, and show how self-experience and ego-experience confuse things. A primitive and familiar mathematical model is provided to show how these ideas relate to quantitative systems oriented thinking. I add further clarification to show how common sense causal, lawful, mechanistic thinking makes us balk at accepting this notion of consciousness. In doing so I will make a small excursion into a different metaphor of how things happen that rejects classical concepts like causality and materialism from

1. "The view that seems to me to reconcile the materialistic tendency of psychology with the anti-materialistic tendency of physics is the view of William James and the American new realists, according to which the 'stuff' of the world is neither mental nor material, but a 'neutral stuff,' out of which both are constructed." (Russell 1921: 6).

the discussion. Lastly I offer some suggestions for the type of experiments that could help justify this view, and how to better interpret the wealth of scientific support we already have. The interpretive scientific process itself supports this thesis.

Part I: The essence of consciousness

1. Science in Denial: The problem of the mechanical observer

The prevailing scientific view is that the problem of consciousness will be solved in time by elucidation of neural correlates of consciousness (often abbreviated NCC) and that no deep mystery is involved (Crick 1994). Consciousness is an emergent property of brains and found nowhere else in nature. Other non-brain systems are purely mechanistic without consciousness lacking the requisite complexity needed to support it. The problem of consciousness will just evaporate as we learn more about how complex nervous systems process information. However, in spite of great advances in understanding how various neural subsystems produce various behaviors and how specific perceptual deficits depend on specific brain areas or global brain systems, there remains a lot of finger pointing (literally) as to where in all this complexity consciousness comes into existence.

It is highly questionable whether the problem will actually be solved this way even if we can turn reports of consciousness off and on at will by some experimental manipulation. The question will remain "Why does that, in particular, make us conscious of anything with the particular qualities we experience?" whether it be: the global workspace (Baars 1988), frontal-sensory executive loops (Crick & Koch 1998; Koch 2004), somatic markers (Damasio 1999), multiple drafts (Dennett 1991), neuronal groups (Edelman 1987), low level membrane channels (Flohrs 2000), Orchestrated Objective Reduction (Hameroff 2006), thalamocortical loops (Llinas 2002), neural synchrony (Singer 2003), or information integration, (Tononi 2004) – a few of the leading NCC theories or otherwise influential theories. We need an answer consistent with experiment which does not undermine our trust in scientific observation itself, yet is undeniable without self-contradiction.

In our scientific world view it is assumed that the universe is driven by causal mechanisms explained by laws of nature. The word 'mechanism' comes from the same root as the word 'machine.' Machines do not possess feelings or sensations by definition. Everywhere science has probed into the mechanisms of nature the need to add conscious experience to the description or explanation seems to evaporate. Thermostats have no feelings. Though they have a temperature sensor, they do not have temperature sensations. This law-based mechanism approach then leads to an impasse: At what point does a lump of tissue begin to sense the world around it and then itself, and why should it? Brains are nothing but neurons and glia which are nothing but proteins and fat which are nothing but ions and molecules and so on.

All efforts to provide a mechanistic explanation of consciousness to date have failed because failure is built in by definition. Given the standard view of what a mechanism is, consciousness *in principle* cannot be explained by mechanisms. Mechanisms do not need sentience to operate, and Occam's Razor leaves no room for it. To posit sensation or consciousness for a mechanism is totally arbitrary, as in "… and then a miracle happens." The same is true of many dynamical systems models or computational models. Though they allow feedback, goal seeking, chaos, and nonlinearity, they are still basically mechanistic. The notion of emergence cannot help here either (Strawson 2006). Nature has many examples of emergent measurable properties. However, consciousness is vastly different because the sensations of others are not directly measurable.

Of key importance is a proper conception of consciousness itself. I offer the following definition: *Consciousness is the process of sensing and interpreting qualitative contrasts (qualia) in order to change or act.*[2] When we do this as humans our Western interpretations tend to posit physical objects and their properties, or minds and their properties, or both – hence physicalism, idealism or dualism. Whatever the result, this process of interpretation happens everywhere in nature where phenomena are changing relative to others somewhere else (i.e., everywhere, not just in brains) as I will explain.

Consciousness is presupposed in the very act of measurement. We cannot eliminate conscious observation from science. No matter how elaborate, objective, and quantified we make our experimental apparatus, we always have to observe something (dial, display, scale, printout, etc.) to get the result of the experiment, and then we have to interpret and record it. For example, according to a leading analysis of what mechanisms are they involve components with properties organized spatially and temporally such that they consistently perform certain actions in certain situations when they causally interact (Craver & Bechtel 2006). However, this view skirts the issue of the observer who isolates, identifies, and studies the qualitative phenomena that reveal the mechanism in operation, and who then interprets what is going on causally. The observer is implicit in everything science does regardless of how well methodologically trained or objective.

There are many 'tough-minded' experimentalists who look down on the enterprise of trying to explain consciousness. They consider it a rather useless and irresolvable battle of opinions. They often argue that we need more scientific facts before we erect these grand theories. However, this is precisely where they miss the point. There can be no facts without interpretations of sensations. In spite of the hard-nosed attitudes of experimentalists, all observers are theorists to the core. Observable facts about the world are, bluntly speaking, theories – provisional interpretations rather than obvious truths.

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2. Some question the utility of this 'qualia' concept. Nevertheless, there are obvious differences we can sense like black versus white or hot versus cold. If one will not consent to these, then one cannot be reading this sentence.

2. What it all means: 'Meaning' as expectations and predictions

An often overlooked preliminary in understanding and explaining consciousness is to clearly state what *understanding* consists of and what counts as an *explanation*. When we understand something we know what it means. What it means (to us individually) is all the implications we can derive, all the conclusions we leap to, feelings and expectations triggered, what we theorize is likely to happen in the future (including counterfactuals), and what we assume happened in the past that led up to the current situation, utterance, or event.

A good understanding of a phenomenon requires that we can make reliable predictions and answer what-if questions about it. *Both understanding and explanation involve predictions. Understanding emphasizes what the future holds. Explanation emphasizes what happened in the past that could predict the present.* The most rigorous and public form of the search for understanding and explanations is the team approach of science. However, when we fully understand something we also should know how to appropriately relate to it emotionally and behaviorally as well. Otherwise the understanding is purely academic or scientific in need of further interpretation and application with ethical guidance sensitive to artistic and emotional considerations.

With a really good scientific understanding we are able not only to predict what might happen next after the event in question, but we can also explain why it happens the way it does as a result of antecedent conditions. We are able to expose the underlying consistent patterns in events as reasons for why things always tend to go a certain way. In science this usually takes the form of a causal explanation or a model. In a reductive way we go further in this process and give reasons for those reasons, or causes for causes, or model the subsystems in the model.

Just as science would understand and explain events with predictions from general principles, when we learn to understand words of a spoken language, we *fill in* the usual implications from statements we hear. This is their meaning. Beyond an explicit statement there are often implicit claims, questions or demands that we have to be aware of by implication. With enough experience with linguistic use we develop a sense of what things usually mean in various contexts. This is part of the basis for 'common sense' which is a large part of our enculturation. It results in shared presuppositions and prejudgments. A similar thing happens when we learn a new skill or trade. We learn what tasks follow after others in various contexts, the protocol for doing business or for getting a particular result. These are other kinds of learned meaning interpretation. The industry has accepted ways of doing things, and the master craftsman has specialized techniques. Learning these kinds of things is another kind of enculturation with meanings.

In science there are ways of doing experiments, giving presentations, writing publications, accepting honors, and writing a CV, all of which are customs that make up a life in science. It is the common sense of these procedures and customs and specialized technical languages that makes it possible to make sense of experiments and publications for a meaningful career in science. Interpretive extraction of meaning is the very essence of cognition whether from events, experiments, words, traffic signs, or social occasions. It has quite a lot to do with conscious awareness as well. For related neuroscience background see Roser and Gazzanaga (2004), or the great theoretical neuroscience work by Friston and Stephan (2007), showing how predictions and expectations are fundamental to cognitive brain dynamics.

3. What sensations mean: Reality is what we expect to feel when we reach for it

Conscious experience is another form of this process of extracting meaning and interpreting events, and perception is the paradigmatic example of this activity and the foundation for all the others. Just as we make many inferences when we hear a linguistic utterance to get the meaning and understand, we infer many things beyond the raw sensory qualitative contrasts we have. Our perceptual 'data' are color and brightness contrasts arranged in a jumpy two dimensional mosaic, sound vibrations arriving at our ears with temporal offsets, feelings of heat/cold/pressure on the skin, tastes of bitter/sweet, stomach sensations, odors, pleasure and pain, vestibular sensations, and sensations of flexion or extension from muscle receptors. These are raw qualities of human experience as any beginning student of neuroscience or physiological psychology knows. What we make of them is quite another thing.

From these raw qualities we construct our perceptual experience of reality as a memorable interpretation that goes beyond these qualitative data using associative inference. These are inferred sensations that underlie inductive and deductive thinking. As these sensations become more and more abstract, the interpretive experiences we have trail off into a less vivid realm of experience that slowly reduces to voices in our heads or even ineffable blends of concepts and imagery. This process is directly analogous to what scientists do publicly when interpreting experimental results, but it is less rigorous, not public, and not formally peer reviewed. We are clearly not born with a gift to see into reality. If we were, we should see mostly empty space, energy and electromagnetic waves, or maybe twistors, strings, or branes according to the best physical theories science has. Instead, we have the ability to sense certain qualia and to theorize about trees, apples and these other hypothetical realities to get good enough predictions to eat, adapt and keep on sensing. Prediction and theory construction are built into perception.

Gregory credits Helmholtz for a similar 'unconscious inference' view:

> For von Helmholtz, ambiguities are usually resolved, and non-visual object properties inferred, from knowledge by unconscious inductive inference from what is signaled and from knowledge of the object world. It is a small step to say that perceptions are hypotheses, predicting unsensed characteristics of objects, and predicting in time, to compensate neural signaling delay (discovered by von Helmholtz in 1850)... (Gregory 1997: 1121)

According to the embodied realism movement from cognitive science (a form of physicalism), we all begin construction of a theory of reality in our infancy (Hampe & Grady 2005; Lakoff & Johnson 1999; Mandler 2004). Very early in life we begin to realize without being able to verbalize it yet that colors, sounds and other sensation contrasts come in spatiotemporal patterns. Memory organized according to well understood neural network principles makes it possible to recognize past patterns from partial evidence. We begin to attend to some patterns more than others. We learn and are predisposed to focus our eyes and to orient our heads and neck to track moving or changing patterns. This all happens well before we have developed a sense of personal identity.

As we rapidly build up a history of these pattern experiences in our synaptic memory we infer recognizable schemas, and then expectation-based 'things.' We start to develop a sense of a 'reality' that is somewhat constant. When we step forward, we expect to feel pressure on the leading foot. When we reach for something we see, we expect to feel our hand touch it. Many such objects of experience do not move much, and look and act the same on subsequent encounters. We learn to give these patterns names and we accept them as independent things. At the same time we are also acquiring a personal history. We remember experiences from day to day. At some point we connect the dots and infer our continuing identity through time as an observer-decider-actor who is the common denominator in these personal experiences. These are the developmental origins of expectation-based meanings. From the process of sensing, interpreting, and organizing data from birth we build a theory of reality and of our own identity.

Materialists hold onto the child's interpretation of a substantive reality, in spite of the difficulty in reconciling with results from modern physics. Others, like the neutral monists, interpret sensations as the ultimate stuff from which both mind and matter are built. However, if there is one thing we can be sure of, it is this sensation-interpretation process. One can summarize this with the epistemological slogan "*Qualia are not properties of things – rather, things are interpretations of qualia*." So I differ from all standard metaphysical positions in my claim that we use sensations to infer or predict others. The rest is reification and metaphor. Our sensory event-triggered inferences (cognitions) are 2nd order sensations that refine the 1st order sensations, not mental events separate from a hypothetical physical reality.

Secondly, I reject the causal mechanistic thinking that explains all primitive events with sensation-free accounts, creating the hard problem in explaining consciousness. Third, I argue that 'inference' is a useful metaphor for what all systems do when they advance from present to future, to evolve, create change and form new memory (whether such systems are animate or inanimate, with or without a brain). Lastly, inferences of which I am unaware can be viewed by recursion as interpreted sensations in subsystems that comprise me – a different level of conscious awareness (more to follow).

4. A much-overlooked clue: Consciousness uses and creates memory

Under general anesthesia (done right) we do not record any memories, and we are unconscious. During sleep we have very diminished recall except for fleeting recollections from REM sleep. If knocked out by a blow, the unconscious state that ensues is likewise devoid of any memory when we recover. At the end of a long drive we may realize we are unaware of much of what transpired because we cannot remember it. Epileptic seizures, including absence seizures, involve an unconscious state accompanied by no memory thereafter. Having a conscious experience clearly results in remembering an interpretation of events that is stored for some time. Consider the famous neurological patients E.P. and H.M. who lost their ability to commit new information to long term memory after damage to the temporal lobes (Squire & Kandel 2000; Stefanacci et al. 2000). They still carry on a fully aware conversation using immediate memory along with intact long term memory they already possess. We only exhibit consciousness for events that we can, at least for some time, recall in some minimal level of detail. Creatures like us with brains have special adaptations for remembering much more of what happens to us. However, the capacity is not infinite. That is why we condense sensations to an interpretation that is worth remembering by virtue of being useful for future adaptation through prediction.

A fact that cannot be overemphasized in the study of consciousness is that in the same way that our eyes send signals to our visual brain areas, our associative memories are triggered by these same visual inputs, as well as by other ongoing memory associations that are running almost open loop. We are accustomed to think of sensation, perception, memory and consciousness as four very distinct things because of how we use these words in our everyday speech and the experimental paradigms used to study each. However, the core phenomena are not nearly so neatly separable. Our brains are unlike the Von Neumann digital computer model with separate storage and processing. Rather memory is integral to everything the brain does. It learns new patterns of experience and behavior in the process of activating old patterns and habits in memory. *The memory is the 'processor.'* The timing of presynaptic and postsynaptic events between neurons is translated into synaptic changes that effect future responses through a process called spike timing dependent plasticity, or STDP (Izhikevich 2007). 'Neuromorphic' system designs have started mimicking this architecture (Deiss et. al. 1998).

The human brain has about 10^{11} neurons and 10^{15} synapses where our memories live, according to prevailing theory. Each synaptic connection is both modifiable by and a constraint upon signals that get passed along. Surprisingly there are 10 times as many nerve fibers coming down from the primary sensory areas of the neocortex (the evolutionary newest part of our brain) to the thalamic nuclei and basal ganglia (main way stations for sensory and motor signals) as there are sensory signals being relayed through those structures up to the neocortex. How does something that originates outside distinguish itself from something that is added on inside by associative recollection or by memory based anticipation? Either way, all we measure are spikes and synaptic events. Though our sensations may be more vivid than our memories, and we may not feel able to manipulate externally derived signals as well as we can our personal memories, both involve sensations – cascades of sensations by association. *Associative memory is the key to perception when we realize that memories are sensations that add to driven sensations.* When we augment incoming sensations with memory sensations (imagery, expectations, concepts and thoughts) we add an interpretation to the raw sensations.

Memories are sometimes sensual imagery, sometimes thoughts like silent speech, often abstracted conceptual schemas of all these. We take visual or auditory sensations and we infer what we expect they represent as additional activated and fill-in sensations along with primed memory associations organized into categories of pattern perception learned (Ramachandran & Gregory 1991). This process is self limiting due to decreasing relevance and due to being continuously bombarded by new sensations that must be kept up with. We complete the spatial and temporal patterns of sensation to produce our experienced concept driven reality, and then we remember that interpretation. This has to be done efficiently and adaptively to keep up. Perception is the same kind of thing as interpreting meaning of an utterance or interpreting the moves of an opponent in a sport. We are inferring beyond what is given at the moment and making something of it – a meaning that we can act on in the near or far future. What is different about perception than language or sport is that you can have perception without them, but not vice versa.

Perception starts from sensations that have to be interpreted. The black and white contrasts of the letters on this page are meaningless until interpreted. We experience not just what we sense, the qualitative contrasts, but our interpretation of these 'qualia.' That is why I say our interpretive experience is a constructed *theory* of reality. That is not to say it is arbitrary or a bad theory. But unfortunately we usually go on to treat our interpretation as a given brute fact rather than as a memory derived construction, a theory. We have little awareness of this process, remembering none of it. Instead, we remember the new interpretation that is stored for use next time, and that makes our bootstrapped reality *theory* seem all the more real and independent of us. It just seems 'given.' Our lives depend upon this process and accepting perception without any hesitation, and that is why it survived natural selection.

Filling in our sensations with associative memories happens very fast. The visual blind spot is one common example of the sometimes bizarre ways we construct our experience in real time with our associative inferences (Ramachandran & Gregory 1991). Change blindness gives another example of how we can be misled by our expectations so as to miss seeing what is happening (Simons & Levin 1998). Our associative expectations are leading our attention to focus elsewhere. We see most clearly what we are attending to, and we recognize phenomena as familiar things with names by similarity to past experiences we have learned to name. When we struggle to recognize something new that comes along, we find ourselves naturally comparing it to similar experiences, remembering by association how it is like this or like that, and we use just exactly those words to describe something new and unusual. Associative expectations give us an advantage to stay in sync with the environment, especially out of harm's way when differentiating friend from foe, but they can also interfere with learning in novel circumstances. Priming may therefore also be the source of many of our prejudices.

5. On getting over one's self: The excluded middle way to enlightenment

Self interpretation (it's all about 'me') becomes so automatic and natural for us social beings as children that we have a difficult time imagining sensations that are not owned by the self. It quickly becomes our constant companion, on call as needed by way of inference. Experiencing a self is clearly an evolutionary advantage because it tells us which body to feed, defend, etc. However, when we as researchers take our selves too seriously, it contributes to confusion about what consciousness is because then we have to explain who this *being* is who is conscious. We have reified our selves. The sense of me as a personality arises from our oft repeated story that describes a history of feelings, behavioral habits, and memories. It is a culturally-reinforced historical, and somewhat literary, fiction. We have it because it promotes social survival.

As we are taught by parents, teachers, and social leaders to take responsibility for what we do, we buy into the notion that we are an active agent with an *ego* (the 'I' of me). However, the Libet (2004) experiments give evidence that action initiation precedes the experience of deciding to act. Cultures teach us to speak languages from the 1st person. Our sense of agency comes partly from that, but also from our habitual identification with our movements. If my body moves, and there is no conflict, I usually accept that I willed it, especially if I had already been contemplating the move. It often happens that we cannot recall the exact moment of making a conscious decision. The movement finally happens, and we just take ownership. Examples are yawns, and stretches, eating, elimination, and many other daily activities. But if one has severe Parkinson's or Hemibalismus, they will not interpret such motion as being willed. These acts happen unexpectedly or cannot be inhibited as desired. Without a plan and a veto option such acts would be interpreted as demon possession in bygone years.

When we can predict what we are likely to do without conflict, we identify with our prediction. The ego is the result of this identification, a kind of self-fulfilling prophecy bordering on self-hypnosis. For example, "I think I am going to the store. . .I see myself going now. . .So I must have chosen to." There is no disembodied middleman ego between the choices we have and our final decision, other than by hindsight. To the extent we experience one – and most adults do by default – we have been hypnotized. This is actually adaptive. When we attend to and keep track of the decisions made, interpret them, and take them to be our own, we can later easily go back to assign credit for successes and failures in action. This 'credit assignment' problem is recognized as an important problem to be solved in biological and artificial neural networks as well as in machine learning.

It is from ego experience and self-experience, both problematic interpretations of sensations, that we learn to experience our own illusion of ego-based causal powers

(Wegner 2003). This is an important factor in our imagining causal powers out in the universe, acting on or between objects in a 'real world' separate from us. We project similar illusory powers out onto the world we experience.

Part II: The form of the universal conscious processes

6. Who's on second: State versus output phase lags and histories

The following pair of equations express in simple form how any system generates behavior and updates its state given its recent state, input, and behavior. This is one way to model any system as a 'UNCC (UNiversal Correlates of Consciousness) system' making either continuous or discrete time updates, whichever description is convenient to the task.

Next behavior: $X_b = f_b$ **(recent state, recent input, recent behavior)**

Next state: $X_s = f_s$ **(recent state, recent input, recent behavior)**

(Finite state 'machines' are a special case of UNCC systems where the histories shrink down to just the last items.) These two functions are a *descriptive* model mapping present to future, but they are not inherently a *prescription* for behavior. Because of the presumption of causal determinism, such are often taken to model a prescription that *must* be followed. Though seldom questioned, causal determinism is a reification of a metaphysical inference from the consistency in events. The metaphor of lawful causal determination can be replaced by a metaphor of sensation, interpretation, decision and action. How such decisions are made without a wizard behind the curtain will be discussed further in a later section. When this change of metaphors is made, we find that models of this type resemble our own conscious process of sensation, interpretive decision, and actions that result in new memory as state change. Keeping f_b and f_s separate allows the functions to have a phase lag so that conscious states that encode interpretations of ongoing behavior can lag behind as found experimentally (Libet 2004).

Such a delay also helps explain the often-suggested late veto of action decisions (Libet 2004; Gray 2004). By anticipatory interpretive monitoring of our behavior, inappropriate actions can be aborted. In other words, behavior unfolds from a system by the interaction between its state and its input with inertial continuity, but state update by formation of new memory state may take somewhat longer as the interpretation of what has happened or is happening. If we behave adaptively using past memory, it allows us to get by with a memory update process that runs slower than our reaction times might suggest. Superior memories that can update in near real time have an advantage in using evolving context and its ongoing evaluation for guidance and rapid error correction. This is largely what separates us from many simpler systems.

Everywhere we look in nature and measure systems, we can utilize this twin process metaphor – from elementary processes on up to learning in brains. The interpretive step that results in memory update is the key to understanding the universal correlates of consciousness. An amoeba senses aspects of its environment and takes appropriate action to surround and digest food as do insects, reptiles and all mammals in their own way. Plants sense the sun above and the nutrients below and grow toward them. They all have internal state that can be treated like memory even without neurons and brains. They somehow sense, know or reference this state memory as they change their state and produce new behavior, and that gives their existence continuity. That does not imply that they all "know that they know," which is something that may be unique to humans. While not implying self-awareness, it is a type of self-reference as well as a type of inertial self. Our form of self-reference which we call 'self awareness' is much more sophisticated, with all our historical memory and our rich associations triggered by present happenings. However, there is no fundamental difference in kind.

If systems did not pivot on present state when evolving from one moment to the next, they might not hold together as a coherent system through time. Change takes time and is always rooted in the past. Hysteresis from state *inertia* along with systematic and constrained state change is the basis of all memory. Secondly, all systems are responsive to or selective of certain kinds of input or, equivalently, exposures to certain environments. Intuitively this is how we recognize and define them. Mathematically, systems are characterized by: the set of inputs they are sensitive to, internal memory states, the set of outputs they are capable of, and the function mappings above. For our purposes the set of outputs can also be considered as the 'degrees of freedom' in system behavior.

Most of us have been taught to believe that although we have perceptions, brainless life forms have neither sensations nor conscious experience, much less self-experience. We treat them as automatons that have no feelings. They are just senseless state machines, according to that view. These machines operate by causal laws that allow no room for sentient experience. However, from a systems perspective the division here between brain-based systems and others that have rudimentary nervous systems or no nervous system at all is formally *arbitrary*. What gives humans rich conscious experience is an extended present that stretches out our sensations via associative memory sensations based upon our past while current events and our ongoing behavior are interpreted, labeled, evaluated and stored anew. It is presumptuous to assume that other life forms that have a different or simpler kind of memory have no sensations or experience. They clearly do interpret their inputs so as to survive or continue from one moment to the next, and system continuity through time depends upon a state memory. Their memory is simpler and often not as long nor as modifiable by learning. Yet it seems to be made out of the same stuff our brains are made of, according to accepted physical theory. Why would they not also have elementary sensations of some kind? Why not consider their actions and reactions to their respective environments as a state-based interpretation like our own? The only way it could be otherwise is if these systems were *driven* purely by causes and laws that govern them, so that they are senseless philosophical 'zombies' lacking in consciousness.

However, if causes and laws are misleading concepts then these modest beings should have modest awareness. It would be hard to imagine what it is like to be a bacterium, electron, or rock. However, neither can we know exactly how other *human* or *animal* observers experience the world without knowing what they know, and sensing what they sense. Brain states involve very large numbers of neurons, and state transitions are very sensitive to history and contextual conditions in the way chaotic systems are very sensitive to initial conditions. It has been suggested that the brain is stabilized in a scale-free state of self-organized criticality (Freeman 2005). The smallest differences could lead to wholly different experiences of the same situation.

Nor can we be sure that there really is a physical reality beyond the phenomenal contrasts we can immediately sense. In all cases, we sense and we theorize. The panpsychic position that comes out of the non-mechanistic interpretation of these equations creates no new metaphysical problems, and furthermore solves the problem of explaining why things have experience at all. Admittedly, it involves quite a large adjustment in perspective that takes some getting used to – namely the idea that all events are accompanied by sensations of some kind. However, the issue at the core is epistemological, not metaphysical.

We can subsume the two interpretation functions under one function, and just call it f_c (the UNCC function), with the ordered pair

$$<X_b, X_s> = f_c \textbf{ (recent state, recent input, recent behavior)}$$

where 'recent' includes some history encoded in it. If there are no governing laws of natural systems, the function is not imposed from the outside. There is no oracle for each system to consult. Each system is the embodiment of f_c. It is the very definition of the system. This allows the theoretical possibility that all systems *are* the process of sensing and interpreting of their environment by definition. This function of what they can sense and interpret and their degrees of freedom together defines how they (1st person) experience and interface to their environment and what we will see as observers (3rd person) to the extent that we are sensitive to their inputs, behaviors and states. A difference that does not make a difference to a system contains neither information nor meaning for it. Simple systems are less sophisticated than us with more primitive sensors, far less memory and fewer degrees of freedom in their behavioral repertoire, but they are doing something similar; in fact, something formally equivalent.

The most concrete things we can know with certainty are our sensations. We can interpret them as properties of our mind or some universal mind, properties of a physical body or matter, proxies for something beyond themselves that is unknowable or of something knowable and yet ineffable, or we can interpret the sensations themselves as ultimate reality. However we interpret them, we are at that point theorizing (extrapolating) beyond what we have to work with. So, should we be physicalists, idealists, dualists, neutral monists, or what? Such philosophical divisions are likely part of the problem because they do not address the very process that gives rise to such theoretical dichotomies. Perhaps we gain insight by focusing on this process of sensation interpretation instead.

The UNCC proposal here is for a non-mechanistic self-organizing metaphor for scientific reality and a better kind of science. It does not say what the ultimate stuff of reality is, or even if there is such stuff. Rather it claims that *all processes of change are 'self-similar' to our own conscious experience*. Though it cannot be proven that all systems have sensations to interpret, neither can we prove to each other that we have these. If we deny that brainless systems have sensations to interpret, it raises the huge question of why we are so special, thus creating the hard problem. No one has offered any viable solution for that. If we deny there are sensations to be interpreted, then we abandon any possibility for scientific measurement, and we contradict the sensory contrasts implicit in our statement of denial.

Without recourse to laws and causes we must produce explanations by a recursive process of explicating the constraints within a system that arise from its self organization. We find the subsystems that comprise it, characterize what they do, and show how overall system behavior is constrained by what those components allow in their lower level degrees of freedom.

For example, rather than saying that gravitation causes stones to roll downhill or that space-time is warped around large objects, it is more accurate to say that we can predict with high confidence that stones in a certain mass range will roll certain ways when in the vicinity of other massive objects of a certain larger mass range. In the latter, *both sides of the relationship are agents and partners* in creating what transpires, making gravitation a consistent observation instead of a law. Once we write down the mathematical description as a law, we realize and admire the simplicity and universal applicability, but this deceives us into believing that it is an eternal governing principle. Gravitational phenomena are the result of collective behavior of self-organized systems, and how they constrain themselves, and each other. Science will continue to have to contend with arguments supporting intelligent design until this kind of view of self-organization and laws becomes more widely accepted.

7. It's the epistemology, stupid!: Eliminative skepticism

Self-experience is a type of theory of 'me.' Ego is a theory of my decisions and current behavior, a theory of 'I.' Calling these theories is quite generous. The so-called physical world is also a type of theory, the theory of 'it.' Both 'mind' and 'matter' are theoretical entities. All we can know for sure is the concrete sensory contrasts we have firsthand, and that leaves 'reality' (monisms, dualisms, and physicalisms) as abstract theories. In that sense sensations are the most *real* thing we have access to. But sensory contrasts alone are not very useful without interpretation. It does not make sense to me to conclude that reality is only sensations bundled together in different ways, as idealism would have it. I do not claim that all theories are bad or wrong. There are many that are worth clinging to as a provisional predictive work-in-progress. However, we will be wise to always qualify statements of the sort "Reality is..." with the prefix "It is *as if* ...." because we will always only have sensations to work from.

One of the most misunderstood and often debated metaphors in science is that of 'laws of nature' regarding the systematic interactions among these theoretical objects (Cartwright 1993; Dorato 2005; Mumford 2004; Swartz 2003). To deduce using rigorous experimental methods that phenomena occur with regularity is a statement about observations. From this we can predict with confidence what future acts of observation will yield. However, to claim that natural systems, themselves reifications of phenomenal patterns, obey laws from a timeless or transcendental realm that governs phenomena would be a metaphysical claim that goes far beyond the data. It is a second order reification, and few philosophers of science would admit to such a belief today. Yet many mainstream scientists continue to cling to this Platonic view (e.g. Penrose 1996). The metaphor of 'causal laws' along with the notion of material objects also continues to drive the thinking of many.

Hume was one of the first to famously question whether belief in causality is justified, and the debate has continued up to the present day between the 'necessitarians' and the 'regularists' (Hume 1739; Swartz 2003). The UNCC view promoted here adds a new spin to the debate. Without doubt all we can ever observe and be sure of is the phenomena themselves, the data, the qualities of experience and how they evolve – provided we trust our senses, memory and other derived records we make. We cannot directly detect the existence of physical objects beyond these phenomena, nor the existence of laws governing those hypothetical objects, nor the existence of causes beyond correlations in the phenomena. To do so is an act of theoretical interpretation and filling-in that goes well beyond the phenomenal data. It is actually a learned habit coming from embodied cognition (Lakoff & Johnson 1999). Feeling pressure, seeing a push, and sensing movement together taught us much of our concept of causal powers. Causality was the easiest and most adaptive interpretation learned in childhood.

Rather than talk about what there is, we might better limit ourselves in many cases to talk about what we observe and how we interpret the observations. We have to be mindful in this process of the ready-made metaphysics that is embedded in our language to mislead us. To steal a term from software engineering, English (and most others) is an 'object oriented' language, and it is very conducive to 'buggy' metaphysics.

There is an alternative to the 'laws of nature view' that is just as useful as the objects-causes-laws orientation we are all immersed in, and it creates fewer problems. It is a *constraint-satisfaction* view. The difference is subtle but important. It parallels the difference between Strong Artificial Intelligence that uses rules, and Connectionism that uses constraint satisfaction networks that learn. In the former the rules dictate, in the latter the rules themselves are an emergent phenomenon resulting from how the system satisfies multiple constraints. Instead of thinking of all natural systems as behaving according to causal laws, we can think of them as satisfying multiple constraints embodied in their state and structure when interacting with the environment. Their state provides both a kind of inertia and a potential energy that constrains how they will interact with any future environmental change encountered. They are acting out the natural script they embody in their architecture. They are not determined by external causes nor executing algorithms. They are internally constrained by how they are defined to act out in characteristic ways. This is more like self-determination with a small 's' than like classical physical determinism with a big 'D.' When conflicting constraints need to be satisfied, this satisfaction process is a form of decision making. It is related to synchronization and possibly to quantum wave function collapse or decoherence at some or all levels (Hughes 1989; Joos et al. 2003).

Electrons are not real things that obey laws. Electrons are by definition theoretical entities suggested by consistent patterns of observation that all repeat the same way within quantum limits of variability. They do so because they are all built the same, like identical twins but with less capability to grow apart with experience via learning. They do not have synaptic memory, but they do have state memory (local and sometimes nonlocal). Their behavior defines them. Electrons do not conform to Maxwell's equations. Maxwell's equations are an interpretation of this observed behavior.

At first hearing this may sound like a trick with words. However, recent research in fundamental physics of strings, knots and related work suggests this may be more than mere analogy or metaphor. There may be a coherent way of thinking about nature as nested, self-organized, constraint-satisfaction systems without causal laws, such as the following suggestive picture. Crudely speaking, there may be something like vibrating stringy energy that drives change. It might get curled up around itself in knots to become resistant to change, getting in its own way, so to speak (Raymer & Smith 2007). That would be inertial mass-energy. Systematic evolution could build up complex patterns which result in the hierarchies we normally associate with the physical world – from branes to galaxies.

Perhaps nature's systematic behavior arises from the basic frequencies and wavelengths, how they interfere or harmonize, and how long that takes. Instead of calling that lawful, we might better just consider it consistent orchestrated behavior, noted wherever observed under controlled circumstances. The inertial mass form of energy creates constraints on how free energy can effect change. Its inertia resists change and creates a physical basis for memory. Change is a matter of contrast between here and there, this and that, before and after. While one is changing in reaction to the other, the converse is happening at the same time. Both parties to each transaction need to be attuned to the other, like little observers. Even if one party changes little (more inertia), it *will nonetheless change* to some extent as part of the transaction. This little dance at the point of interaction may be far more interesting than is evident from the law-governed view.

Consciousness as the process of sensation and interpretive changes of behavior and state comes into play at this fundamental level. Everything in this *as if* metaphysic is made out of change, the potential for change, and the detections and reactions to changes. The systematic structure and behavior in natural systems perhaps evolve complex patterns starting from this lowest level of strings with a conscious process built in. To treat such behavior as cause-effect processes or to call it sensation, decision, and action is a choice between a world with or without a 'hard problem.'

Once viewed this way, or any number of other similar ways where inertial constraints evolve from energy for change and then channel that energy, simple natural systems cease to be the pawns of external forces and laws. They become *agents* that are actively sensing and interpreting their environment with whatever sensors they have and behaving with whatever degrees of freedom they have. Both of these in turn are the result of how they are self-organized from lower level systems that constrain and define how they operate. This view in many ways suggests a theoretical monism.

Seen in this light, an electron can be thought of as a system that *senses* photons and *interprets* them based upon its current directional momentum, energy level, spin, the photon's energy, etc. All these factors come into play as constraints on what the electron might do next after encountering the photon (and what the photon will do as well). It is not governed by a fundamental law. Rather what it does in these circumstances *defines* it as a typical electron and contributes to the pattern of behavior among electrons from which we derive the generalizations that many choose to think of as physical laws. It is possible to imagine the electron having some kind of hard to visualize conscious experience of the photon it encounters just as a cockroach might scurry away from light, the plant may lean into the sunlight, or the predator stalks its prey in the moonlight.

Consciousness becomes a fundamental aspect of all systems in nature when defined as a process of interpreting sensation using state constraints to produce new state and behavior. All systems in nature are acting out the constraints that define their internal structure. They are quite literally speaking, 'being themselves' or, equivalently, 'acting naturally.' This is happening at all levels of existence – from elementary particles, to brains, up to societies, civilizations, solar systems, galaxies, and all systems together. For humans, 'being oneself' can be very complex with many options and many conflicts to resolve, and that adds to the stressful existential human drama that simpler systems likely do not have to deal with.

As Hume first observed, belief in causality is not unequivocally justifiable. If things always happen in a certain order, it does not mean that the effect happens by necessity or law. As the philosophical Regularists have noted, laws are just our generalizations of our observations, i.e., regularities (Schwartz 2003). They are subject to revision and refinement, or even radical reformulation in light of new experimental evidence. If there are no 'real' laws out there somewhere governing, then causal relations are just matters of fact rather than matters of law. Things happen as they do, *because* they do, not because they *have to*. In other words, certain phenomena recur consistently in certain ways, by definition as it were, and that is all we can say. The pattern in events defines process phenomena. Going beyond that is to unnecessarily delve into metaphysics. It may seem "as if" there is a law governing behind the scenes. It may seem "as if" things are causally determined to happen in certain ways. It may seem "as if" there is substance in the world. However, as long as we hold onto the phrase "as if" we will remain more true to what we can actually observe, and less surprised when we find a deviation from observations – leaving room for sentience and awareness throughout nature.

Without a metaphysical spin on laws and causality, all we have is sensations which seem to arise in consistent patterns. This skepticism eliminates the need for talk about ultimate reality. We have no need to posit a material reality that is causing effects to occur beyond these consistent phenomenal patterns we observe. While it can be useful to develop predictive models of an "as if" reality, that reality resides in a theoretical as-if realm and always will.

Furthermore, we can treat all phenomena as if they were *neither* physical *nor* mental. We can treat them as processes of sensation and interpretation like our own personal awareness, just as easily as we can argue for physicalism, laws and causality. Nothing is lost, but much is gained. The hard problem of consciousness ceases, and man's estrangement from existence is much reduced. People need not feel separate from the rest of nature, as if holding a privileged position, hovering above it like a disembodied soul. Nor do they need to feel they are "nothing but" material mechanisms (Crick 1994).

Instead people can accept that they are sensing, interpreting systems just like all other phenomena in nature. *Sensations are not mental events* because, as I have argued, *there are no minds that possess them*. This is a brand of monism that is neither materialist nor idealist nor traditional monist, because it refuses to posit either matter or minds on epistemological grounds – we simply cannot know. However, insofar as it sets sensations as epistemologically prior to matter or minds, and makes consciousness the fundamental process of nature, it is closely affiliated with neutral monisms.

From this perspective much of what has so far transpired in current approaches to scientific study of consciousness – though productive in many ways – has the whole problem of consciousness backwards. It is not that we need to explain how consciousness arises in a physical world. We need to explain why we need to posit a physical world at all, when all we can confirm by experiment is qualitative phenomena embellished with our own consensual theoretical interpretations. Without resorting to idealism, there are newly-developing scientific views, especially in quantum theory interpretations, revealing that common sense physical reality is not the last word on what there is. The implications of quantum theory are still only beginning to be understood and only very slowly seeping into our language concepts. Epistemology sets bounds on metaphysical conclusions, and that is what scientific method is all about. Science now has the opportunity to recalibrate itself in light of lessons learned about human perception, memory, cognition, and self-experience. It is time to drop the common sense physicalism that pits observers against material objects.

8. Arbitration and Sync for Orchestration or Quantum Collapse?

Only time itself could have an equally fundamental role as consciousness in the unfolding of the universe, and time and consciousness are deeply connected. Time is, after all, an abstraction from systematic regular changes. From those changes, clocks are constructed. If conscious processes, sensation and interpretation to effect state and behavior change, are involved in all systematic change, then the relevance to fundamental theory and scientific interpretation cannot be overestimated. The UNCC view reduces the abstract notions of causality and laws into the concept of consciousness itself by removing the transcendental aspect and grounding both in the here and now of sensations.

Nonliving systems have few degrees of freedom compared to free-ranging living systems or even to plants. An elementary particle like an electron or a photon has a small number of observables, each a matter of theoretical interpretation using some of the most elaborate experimental setups and observations ever achieved. According to some interpretations of quantum theory, electrons do not even have any particular set of features until someone like us observes them (Stapp 2007; Rosenblum & Kuttner 2006). According to the decoherence view, superpositions of states in quantum systems become more and more fragile as the systems get larger and more complex, until a point is reached where wave function collapse (classicality) is inevitable – conscious observer or not (Joos et al. 2003). According to the panpsychist view, these systems are *all observing each other as they interact*, and coming to a kind of decision by constrained arbitration, getting the degrees of freedom into sync so that self-organizing behavior can go off in a consistent direction. This is a radically new approach to fundamental theory.

Living systems have far more degrees of freedom, and much longer history stored in their memory that can influence moment to moment decisions. With associative memory and an ability to simulate futures, they can entertain more possibilities in decision making, including very subtle nuances of the situation. It is little wonder that they are harder to predict; in fact, amazing that we can predict anything they do at all. With so many behavioral options, the decision-making process can become very complex. Imagine all the different muscle groups that have to be synchronized, balanced, coordinated, and sequenced just to climb a flight of stairs. The decision to simply walk up the stairs requires a selection among an enormous set of competing incompatibles. Arbitration, constraint satisfaction and synchronization seems required of many different neurons and neural fibers for a single muscle to contract. This 'Sync' phenomenon (Strogatz 2003), in some very general form, may be at the root of how all systems resolve ambiguities, satisfy constraints, and move forward for coherent change into the future.

Ambiguities of meaning are a type of superposition of possible futures in the same decision space. It is an interesting conjecture that sync may be a key element in the way the system state vector collapses in quantum systems as well. Self-organization is very basic in nature, and it is directly related to sync and to conscious processes. The Orchestrated Objective Reduction (Orch-OR) model of Penrose and Hameroff (Hameroff 2006) argues that quantum computation takes place in the microtubules of 'superneurons' (neural nets linked by gap junctions) in brains, to produce 40 Hz oscillations that represent conscious states. That may be one way to achieve gamma synchrony. However, we are still left with the odd phenomenon in general of wave function collapse from states of superposition, and why the choices are what they are. Until we understand how that kind of state selection or system synchronization happens, Orch-OR would not be that great a comfort – even if tested, and even if issues regarding decoherence at room temperatures are resolved.

Part III: Tests and evidence

9. Observing the observer: Experimental directions for lab lovers

Though experimental methods *seem* to support the only-brains-are-conscious view, it is seen from the foregoing that this is an oversimplification caused by biased interpretation of the data. In the end, things are settled not just by experiment and predictive power alone but also by how clear, simple, encompassing, and satisfying the view is. The UNCC view proposed here has much to offer on all those counts. Unequivocal empirical support would be helpful, but in fairness we must note that evidence for physicalism, emergence, causality, or the existence of laws is ambiguous, at best. Nevertheless, the following are suggested directions that one might pursue.

First, already discussed was the way in which our conscious awareness comes and goes with memory formation. So strong is the relationship between memory formation and conscious experience that others have suggested that the NMDA receptors strongly implicated in STDP learning for memory formation are also mediators of consciousness (Flohrs 2000). A systematic review of the action of general anesthetics could be very revealing. Clearly they cannot act by just shutting down all spiking activity, or people would die. It is just as clear that a person under general anesthesia does not remember anything of the episode. So by teasing apart how dependent the anesthetic is on how well it selectively shuts off memory-recording would provide interesting data for testing the idea that primate consciousness arises with memory update in brains.

A second area that is ripe for study is to understand better how the phenomenon of sync occurs throughout nature and how it relates to making choices or decisions. A lot of neurons and muscles have to agree on a choice in order to have an orchestrated response. Global sync may be needed for interpretive memory formation, too. Perhaps it is a problem of sync in much simpler systems as well. Sync is already the subject of many cross-disciplinary studies (Pikovsky et al. 2003). However, these usually do not relate to decision making, and refocusing on decision sync would be useful (Buzsaki 2006).[3] Even the most mundane systems are trivially synchronized. That is what keeps

3. Buzsaki (2006) gives an excellent treatment. See Chapter 6 for example: ".. synchrony by oscillation is a metabolically cheap mechanism to achieve a large impact. . ..Assembly behavior is a consequence of self-organized interactions among neurons and this self-organization may be the source of cognitive function." (p. 174).

them together in the same place at the same time and allows them to move as a unified whole in one direction. Intrasystem interactions, surface tension, electrostatics, covalent bonds, etc. help maintain this trivial sync according to physicalism. Without sync of subsystem interactions the whole unravels and disintegrates. There is much to learn about trivial and nontrivial forms of sync.

A third area to gain insight into is how systems lose sync and disintegrate. When people have too many conflicting options and are indecisive, they feel real stress under the pressure of a real or imagined deadline. Likewise when they cannot decipher which set of implications from some context is likely most accurate, they feel lack of understanding and the stress that goes with that. The opposite is what I have described elsewhere as "the feeling of understanding" when all the implications fit together. There is a stress that results from being underconstrained. People can disintegrate as a functioning person in extreme cases or otherwise fail to make an adaptive response. Perhaps something analogous takes place in very small systems before they disintegrate. Alternatively, what we may be finding in nature are those systems left after a process of universal selection by survival of the fittest, or most stable, under various stressors.

Fourth, a key set of interdisciplinary experiments could test whether behaviors come before state updates, at the same time, or after. This is the equivalent to the Libet experiments but done on all other sorts of systems that can be studied. If it turned out that state update and memory change lags behind action or reaction in elementary systems of nature, it would be very supportive of the idea that panpsychic awareness involves interpreting sensation of what has happened, and storage for future utilization, while action unfolds, constrained only by lessons already learned in the past. It would imply that action can be more prompt using older history, but the subsequent state change – where past and present sensations mingle to create new memory – must wait for behavior to unfold to meaningfully interpret it for future memory storage. Even for elementary particle systems there is a 'chicken and egg' problem. Before the system can change state, there needs to be an interpretation of how state is affected by the behavior being generated, itself based upon the past. This should be testable with careful measurements. This kind of experiment starts to get at the very roots of time and change.

A fifth ongoing mystery of quantum theory is how quantum indeterminacy is constrained to just a few choices and how the final choice is selected. If this is one of the most fundamental conscious processes in nature (as implied here), then it is necessary to understand this better than has been attempted heretofore. Some would call it 'collapse of the wave function' while others prefer the language of 'decoherence.' Understanding this process and how the choices are limited as they are could together shed much light. Physics remains incomplete without an answer.

It was proposed that constraint satisfaction take the place of laws and causality in providing explanations. That goes with the notion that systems are not determined by causes and laws, but rather they are *defined* by how they behave in certain environments. A useful analytical enterprise for philosophers together with scientists would be to take apart a complex system as defined by the interactions of each of its component subsystems. Then for each identified subsystem, recurse and do it again. The objective would be to see if there is anything useful in the reductive causal view that is left out of the recursive analysis approach. Can the latter give a satisfying (predictive) explanation of all the system phenomena using self-organizing notions without appealing to causal laws? Can the notions of constraint satisfaction, energy, and inertia such as hinted at in these pages provide a satisfying explanation of evolution and self-organization? Can we live with a phenomenal '*as if* metaphysics' devoid of *real* substances and properties?

None of these experiments nor analyses will alone prove UNCC to be a better metaphor for understanding nature. However, when combined with others they would show consistency with science when properly interpreted. The type of argument used here for panpsychism starts by acknowledging the key features of our own consciousness. These were *sensation* and *interpretation using memory*, where interpretation results in new behavior and new memories that bias future behaviors and interpretations. Self-awareness (me) and the ego (I) are secondary issues not crucial for understanding consciousness. It is possible to split the analysis of these concepts more finely than I have done here, but it would not significantly affect the final conclusion.

Clearly many lower forms of life show signs of awareness too, but with a more limited horizon of memory-based filled-in expectations – approaching, but not reaching, zero in the inanimate case. It was explained how any arbitrary system can be viewed as having sentient features when it interacts with the environment. This means that conscious awareness is a property of all systems, though not equivalent for all. I have used the so-called facts and lessons of neuroscience and cognitive science to support this view. However, this did require a major adjustment in how we interpret them. We need neuroscience if we are to explain how consciousness works in brains. However, at the same time we need a broader idea of what sensation and consciousness are in order to have any neuroscience left when we are done with that explanation. Eliminative Skepticism of the UNCC view allows for compatibility between consciousness studies and hard science.

In many ways the systems view of consciousness presented here is already in unacknowledged common practice. We speak metaphorically of systems sensing and making optimal decisions for control, behaving and encoding state memory. By not acknowledging that this is also what we do as conscious humans, or by assuming that we do or have something extra-special to be conscious, we fail to recognize the deep connection we have to all manner of systems.

Panpsychism, while slowly gaining in popularity, continues to face major hurdles in the search for respect and unequivocal evidence. It seems to those on the inside of the movement at times that it is a simple choice between two different ways of looking at nature, and neither has the upper hand in experimental support. Rather, the prevailing view has momentum by historical and cultural biases that insidiously infiltrate the debate from all angles, making it very hard to get a fair hearing on the subject. This situation desperately needs rebalancing because panpsychism presents a view of nature with much potential for achieving a better understanding of 'what it all means.'

CHAPTER 8

Panpsychism, the Big-Bang-Argument, and the dignity of life

Patrick Spät

This essay begins with an outline for the 'Master-Argument' for panpsychism: experiential reality is not reducible to and cannot emerge from physical reality. From this, it is argued that experiential reality is not only widespread but ubiquitous in physical reality. The 'Big-Bang-Argument' then presents a strong case for monism, and the 'pan' which the panpsychist view implies. Beyond these theoretical deliberations, panpsychism directly leads to a new kind of ethics (called for at present); the view has the power to bridge the Scylla and Charybdis of 'is' and 'ought', because we participate with suffering entities. Finally, panpsychism can give rise to the notion of the 'dignity of life': Every living entity has intrinsic value and should be treated as a valuable organism in itself.

1. The Master-Argument for panpsychism and the problem of emergence

If you are – while reading this volume – in the uncomfortable situation of suffering from an aching wisdom tooth or from having cut your finger on one of these pages, then you might experience some form of pain. What is pain? According to the official definition of the *International Association for the Study of Pain* (IASP), pain is characterized as follows:

> Pain: An unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage. *Note*: Pain is always subjective. Each individual learns the application of the word through experiences related to injury in early life. [...] This definition avoids tying pain to the stimulus. Activity induced in the nociceptor and nociceptive pathways by a noxious stimulus is not pain, which is always a psychological state, even though we may well appreciate that pain most often has a proximate physical cause.
>
> (IASP 1986: 250, cf. Aydede 2005: 5)

Given this definition, pain is both tissue damage *and* an unpleasant (qualitative) subjective feeling. How can this be? This question, which centers around the bipolar nature of reality, forms the mind-body problem: How can something subjective and qualitative 'emerge' from something that does not have these qualities? That is, how can the feeling of an aching pain 'emerge' from mindless, dead matter? Panpsychism, the thesis that "all things have mind or a mind-like quality" (Skrbina 2005: 16) tries to answer this question. According to panpsychism, mind-like qualities do not emerge from matter. Rather, mind-like qualities are ubiquitous in the cosmos and are as real phenomena as the physical. The *Master-Argument* for panpsychism can be put as follows:[1]

(i) There is experiential reality.
(ii) There is physical reality.
(iii) Experiential reality cannot possibly be physical reality.
(iv) Experiential reality cannot emerge from physical reality.

(v) Therefore, experiential reality is ubiquitous in physical reality and panpsychism is true.

Claims (i), (ii), and (iii) seem to be uncontroversial, at least epistemologically. Of course, there is much ink spent in showing that (iii) is wrong, but I will not enter into this debate here. Let me say just this: There seems to be experiential reality since we experience e.g. pain, and cannot be wrong about that. Our experiential reality *can* be wrong about physical reality, e.g. when we look at some optical illusions, but we cannot be wrong about our experiential reality, "because consciousness consists in the appearances themselves. *Where appearance is concerned we cannot make the appearance-reality distinction because the appearance is the reality*" (Searle 1992: 121f.; cf. Strawson 1994: 51ff.). If a subject looks at an optical illusion or if a subject hallucinates pain, then *for* the subject this experiential reality is undeniably real – regardless of what physical reality tells us about the 'real' circumstances.[2] Regarding (ii) it just makes sense to speak of physical reality; there seems to be (at least) a four-dimensional space-time with extended objects 'out there', i.e. independent of our experiential reality. Otherwise one has to bite the bullet claiming that we are living in a Berkeleyan universe. I take it that there is an independent physical reality that is not exhausted by experiential reality alone.

Point (iii) catches the intuition that the qualities of experiential reality – e.g. the qualia or raw feels of the conscious experience of pain – exhibit properties that do not belong to the properties we assign to physical reality. This claim rests *inter alia* on the argument that science does not reveal the intrinsic properties of experiential reality. Science tells us the relations between the mass of a bowling ball and the mass of the

1. This list (like the whole present work) is inspired by Nagel (1979) and especially by Strawson (2006, 2006b).

2. Also the IASP (1986: 250) pays attention to this: "Many people report pain in the absence of tissue damage or any likely pathological cause; usually this happens for psychological reasons. There is no way to distinguish their experience from that due to tissue damage if we take the subjective report. If they regard their experience as pain [...] it should be accepted as pain."

'International Prototype Kilogram' at the *International Bureau of Weights and Measures* in Sèvres, France. But science tells us nothing about the felt mass while lifting the bowling ball, because we "know nothing about the intrinsic quality of physical events except when these are mental events that we directly experience" (Russell 1956: 153; cf. Strawson 2006: 9–12). Science discovers and describes relations that are expressable in the *language of mathematics*. You can examine the sunlight, the relations between the different colors, and make up a mathematical model that reveals the underlying laws of colors. But nothing of these mathematical laws tells you what it is like to see the color red.[3] Some might object that all these debates and the involved intuitions are misplaced since we simply handle them with different concepts, whereas physical and experiential reality are of the same ontological kind (cf. Papineau 2002, 2006). But it is questionable that even in principle God could create a 'qualia textbook,' such that someone could read it and say: 'Aha, that's how mindless, dead matter creates my experience of pain.' Such a textbook will (can) only describe relations, but the experience of pain is more than a relation – it has a (painful, aching) *content*.

Instead of elaborating these issues further, I would like to make some claims on (iv) and (v). The validity of panpsychism stands and falls with the possibility of strong emergence. According to C.D. Broad (1925: 78) we can speak of strong emergence,

> if every aggregate of order *B* is composed of aggregates of order *A*, and if it has certain properties which no aggregate of order *A* possesses and which cannot be deduced from the *A*-properties and the structure of the *B*-complex by any law of composition which has manifested itself at lower levels.

Following this definition, the thesis of strong emergence holds that (B), which is an entirely new ontological kind, can emerge from (A): No property of (A) can explain or make intelligibly the properties of (B). Therefore, it is possible that mind-like qualities can emerge from entities that do not possess these qualities. Strawson (2006: 18) has recently claimed that this cannot be the case:

> If it really is true that Y is emergent from X then it must be the case that Y is in some sense wholly dependent on X and X alone, so that all features of Y trace intelligibly back to X (where 'intelligible' is a metaphysical rather than an epistemic notion). *Emergence can't be brute* [...] in the sense of there being

3. The Norwegian vision scientist Knut Nordby was completely achromatic so that he could not see any colors. In principle he could have written down a textbook that explains all knowable mathematical relations that the world of colors has. His personal account underlines the intuition that such a textbook cannot reveal the contentful nature of colors we *experience*: "Although I have acquired a thorough theoretical knowledge of the physics of colours and the physiology of the colour receptor mechanisms, nothing of this can help me to understand the true nature of colours. From the history of art I have also learned about the meanings often attributed to colours and how colours have been used at different times, but this too does not give me an understanding of the essential character or quality of colours." (Nordby 1990: 305).

> absolutely no reason in the nature of things why the emerging thing is as it is (so that it is unintelligible even to God). For any feature Y of anything that is correctly considered to be emergent from X, there must be something about X and X alone in virtue of which Y emerges, and which is sufficient for Y.

This applies to the classical principle that *ex nihilo, nihil fit*. Physicalists sometimes try to respond to this principle by making analogies like the following one: Sodium as well as chloride do not have the quality of saltiness, but when we combine them into sodium chloride this quality emerges. Neither sodium nor chloride are salty but sodium chloride is. Thus, it is – analogically – possible that mind-like qualities can emerge from mindless, dead matter.

What is problematic with this conclusion is not only the violation of the *ex nihilo, nihil fit* principle[4] but also the *tautology* which analogies like this one imply. The property of saltiness is only *prima facie* an emerging property of the molecule sodium chloride. For there to be something having the property of saltiness one needs something that experiences this property. A molecule of sodium chloride lying 'alone' at the shore of the Dead Sea is not salty until a subject is experiencing the molecule and judges it to be salty. Consider Maria who can taste saltiness, and inverted Mary who judges sodium chloride to taste sweet (because of pathological reasons). Now is the molecule itself salty? No, it is also sweet, since Mary judges it to have the property of tasting sweet. Therefore, emergent properties depend on a subject who experiences them. Saltiness (or sweetness) thus resides in the qualia, not the molecule.

Taking up and varying a scenario from Dan Dennett (1991: 379) one might make – via controlled breeding or genetic engineering – the whole human population to taste sodium chloride as sweet. In its chemical structure the molecule will be the same as ever, but now table salt is no longer used for cooking spaghetti but for strawberry jam. Thus, emergent properties are 'caused' by (the structure of) the subject who experiences them, not (only) by the entities that are responsible for the emergence.[5] Sodium

4. And also the fact that the emergence of the molecule sodium chloride itself can be explained in physical terms. Likewise, the e.g. emergence of liquid H_2O from non-liquid H and O atoms can be explained via the involved van de Waals molecular interaction laws (cf. Strawson 2006: 13). What really is special about the 'emergent' property of being liquid is how *we* experience this property while looking at a glass of water or while swimming in the sea, feeling the liquidity with our skin – call this the qualia, raw feels, phenomenal properties etc. about the 'property' of being liquid.

5. Likewise it is wrong to say that objects themselves are colored without a subject that experiences them as being colored. Look at a caterpillar (*lithophane ornithopus*) sitting on an oak leaf. To humans the caterpillar looks to be very similar in color to the leaf – both seem to have a similar shade of green. Not so for birds (who see them in an unknown shade of ultraviolet). To birds the same caterpillar strongly contrasts against the background, because birds are able to detect the UV light that is maximally reflected by the caterpillar's surface (while oak leaves reflect only minimally). To put it in a nutshell, while looking at the *same* caterpillar, birds experience 'emergent' properties we do not experience (cf. Bennett & Cuthill 1994; Cuthill et al.

and chloride do not cause the saltiness, they *constitute* it (cf. Chalmers 1996: 130). It is important to emphasize that this does not imply a subjectivism: In some sense the property of saltiness really *is* in the sodium chloride as an unrealized disposition – and with the intervention of an experiencing subject this *disposition becomes realized*. In other words, sodium and chloride are necessary but not sufficient for the emergent property of saltiness.

Given this, the emergent property of saltiness belongs to the qualia of the experiencing subject. Thus, the problem of how saltiness (or liquidity, or colors, etc.) can emerge from an entity that does not have these properties belongs to the problem of how experiential reality can emerge from physical qua non-experiential reality. And this question is the very mind-body problem. Therefore, the physicalist's classical analogies are tautological in their nature – consider their typical line of argumentation:

(1) Sodium and chloride (A) are responsible for the emergent property of saltiness (B).

(2) (B) is of an entirely new ontological kind, since no property of (A) can explain or make intelligibly the properties of (B).

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(3) Therefore, it is possible that mind-like qualities (Q) can emerge from entities that do not possess these qualities (P).

Given the points above, (B) is a property of (Q). It follows that the question of how (Q) can emerge from (A) is equivalent to the question of how (Q) can emerge from (P). Thus, all these issues throw up the question of how (Q) can emerge from (P) – since both (A) and (P) belong to the first order (physical reality) that is thought to be responsible for the emergent properties (experiential reality). Or, to take up Broad's definition: The problem is not to 'deduce' (B) from (A), but (B) from (P). We can explain everything we need to know about how (A) can cause the molecular structure responsible for (B) simply by applying the appropriate laws of molecular interaction; what cannot be deduced is the *experienced* saltiness, and this is a question about (Q). So eventually it all comes down to the question of how experiential reality can emerge from physical reality, and this is the mind-body problem.

Can the solution to the mind-body problem include a case of strong emergence? That is, can (Q) emerge from (P)? As Strawson (2006: 21) points out, the *ex nihilo, nihil fit* principle rests partially on an unargued intuition, and I do not think that we can go beyond the intuition expressed in the quoted passage from Strawson above. All known cases of emergence are a matter of "shape-size-mass-charge-etc. phenomena" (ibid: 13), but in the case of experiential reality, these phenomena seem not to be sufficient for the emergence of e.g. pain.

2000). Thus, emergent properties depend on the organism's constitution and are not to be said to merely 'belong' to the things themselves.

The 'emergence' of pain demonstrates this point. For example, *Stevens' Power Law* shows that there is a strong relationship between physical and (conscious) experiential reality: The magnitude of the physical stimulus – the pressure with which you bite onto your tongue – exactly corresponds to the perceived intensity of the felt pain (cf. Stevens 1957). Many other relations that science reveals could be mentioned, especially the current search for the so-called neural correlates of consciousness (NCC), but the point here is that they are just relations. They cannot capture the very character of the felt pain. Korzybski's (1933: 58) famous sentence – "[a] map is not the territory it represents" – catches the involved intuition very well. Science maps the cosmos, but we ourselves experience the territory.

Regarding the possibility of strong emergence there are two more aspects worth mentioning here. First, *the homogeneity aspect*: Given that the emergence of (Q) from (P) would – in the physicalist's sense as described above – be the *only* known case of strong emergence, it would seem rather odd that everywhere in the cosmos we have cases of weak emergence and that only (Q) is an exception to the rule. Why then should only the emergence of (Q) break the chain of weak emergence? It seems to be a better choice to claim that the emergence of (Q) from (P) is a case of weak emergence, *too*. But – and this is important – *not* with the physicalist's conclusion that therefore the properties of (Q) are reducible to the properties of (P) – because this step would entail all the problems with which physicalism struggles – but rather with the panpsychist's conclusion that all (P) involves (Q). Or, in other words, that *all physical reality involves experiential reality*. In such a homogeneous scheme everything would have its cause and (Q) would no longer be a *creatio ex nihilo* out of (P). According to the panpsychist picture one could really speak of weak emergence that does justice to *both* the irreducibility of (Q) and the physicalist's intuition that the cosmos is homogeneous, so that every high level property in the cosmos can intelligibly be traced back to a low level property which is the sufficient cause for the emergent property.[6]

Second, *the continuity aspect*: The principle of strong emergence implies that in physical reality there are entities which enjoy an experiential reality and entities that do not. Therefore, one has to make the assumption of 'drawing a line' somewhere in the cosmos between experiential and non-experiential reality. But, as Chalmers (1996: 297) points out, there "is something odd about the idea that a system with n elements could not be conscious but a system with $n + 1$ elements could be." This point requires further elaboration, as I will explain.

6. It also follows that the panpsychist's picture avoids the problems of epiphenomenalism with which cases of strong emergence struggle (cf. Kim 2005), because the properties of (Q) would be both in the lower and the higher levels of reality. Thus, the problem of how (Q) $\rightarrow$ (P) is transformed to the panpsychist picture (Q) + (P) $\rightarrow$ (Q) + (P).

2. The Big-Bang-Argument for panpsychism

Given that there is both (i) experiential reality and (ii) physical reality, and that (iii) these two are not of the same ontological kind, combined with (iv) the impossibility of *creatio ex nihilo*, we conclude that (v) some form of panpsychism is true. The validity of panpsychism not only stands and falls with the possibility of strong emergence but also with the possibility of the *continuity* of experiential reality in physical reality. But, as William Seager (2006: 133) claims, non-emergence does not imply that experience is ubiquitous in reality:

> [W]hile the fundamentality of the mental seems to follow from the failure of emergence, the ubiquity of the mental is not so easily established. Why couldn't a fundamental feature appear here and there throughout the world rather than everywhere (perhaps in the way that electric charge or mass are features of some fundamental particles but not others).

Sam Coleman raises similar doubts and calls into question that micropsychism does entail panpsychism. Micropsychism is the view that "at least *some* ultimates must have experiential properties" whereas panpsychism is the view that "all ultimates are experiential" (2006: 48). Here I will claim that micropsychism *does* entail panpsychism, i.e. that non-emergence does indeed *imply* the principle of continuity which lies at the heart of every panpsychist theory. It is especially this claim which many find ludicrous and "vaguely hippyish, i.e. stoned" (McGinn 2006: 93). I hope that the following will also convince the sober and clear-minded.

The *principle of continuity* holds that experiential reality is ubiquitous in physical reality. That is, every entity which is said to belong to physical reality also has an experiential reality. Skrbina (2005: 26, 39) argues that the principle of continuity dates back at least to Anaximenes and Plato. In a nutshell, the main idea goes as follows: Humans possess experiential reality. Experiential reality is a direct consequence of the entities that make up the cosmos (physical reality). Therefore, these entities (physical reality) have an experiential reality. This conclusion rests on an analogy between humans and nonhuman entities. Since we have (conscious) experiential reality it seems natural that all other entities have this reality, too, because everything is made up of the same entities. The following two arguments support this idea.

a. Descartes drew the line of experiential reality between humans and animals, claiming that the later are mere machines whose properties are exhausted by physical reality. Today few will be satisfied with this account because scientific research has shown that also e.g. monkeys, coyotes, rats, and honeybees enjoy a rich mental life (cf. Bekoff 2002). Furthermore some animals, such as chimps, dolphins, crows, and elephants, even show some degree of self-awareness while looking into a mirror. These findings suggests that in nature there is a "convergent cognitive evolution" without any breaks in respect to experiential reality.[7] Drawing the line between animals and, for example, bacteria or cells does not make the issue easier, since cells have "an awareness of the outside world" – albeit this is only "the world outside one's cell membrane" (cited from Thompson 2007: 161). A cell in the tongue, for example, has a sensitivity for impulses like saltiness and sweetness and hence it has a primitive sort of experiential reality. Going down much further it is apparent "that even an electron has at least a rudimentary mental pole, represented mathematically by the quantum potential" (Bohm & Hiley 1993: 387). Of course, an electron does *not* have *conscious* experiential reality, i.e. an electron does not have self-awareness, it cannot taste coffee, and it cannot make any deliberations. Rather, this mental pole has a very primitive, binary structure. Accordingly, a thermostat does not have conscious experiential reality, but it assimilates information from his environment. Otherwise it could not react to an increasing temperature.[8] The static picture of physical reality that characterizes the current philosophy of mind is no longer appropriate: "Elementary particles are not static objects just sitting there, but processes carrying little bits of information between events at which they interact, giving rise to new processes", as the physicist Lee Smolin (2001: 64) points out. The exchange of information is one of the most fundamental actions to be found in elementary physics. Therefore, drawing a line inevitably poses the question *where* such a line is to be drawn: Every choice seems to be arbitrary.

Besides these more empirical considerations, the problem of drawing a line faces some major metaphysical difficulties.

b. In what follows I will sketch some thoughts which may be denoted as the *Big-Bang-Argument*. Given that strong emergence is not possible one can say that something which does not 'pop up' must 'be there,' in reality itself. And something that 'is there' must 'be everywhere.' But why does the non-emergence of experiential reality entail the 'pan' of this reality?

First, there is the principle of the interchangeability of the fundamental entities that make up the cosmos, which we can call the ultimates (U) of the cosmos – let them be the most fundamental sub-atomic particles, the basic building blocks, the Leibnizian monads, the strings of superstring- or M-theory, etc. All (U) share the same properties, and one (U) cannot be distinguished from another (U). Therefore, the (U) which make up a human brain are refundable. In principle, the (U) from "books,

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7. Plotnik et al. 2006: 17053. Also, cf. Jonas (1966: 57): "If man was the relative of animals, then animals were the relatives of man and in degrees bearers of that inwardness of which man, the most advanced of their kin, is conscious himself [because of the] principle of continuous graduation."

8. Cf. Chalmers (1996: 293f). This primitive experience of information is 'binary' in the sense that it is only an experience of "a difference which makes a difference", as Bateson (1972: 315) defines information. In the end this is what physics suggests, but one would have to be an electron to know what it is like to be one. And if you are an electron, you would not experience very much.

bricks, gold, peanut butter, [and] a grand piano" (Nagel 1986: 28) are suitable building blocks for a brain. Elsewhere Nagel (1976: 181) also emphasizes that some (U) from another galaxy can find their way to a grassland on earth, where a cow eats the (U) of the grass and passes them via its milk to a pregnant woman. Finally, the child's brain is partly composed of these (U).[9] If *any arbitrary* composition of some (U) can make up a brain (or a body) which is responsible for (conscious) experiential reality and if the principle of non-emergence holds, then *all* (U) must exhibit experiential reality.

This claim gains support from the *Big-Bang-Argument*: During the Big Bang there was a moment of *singularity*: The whole (present) cosmos, i.e. *all* existing (U), have at one time been pressed into an unimaginably small space.[10] According to the theory of singularity this space has been so small that it does not make any sense to speak of 'many' or 'some' (U), rather there has been *one, primordial* (U_0). If there has been a moment of singularity, and *everything* – that is, all (U) – that exists has come from that point p_0 at time t_0, then there cannot be a difference between the (U) in my brain, the (U) that make up my coffee mug, and the (U) of some distant star:

> Particles that were together in an interaction remain in some sense parts of a single system, which responds together to further interactions. Virtually everything we see and touch and feel is made up of collections of particles that have been involved in interactions with other particles right back through time, to the Big Bang [...] Indeed, the particles that make up my body once jostled in close proximity and interacted with the particles that now make up your body. We are as much parts of a single system as the two photons flying out of the heart of the Aspect experiment. (Gribbin 1984: 229)

Thus, to capture Chalmers's idea quoted above, it does not make any sense to say that a system with n (U) has experiential reality and a system with $n + 1$ (U) does not. For all (U) have been part of the one, primordial (U_0) during the moment of singularity. In other words: At the moment of singularity, at point p_0 at time t_0, there has been only one (U_0). After the Big Bang, at any point p_{0+n} at any time t_{0+n} there are (U) that have arisen out of the one (U_0). Thus, the many (U) cannot have properties that the one (U_0) does not have, since all (U) *have been* (U_0) at the point of singularity: Every (U_1), (U_2), (U_3), ... (U_n) is a direct derivative of the one (U_0), because the

9. This is not so far away from reality: The stomach lining of an human being is renewed every five days and one gets a totally new liver every two months. Every year, 98 percent (!) of the atoms in the human body are replaced (cf. Thompson 2007: 150f.).

10. For the following discussion it is irrelevant whether there has been one Big Bang or many, or whether there has been a clash between 'our' universe and a parallel universe as the so-called 'ekpyrotic scenario' describes the Big Bang. What matters is that there has been one moment of *singularity* somewhere, somewhen, somehow. (The question of somehow is also irrelevant here, though it raises interesting questions regarding the former discussion of the possibility of a 'creatio ex nihilo'). For comprehensible accounts about scientific facts regarding the Big Bang see e.g. Silk (2000) and Singh (2004).

singularity does not allow us to make any distinctions between (U_0) and the derivative (U_n), and hence every (U_n) can be said to be a 'clone' of the one (U_0).[11] In this sense there is no difference between *some* and *all* (U) since the point of singularity. Thus, micropsychism entails panpsychism.

However, Seager (2006: 137) objects

> that to the extent that there are physical entities which play no role whatsoever in the constitution and operation of the brain – neutrinos as it may be – there is ground to deny any experiential aspect to at least these elements of the material world.

Strawson (2006b: 228) replies by an appeal to the homogeneity of physical reality, claiming that "[all] physical reality is (at bottom) the same kind of stuff." While Strawson (ibid.: Fn. 93) emphasizes this claim by pointing to the standard model of quantum physics – which tells us that there is a fundamental commonality to be found in the quantum fields – the Big-Bang-Argument makes a strong case for Strawson's train of thought.

Everything that exists is made up of one or some $(U)^n$. Likewise, a human brain, a coffee mug and *also* neutrinos are made up of some $(U)^n$. Seager misses the point in claiming that there are some entities which do not constitute a brain. Of course, books, bricks, gold, peanut butter, and grand pianos *themselves* do not constitute a brain – nor do neutrinos *themselves* play any role in constituting a brain. But what are books, pianos, and neutrinos? They are *nothing but* accumulations of some $(U)^n$. At the fundamental bottom of ontology there is no difference between these entities – the only thing that differs is how the (U) are arranged. Thus, *all* these entities are just *higher level* constitutions of some $(U)^n$. *All* (U) have an experiential reality and thus neutrinos have an experiential reality, too. In principle, we could build a conscious being out of anti-matter – as Seager (2006: 137) seems to deny. If everything, i.e. all higher level entities – be it a brain, a galaxy, anti-matter, dark matter, quarks, leptons, or strings – are made up of some $(U)^n$, and if all (U) have an experiential reality, then we must give up micropsychism. And to claim that the (U) do not have experiential reality but e.g. electrons (or other higher level entities) which are made up of these

11. Or, as Schaffer (2006: 24) puts it: "The universe is one explosion – we are but shards of the primordial atom." As Schaffer shows in the same paper, the clone/shard-suggestion gains strong support from quantum physics, since it "holds that the one whole is in an entangled state" (ibid.: 22). Moreover, the phenomenon of *quantum nonlocality* suggests a strong (by now unexplainable) entanglement between all (U). For example, two quantum objects Q_1 and Q_2 can be distant for light-years and nevertheless, when Q_1 collapses then Q_2 collapses *at the same moment without any deceleration* (cf. Aspect et al. 1982). Since superluminal velocity violates all known laws of physics, there has to be another (experiential?) connection between Q_1 and Q_2. Even if the connection is not in some sense experiential or mental, quantum nonlocality shows – besides metaphysical deliberations – the strong relatedness of all (U).

(U) have experiential reality again poses the problems of drawing a line, and of strong emergence.

The conclusion can be drawn as follows: If experiential reality is not emergent, the principle of continuity must hold. To put it in Hans Jonas' (1979: 69) words: "What looks like a leap is in reality a continuation; the fruit is presaged in the root." *All* physical reality is made up of (U) and *all* (U) have arisen out of one extremely tiny point, the primordial (U_0). It follows that if one (U) has experiential reality, all (U) must have experiential reality – and that the primordial (U_0) had an experiential reality is suggested by the impossibility of strong emergence. If strong emergence is not possible, the principle of continuity is true. And accordingly, *experiential reality is ubiquitous*. Panpsychism faces the problem that it cannot be 'proved' in the ordinary sense, because it walks at the borderline between physical reality and metaphysical deliberations. For something to be *proved* one has to describe the relations which science reveals and explains. But if experiential reality goes beyond these relations, one must equally go beyond ('meta') the brute physical, because "life can be known only by life" as Jonas (1966: 91) vividly puts it.

What, then, follows – besides cosmological knowledge – if experiential reality is a funda-*mental* property of the cosmos? In other words, what practical consequences are implied by the panpsychist picture of the world?

3. 'Is' There an ought?

Where does panpsychism take us regarding its practical consequences? As Skrbina (2005: 268) points out, panpsychism

> stands in stark contrast to the cynical, isolating, manipulative values of mechanistic materialism. To the extent that these mechanistic values have contributed to our current environmental and social crises, panpsychist values begin to reverse this process and heal the damage.[12]

According to physicalism (and its close relatives like materialism, positivism, behaviorism, and mechanism), values are man-made. That is, values are not intrinsic properties of the cosmos or physical reality per se, but mere human conventions. Take the following scenario: Someone is physically hurting his dog, so that the dog is whining and whimpering. Why is this a condemnable action? Following most physicalists there is a difference between the descriptive statement 'The dog *is* suffering' and the prescriptive statement 'The dog *ought* not to be hurt!' This strict breakup is "borrowed from the natural sciences", as Jonas says (1979: 44). From the fact that the dog is suffering it does not follow that one ought to stop hurting him or that one ought to help him out of his

12. As Skrbina (2005: 223–234) elaborates, several panpsychists have drawn ethical consequences from their worldview.

dreadful situation. According to this line of reasoning we have, on the one hand, physical reality, i.e. the 'is', and on the other hand experiential reality, the 'ought'.[13] These two are separated realms; the experiential reality is a mere phenomenon 'in the head,' whereas the physical reality is just there, mindless and bloodless, without any intrinsic value, as Wittgenstein (1921: §6.41) unambiguously claims: "The sense of the world must lie outside the world. In the world everything is as it is, and everything happens as it does happen: in it no value exists – and if did exist, it would have no value."

The panpsychist's ontology disagrees. Experiential reality is not just 'in the head', it is spread out in the whole cosmos. For example, we condemn harming the dog not just because we invent a moral principle and thus impose our projections onto physical reality but because the dog *per se*, the very 'is', is suffering from *his* experiential reality, namely his experienced pain. It is his physical reality that exhibits an experiential reality which *shows* us that the dog wants to avoid the awkward pain. The bifurcation between 'is' and 'ought' is nothing but an artificial armchair principle: "Aid to others in need would never be internalized as a duty without the fellow-feeling that drives people to take an interest in one another. Moral sentiments came first; moral principles second" (de Waal 1996: 87).

Schoolchildren or indigenous peoples like the Inuit and the Aborigines surely do not sit in their armchairs in order to establish complicated ethical enquiries; they see and feel the intrinsic values of reality. But also the modern, civilized human being bears this natural attitude. When a newborn is in danger or suffering from pain, I immediately know what to do, i.e. I do not make long considerations but rather I *help it out*. In such a situation the ontic paradigm reads as follows: "Look and you know" (Jonas 1979: 131).[14] I act *forthwith*, and in some sense intuitively. Where the physicalist regards the newborn as a mere "conglomeration of cells" (ibid.), the panpsychist experiences that "[in] him it is paradigmatically evident that the locus of responsibility is the being that is immersed in becoming, surrendered to mortality, threatened by corruptibility" (ibid.: 135). Thus, the 'is' entails the 'ought'.

Panpsychism has the power to bridge the old chasm between the Scylla and Charybdis of 'is' and 'ought'. Following physicalism – and substance dualism, which argues along the same lines of reasoning – experiential reality is strictly apart from physical reality. But following panpsychism the two are not to be viewed separately. That is, experiential reality is not just 'in my head' which observes and interprets a mindless and dead physical reality, but rather my experiential reality 'meets' another

13. Cf. Hume 1739: book 3, part 1, section 1. The sociobiologist Edward Wilson (1978: 199) takes up this train of thought claiming that a "rational ant" would – if it developed a higher level of intelligence – judge the principle of human values to be "biologically unsound and the very concept of individual freedom intrinsically evil."

14. This reminds of Wittgenstein's advice "don't think, but look!" (Wittgenstein 1953: §66). It is interesting that Wittgenstein does not say this in his more rigorous and behavioristicly flavored *Tractatus*.

experiential reality (the part of the physical reality I see) while looking at a suffering human being, dog, or newborn.

The bifurcation between 'is' and 'ought' is derivative from physicalism: the cosmos is regarded as a clockwork-like machine and natural science cannot reveal any experiential reality. But this is because science describes relations, whereas experiential reality has a qualitative content. By looking from the outside and making objective measurements described in the 'language of mathematics' (to cite Galileo) one cannot derive an 'ought' from an 'is'. But in order to catch the character of reality *as a whole* one must take into account experiential reality, too. As Jonas (1966: 91) says in a panpsychist vein,

> we have in our self-experience, as it were, peepholes into the inwardness of substance, thereby having an idea [...] not only of how reality is spread and interacts in extensity, but of how it *is* to *be* real and to act and to be acted upon. And we can still contrive, by certain acts of abstraction, to be *also* mathematicians and mathematical physicists: "also" – to be "nothing but" a mathematical physicist is plain absurdity.

Because this would be, ethically speaking, to confuse the map (brute 'is') with the territory ('is' plus an entailed 'ought'). Our experiential reality tells us how physical reality is like from the inside. And this act of introspection shows that physical reality has mind-like qualities. Given the principle of continuity as described above one can say that every entity in the cosmos has an experiential reality. Of course, ethics is not concerned with the moral rights or values of the ultimates (U). But a panpsychist ethics can broaden the horizon in respect to entities which deserve rights and protection of these rights; panpsychism can give support to the idea of the 'dignity of life'.

4. The dignity of life

Putting aside the notion of experiential reality for the moment and taking up the concept of feelings, one can claim that conscious feelings – whatever their distinctive degree – imply values: If a living organism 'is' suffering we 'ought' to protect or help it. Not only human beings, but other organisms as well can enjoy feelings. Weber and Varela (2002: 110) emphasize that

> in observing other creatures struggling to continue their existence – starting from simple bacteria that actively swim away from a chemical repellent – we can, by our own evidence, understand teleology as the governing force of the realm of the living.

We do not need to overstress the controversial notion of 'teleology' here; it suffices to note that living organisms – even bacteria – have an essential interest in continuing their existence and avoiding any form of pain or harm. This "subjectivity displays [the] efficacious purpose" (Jonas 1979: 71) of reality, i.e. the purpose to live and to survive is an *intrinsic* property of physical reality. For example, the dog's behavior shows a purposive behavior in avoiding pain. This purpose is not a projection of ourselves but rather it is in the root of reality.

Given the discussion of the ultimates above, it is unnecessary to assume that there is purposiveness as an "initial unity in a metaphysical, all-embracing subject"; rather there is "a scattering of germinal appetitive inwardness through myriads of individual particles", as Jonas (1979: 73) says with panpsychist leanings. If we 'are' one big ultimate (U_0), resolved into many seemingly-appearing separate ultimates (U_n), then all these (U_n) share the same properties. It follows that on the one hand *all* (U_n) share the property of purposiveness and on the other hand that we are connected to all existing entities not only by our common attribution of experiential reality but also at a fundamental physical level. We are all branches of one tree, so to say, and hence we all participate in a purposive cosmos. These thoughts bear important ethical consequences.

It is experiential reality per se – which panpsychism integrates *within* physical reality – that exhibits purposiveness:

> The pang of hunger, the passion of the chase, the fury of combat, the anguish of flight, the lure of love – these, and not the data transmitted by the receptors, imbue objects with the character of goals, negative or positive, and make behavior purposive. (Jonas 1966: 126)

And as we have seen, where there are ends, goals, and purposive behavior, there are values: The purposive 'is' implies an 'ought', i.e. the purposiveness implies *values*. If purposiveness does not 'pop up', then it is everywhere, and if purposiveness is everywhere, then values exist throughout reality.

In modern Western civilizations there is an apparent tendency to treat animals and ecosystems as mere objects. This does not only cause problems for ourselves – global warming, natural disasters, poisoned sites, extinctions of essential organisms, and diseases of civilization – but it also violates the *intrinsic values and the dignity* of these organisms.[15] What does it mean to have value and dignity? According to Kant's classic definition, you should "*always treat humanity, whether in your own person or in the person of any other, never simply as a means, but always at the same time as an end*" (1785: 429). This is one formulation of his categorical imperative, and it states that a *subject* has dignity if it cannot be treated as a mere means. A means is an *object* that

15. Furthermore, the "system is of value for its capacity to throw forward (pro-ject [sic]) all the storied natural history." (Rolston 1988: 198). Nature and ecosystems are not just 'sources' but 'ressources' for our very being as Rolston emphasizes, i.e. ecosystems are a necessary condition for our evolution as human beings and for our current existence and survival. If we do harm to nature we do – ultimately – harm to ourselves. And "our total dependence on Nature but Nature's total independence of us [...] emphasizes the view that Nature has a value which is entirely independent of us" (Lee 1994: 96).

has a price, i.e. it is refundable and interchangeable, like a broken wheel or empty pen. But a human being is an end in itself. It should neither be treated as an instrument nor as a refundable thing.[16]

But what about animals and ecosystems? Kant refers only to humans, or rather to the notion of humanity, but e.g. animals also deserve our protection since they are 'subjects of a life' as Tom Regan emphasizes, because

> *what happens to them matters to them*. Physical pleasure and pain – these they *share* with us [...] these and a host of other psychological states and dispositions collectively help define the mental lives and relative well-being of those humans and animals who are [...] 'subjects of a life.' [...] The basic moral right to respectful treatment strictly limits how we may treat subjects of a life. Individuals who possess this right are never to be treated as mere resources for others; in particular, harms intentionally done to any one subject cannot be justified by aggregating benefits derived by others.
>
> (Regan 2001: 43, italics added)

If subjects and organisms are more than mere objects whose qualities are exhausted by the properties of physical reality, and if animals can e.g. experience pain, then they have the right to be free from harm.[17] Not only humans but animals too have dignity.

The ideas of panpsychism imply that there is a gradual order of conscious experiential reality in the cosmos, and since this reality entails the ability to suffer from harm and since this suffering violates the dignity of the suffering subject, *panpsychism widens the scope of the notion of dignity*. Panpsychism implies that the notion of dignity must apply not only to 'subjects of a life', but to all that is. One possible model for this can be found in the Swiss Federal Constitution: "it shall take into account the dignity of creation and the security of man, animal and environment" (Art. 120, 2).[18] The Swiss *Animal Protection Law* clearly covers the rights of animals: "No one shall unjustifiably expose animals to pain, suffering, physical injury or fear." (Art. 2, 3). But the dignity of life counts for humans, animals, *and* ecosystems. If *everything* has value then not only the ecosystem as a whole but also its constituent parts – the soil, the air, and the rocks –

16. Of course, if you go to the barber, you 'exploit' him in some way as a means. But first, you do this on the basis of an concluded agreement and second, the imperative says that you should 'never simply' treat him as a means but 'at the same time' as a subject with dignity. Note that this is a very brief and incomplete treatment of Kant's ideas, which would require an article of its own.

17. For evidence that animals consciously experience pain see Allen et al. (2005) and esp. Varner (1998: 26–54).

18. 'Creation' is the translation of the Swiss Embassy in Washington. The German term 'Kreatur' is better translated as 'creature'. To expand the involved ideas – esp. for ecosystems – I chose the neutral notion of 'life'. The term 'dignity of creature' was first introduced by the Christian thinker Karl Barth.

bear intrinsic values. All these entities display the property of intrinsic purposiveness; all these entities are essential for the ecosystem, and all are – strictly speaking – unique, i.e. they are not refundable and therefore ends in themselves.

So far I have in some respect mixed normative and utilitarian ethics. That is, I have given arguments which rest on the dignity of an entitity and arguments which rest on the experienced pain of an entity. Panpsychism has the strength to combine these two views. First, we are able to see other entities suffering. In this way, Peter Singer makes a strong case for animal rights because of their ability to suffer pain. Indeed, for Singer the ability to suffer is the *only* criterion for respecting animal rights. Animals have an interest not to suffer and thus we ought to prevent them from harm. Following this line of thought, Singer can claim that it *is* permissible to kill animals

> who have a pleasant existence in a social group suited to their behavioral needs, and are then killed quickly and without pain. I can respect conscientious people who take care to eat only meat that comes from such animals. (Singer 2002: 229f.)

This is the very reason why Singer also allows the killing of embryos and disabled infants – killing someone slowly and painfully is wrong, but killing someone quickly and without any pain is tolerable. But the second point is that we can also recognize the purposiveness of living entities. We do not kill animals and human beings because they have an interest in life. Why should we not kill a sleeping person or a person in coma 'quickly and without pain'? Not because of deliberations regarding her abilty to suffer pain, but because of her valuable life, i.e. her dignity. Why should we not burn down ecosystems? Because the ecosystem is a flourishing and living organism – and an organism that *wants* to live and flourish.

The ontic paradigm 'Look and you know' combines both views. In a physical sense, we 'merely' see other entities suffering and decide to treat them in such a way that they do not experience any form of pain. And in a mental sense, we can feel empathy with these entities and we can recognize that they are not mere physical bodies without any intrinsic values. Whether they can suffer or not, we recognize their drive toward self-realization, something which arises out of their very being.

Of course, this involves the danger of overstressing the notion of dignity. We need trees to produce the paper for this present volume and, more important, we need to do harm to sensitive cells in order to fight cancer, and we need to eat fruits and vegetables in order to survive. But, do we need to systematically breed, kill, and consume animals that possess a (conscious) experiential reality? Do we need to systematically overfish the seas, to pollute the air, and to burn down the rain forests? The question is not only if we 'need' to do this but also whether we have the right to violate the values and the dignity of life.

We need to do harm to e.g. the purposiveness of fruits and vegetables in order to 'satisfy' our own purposiveness, i.e. in order to survive. Thus, in order to protect *all* values we are facing an ethical dilemma. The panpsychist ethics do not imply that we are going back to the Stone Age, but rather that we arrange – to soften the inescapable ethical dilemma – a 'balancing of interests'. This balancing should *not* be arbitrary; it has to respect and protect the dignity of life as far as possible. Jonas widened Kant's categorical imperative with respect to future generations: "Act so that the effects of your action are compatible with the permanence of genuine human life" (Jonas 1979: 11). Here, we can combine the idea of the dignity of life with the idea of the responsibility for future generations – a formula that we can baptize the 'categorical imperative for the dignity of life':

> Act so that the effects of your action are – as far as possible – compatible with the permanence and the dignity of life.

Take the following concrete example, that underscores this point. In the late 1960s the Walt Disney Company intended to establish a large ski resort with some 14,000 visitors per day in the Mineral King Valley, California. To realize these plans, the company also aimed to build a highway through Sequoia National Park. The Sierra Club, an environmental organisation, filed for injunctive relief in order to protect the rich and intact ecosystem. After years of legal battle the Mineral King Valley was annexed into Sequoia National Park in 1978 by an act of Congress, so that the ecosystem has been protected. It is interesting that Christopher Stone (1972), who has been inspired by this lawsuit, recommends that trees and other natural subjects should have a standing in law, just as corporations and other pseudo-persons do.

Feinberg (1974) calls this proposal into question, claiming that only subjects that have *interests* could be treated as having a standing in law, and hence a moral status. In such cases the panpsychist can reply that trees indeed have interests – they have an interest to deploy their very nature, i.e. to grow and to reproduce. And they have an interest to avoid harm, and more importantly, to survive. For example, it is not without reason that plants dilute their leaves to the light and avoid acescent liquids – and when a plant is under attack by insects, it communicates with surrounding plants in order to warn them (cf. Coghlan 1998). Furthermore, plants and especially ecosystems as a whole are ends in themselves. They are not refundable like a pen or a wheel. Some trees in the Sequoia ecosystem are more than 3,000 years old, and are among the largest in the world. And once an ecosystem is destroyed, nature faces an uphill battle to find its natural balance again. In the case of ecosystems, it is quite evident that a plant cannot have conscious interests – in this sense a patient being in a coma cannot 'have' interests either – but nevertheless *living* organisms have an interest to live, i.e. a *will-to-live*, independent of the projections of an observer.

Panpsychism offers an alternative to an irrational, uncontrolled exploitation of nature, to today's nihilism and relativism in regard to questions of morality, to a narrow-minded anthropocentrism, and to actions that do intentional harm to subjects which can suffer pain. The formulation of 'human dignity' is without a doubt very important and one of the greatest intellectual and ethical achievements in human history, but the present situation calls for widening its scope to all participants in the planetary ecosystem. Anything less would be unworthy of the name.[19]

19. I am grateful to Regine Kather for helpful comments on earlier drafts.

PART II

Process philosophy

CHAPTER 9

Back to Whitehead?

Galen Strawson and the rediscovery of panpsychism

Pierfrancesco Basile

> Men can be provincial in time, as well as in place. We may ask ourselves whether the scientific mentality of the modern world in the immediate past is not a successful example of such provincial limitation.
>
> Alfred North Whitehead, *Science and the Modern World*, p. vii

According to William Seager (2005), panpsychism is the doctrine "that mind is a fundamental feature of the world which exists throughout the universe" – could anyone believe such a thing? Despite its paradoxical ring, panpsychism has had a long history, as it has been recently documented by David Skrbina in his book, *Panpsychism in the West* (2005). It flourished in the idealistically saturated atmosphere of the turn of the nineteenth and the twentieth century, when many a thinker with a secure place in the philosophical pantheon of the day was either committed to it, or at least ready to consider it a viable philosophical option. In *A Pluralistic Universe*, William James speaks of "the great empirical movement toward a pluralistic panpsychic view of the universe, into which our own generation has been drawn" (1909/1996: 270).

Even after the rise of analytical philosophy, panpsychism did not fade from view. In the second half of the twentieth century, it has been forcefully advocated by process philosophers in the Whiteheadian tradition such as Charles Hartshorne and David Ray Griffin. Moreover, the doctrine has been held by a truly original thinker the value of whose works has not yet been adequately recognized – the British Idealist Timothy Sprigge. Process philosophers and British idealists are rare – if precious – appearances on the contemporary philosophical scene. Like all exotic creatures, they fascinate and perplex by reminding us of radically alternative ways of viewing the world and of valuing it. But like all exotic creatures, they are also better kept at a distance. Thus, although it never wholly declined, panpsychism has been marginalized. When it was taken notice of, it was treated with scorn and ridiculed.

Peter Simons (2006: 146) has recently observed: "that great philosophers such as Leibniz or Whitehead have been panpsychists is insufficient recommendation: everyone makes mistakes." But no panpsychist bases his case upon an argument from authority and, *prima facie* at least, it does seem that a theory with such credentials deserves a fair hearing. Moreover – and despite the fact that panpsychism is indeed a difficult doctrine, as the following pages will not try to conceal – it is unclear that philosophers of the like of Whitehead and Leibniz made any significant error.[1]

1. Panpsychism resurrected

Surprisingly enough, panpsychism has re-entered mainstream analytical philosophy in recent years, first with Nagel 1979 paper "Panpsychism" and then most forcefully with David Chalmers' *The Conscious Mind* (1996). Although Chalmers did not endorse panpsychism, he was able to provide a series of compelling arguments against alternative attempts at explaining the mind's place in nature.

Specifically, Chalmers tried to make sense of the notion of the ubiquity of experience by advancing the hypothesis of a close link connecting conscious awareness and information-processing activity. Since any physical process can in principle be modeled as an information-processing system, he suggested, the existence of this link could account for the universality of experience. As he has it,

> We might put this by suggesting as a basic principle that information… has two aspects, a physical and a phenomenal aspect. Wherever there is a phenomenal state, it realizes an information state, an information state that is also realized in the cognitive system of the brain. Conversely… whenever an information state… is realized physically, it is also realized phenomenally. (p. 286)

For Chalmers this was only a tentative speculation. He did not try to clarify the precise nature of the link between information and experience and some of the implications of his hypothesis are indeed off putting. Since a thermostat is an information-processing system, one has to conclude that there are experiences in a thermostat too. Chalmers's is indeed a strange view, one that is difficult to digest even for minds accustomed to the extravagancies of philosophical speculation. Quite recently, this has led John Searle (2004: 15) to deplore panpsychism's "inherent implausibility." It is difficult to think of the thermostat as having experiences – does it enjoy instantaneous flashes of sensation when changing from one state ("heating") to another ("cooling")?

It should be noted, however, that in ascribing experiences to a thermostat Chalmers went much further than most panpsychists would. On most theories, one has to distinguish between the experience of the parts and the experience of the whole. All experiences one could find in ordinary physical objects are the experiences of their most basic constituents. Reassuringly enough, panpsychists do not necessarily have to believe that thermostats – or inanimate things such as sticks and stones – think and feel.

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1. And indeed, despite his rejection of panpsychism, Simons virtually admits that he is in the end unable to say what it is that speaks conclusively against panpsychism; see ibid.: 150.

According to Simons,

> While there are stones and rivers, they are not of a fashion for it to be possible for them to have presentations: we think they do not, which is why when we try to imagine what it's like to be a stone we draw a blank. Since they in fact do not, panpsychism is false. Not absurd: there *might* be a very dull what-it's-like-to-be-a-stone. (2006: 150)

This line of argument involves a misrepresentation of the panpsychist's view. In the case of complex entities such as stones, it is possible to speculate that all the experience is in the simplest parts, not in the complex they compose. *Pace* Simons, the panpsychist is not committed to the view that there is "a very dull what-it's-like-to-be-a-stone." Nagel (1979: 181) recognizes this very well, for he defines panpsychism as the view "that the basic physical constituents of the universe have mental properties." Nagel here explicitly ascribes mental properties to the basic constituents of reality, not to all beings indiscriminately. Surely, to believe that a whole (a rock) must have all the properties of its parts (the rock's ultimate constituents) is to be guilty of the mistake known as "the fallacy of composition."

In spite of the paradoxical implication of Chalmers' particular version of panpsychism, he succeeded in presenting it as a respectable answer to a real philosophical *impasse* – a genuine alternative worth pursuing for philosophers dissatisfied with current versions of materialism. Because Chalmers associated panpsychism and information, moreover, he made it look somewhat less offensive to modern philosophical sensibilities. Although prejudices are hard to die, the door was open for a reassessment of an old, venerable doctrine.

2. The case for panpsychism: Strawson on emergence

Besides Chalmers, Galen Strawson is perhaps the one analytical philosopher who has made the most to promote a panpsychist view of reality. In his 1994 *Mental Reality* (hence two years before the publication of Chalmers' *The Conscious Mind*, which shows that Strawson was following his own independent path of inquiry), he had already recognized that what creates the mind-body problem – very roughly, the problem of explaining how a material brain could think and feel – might well be that we have "no adequate grasp of the fundamental nature of matter at some general level of understanding" (p. 87). In marked contrast to the majority of his fellow philosophers, he also argued that "the problem of the relation between the experiential and the non-experiential is so difficult that panpsychism deserves to be taken seriously" (p. 89).

About 10 years later, Strawson has reached a point where he feels confident to embrace a panpsychist view of reality. This has been vigorously defended in a series of essays, among which the most notable bears the quite significant title "Realistic Monism: Why Physicalism entails Panpsychism" (2006). His argument in support of panpsychism is straightforward enough and consists of two main steps. In the first place, he rejects eliminativist views such as Dennett's that deny the reality of experiences: such a denial is for him nothing less than "the strangest thing that has ever happened in the history of philosophy" (p. 5). The reasoning here is as simple as it is convincing. The claim that there are no experiences and that it only *appears* that there are any is self-defeating, for as long as there are appearances, there is experience.

Insofar as it is meant to prove the *existence* of experiences, the results of this reasoning are hardly to be disputed. Still, very little follows from it, for it tells us nothing about experience's *ontological status* – for example, if they are modes of a substantive soul or functions of a material brain. The crucial move in Strawson's argument is its next step. Strawson denies the possibility of the emergence of the experiential out of the non-experiential, contending that the analogies usually adduced to confer plausibility to the idea of the emergence of the mental out of the non-mental are not really convincing.

Liquidity is a case in point: water is liquid, none of its molecules are. Such an analogy had once been put forward by Searle:

> The liquidity of the water is explained by the nature of the interactions between the H_2O molecules. Those macro-features are causally explained by the behavior of elements at the micro-level. I want to suggest that this provides a perfectly ordinary model for explaining the puzzling relationships between the mind and the brain. (1984: 21)

In rejecting this sort of explanation, Strawson raises the *heterogeneity* problem. The crossover from non-experiential to experiential is of a different order than that from molecules to liquidity properties. Our knowledge of the molecules of water enables us to understand fully why water displays the features and capacity for behavior that we refer to as "liquidity." No mystery is left for someone who knows all the relevant chemical facts. The same is not true of the mind. No amount of knowledge concerning the physics of the brain seems capable of making it intelligible that brain processes should be accompanied by experiential occurrences.

Thus, the conjunct denial of eliminativism and emergence leads Strawson to the conclusion that only panpsychism can account for the relation between the mind and the body. The brain cannot simply be a system, however complex, of insentient bits. Its smaller components must themselves be – in some way that requires careful explanation – sentient. How strong *is* Strawson's argument? And how strong is it *meant* to be? Since the denial of experience strikes most philosophers as highly eccentric, the proof stands or falls with the rejection of the possibility of the emergence of the experiential out of the non-experiential. With regard to this point, however, the argument is highly ambiguous, for it lends itself to three different interpretations. Is the impossibility in question (1) *ontological* – the mental cannot emerge out of the non mental – or (2) *epistemical* – our mental faculties are inadequate to an explanation of emergence? Or does the impossibility solely amount to (3) the *factual* recognition that we have so far failed to provide any convincing explanation of how the non-experiential could give rise to the experiential?

Strawson's denial that water provides the right sort of analogy is by itself consistent with any one of these ways of interpreting the argument. The very sub-title of one his most significant panpsychist papers – "Why physicalism entails panpsychism" – clearly suggests that he holds (1), the strong ontological claim that emergence is ontologically impossible. He even goes on to say that panpsychism is "the only possible form of physicalism *tout court*" (2006: 9), meaning by "physicalism" simply any theory that recognizes that all there is falls within nature.

This is a radical claim and to establish it conclusively one will have to devote to the notion of emergence more critical attention than the one Strawson actually devotes to it. Nevertheless, Strawson's argument retains much of its force even in the absence of a conclusive proof of the impossibility of the emergence of the mental out of the non-mental. The very moderate thesis that we have at present no understanding of emergence is largely uncontroversial. Accordingly, the argument does provide a strong incentive for going in search of alternative solutions to the mind-body problem.

3. The nature of physical existence

Although Strawson grounds his case upon two very reasonable assumptions – the absurdity of eliminative materialism and the difficulty involved in understanding how the mental could emerge from what is wholly devoid of experience – it is unlikely that many philosophers will be ready to adopt panpsychism. One reason is a fear of getting involved with meaningless metaphysical speculations. Of a particular version of panpsychism such as the dual aspect theory, the theory that every brain event has a physical and a mental side, for example, Nagel (1986: 49) says that it "has the faintly sickening odor of something put together in the metaphysical laboratory."

It is surprising that a philosopher like Nagel should make this sort of claim, for he had provided a quite insightful and in some respects sympathetic presentation of panpsychism in his 1979 paper. Nagel's remark apart, philosophers are no less social creatures than non-philosophers. In spite of the fact that radical neo-positivism *à la* Ayer is long time dead and analytical ontology is largely practiced, strong anti-metaphysical tendencies still persist among analytically trained thinkers. However, it is unclear that one could have a theory as to the mind's place in nature without having to engage in "deep" metaphysical investigations concerning the inner essence of the mental and the physical – and, more importantly, concerning their place within the larger scheme of things.

Consider how the mind-body problem is typically framed by contemporary analytical philosophers. On the assumption that the universe is composed by material particles ruled by strict deterministic laws, explain in what sense if any do consciousness, freedom, and mental causation exist. In his book of 1998 *Mind in a Physical World*, Jaegwon Kim nicely illustrates this approach, as when he says that

> Giving an account of mental causation – in particular, explaining how it is possible for the mental to exercise causal influences in the physical world – has been one of the main preoccupations in the philosophy of mind over the past two decades. (p. 29)

As this passage makes clear, the problem is to incorporate recalcitrant phenomena into a *metaphysic* – the materialistic worldview – *already assumed to be true*. What if the recalcitrant phenomena obstinately refuse incorporation?

Descartes observed in the *Discourse on Method* that it is wiser to change the order of thought rather than the order of things. In issues of theoretical as well as of practical concern, it is a sensible policy to re-examine one's own assumptions in the face of repeated failures to achieve one's goal. This is what Strawson suggests we should do. Whether or not he is right in his contention that experience is in some way an ultimate feature of reality, he is certainly right in reminding us that the universe might be quite different from how materialist philosophers *assume* it to be. An instinctive reaction here is to say that giving up the materialistic framework is tantamount to "giving up" the game. But this is precisely the point at issue: what reasons do we have for playing *that* game in the first place? Strangely enough, the materialistic framework seems to be accepted as a matter of course, as if it were not itself a theoretical construction – in the final analysis, just another metaphysical view.

The partiality of today's philosophy of mind is wholly evident in the above passage by Kim. McGinn (1991:69) puts the point thus: "It is consciousness that cries out for naturalistic explanation, not cerebral matter. Consciousness is the anomalous thing, the thing that tests our naturalistic view of the world". For thinkers of earlier generations, however, it was the existence and nature of matter that was problematic rather than our consciousness, of which we have an intuitive, non-conceptual understanding simply in having it. Strawson (2003a:70) turns the cards on the materialist's table too: "In fact", he contends, "we really do not know enough to say that there is any non-mental being."

The materialist might think that his worldview is not just "another" metaphysical view – for doesn't it find overwhelming support in physical science? But this understanding of science as making positive claims about the ultimate nature of things is one Strawson does not share. In his view, science provides us with detailed knowledge of the general *structure* of reality, but says nothing about the *intrinsic nature* of the terms that support that structure. Hence, for example, science tells us that F=m·a, but provides no indication as to the nature of those things that have force and mass and that are capable of acceleration (or of the ultimate particles that are taken to enter into the constitution of such things). On this view, science deals with thing's relational properties, but takes no interest in their intrinsic nature.

In one form or another, the argument recurs in the work of most panpsychists. Apart from Strawson and Chalmers, it is widely appealed to by Sprigge. In a certain phase of his career, it was also advanced by Russell, with whose name it is now commonly associated. One important conclusion that can be derived from it is that there is nothing in science that conflicts with panpsychism. This is a theory about the inner nature of things, not about how they are related to one another. And what panpsychism says of things' inner nature is that they have experiential properties – quite literally, that they enjoy a "subjective" view. As Sprigge (1984: 156–157) says, "what has structure must have something more to it than structure", immediately adding that "this more can only be conceived as its own inner feeling of its own being". Whitehead gave a particularly perspicuous phrasing to this position, as when he praised Leibniz – whom he regarded as a fellow panpsychist – for having "explained what it must be like to be an atom".[2]

Quite independently of Strawson's conception of science as dealing with the structural features of reality, however, the legitimacy of an appeal to science can be cast into doubt. Is the question whether such things as atoms and protons, or whatever the ultimate constituents of reality might turn out to be, have experiences one the physical scientist tries to answer? And if not, why methods and theories developed to explain other types of phenomena should be assumed to have any validity outside of their restricted field of application?

It might seem reasonable to urge at this point that there is no empirical evidence of the existence of experiences at the lower levels of reality: "to all appearances," Simons (2006: 148) says, "there is nothing like experience down among the quarks and leptons." Obviously enough, those who raise such an objection are under an obligation to specify what they would regard as satisfactory evidence that quarks and leptons have experiences. It is difficult to see what the relevant tests could be. Surely, the reasons usually adduced to believe in the reality of other minds – such as the argument from analogy or a capacity for linguistic expression or meaningful interaction – find no application at the lowest levels of reality. But panpsychism makes no claim to be a scientific theory; it is nothing more than a metaphysical *hypothesis* as to the mind's place in nature.

It is sometimes argued that all experience is associated with a brain. So, how can there be experiences at the ultimate levels of reality, where there clearly are no brains? According to the panpsychist, McGinn (2006: 97) says sarcastically, "brains are a kind of contingency, a kind of pointless luxury when it comes to possessing mental states." Besides the fact that, strictly speaking, all we know is that *human* or *animal* experience is associated with a brain, not experience *as such*, it is easy to see that this objection is question-begging. Since the problem is precisely that of understanding how brains can think – "how," asks Searle, "could this grey and white gook inside my skull be conscious?" (1984: 15) – we cannot rule out from the start that experiences of some sort might occur in some of the brain's component parts. Clearly, such experiences would be independent of the brain, while at the same time playing some causal role in the production of our human experience.

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2. Whitehead (1933/1967: 132). The passage continues as follows: "Lucretius tells us what an atom looks like to others, and Leibniz tells us how an atom is feeling about itself."

4. Phenomenal parts and wholes: Strawson and the composition problem

But just how would the many experiences in the neurons give rise to the single total experience enjoyed by a human being at any one moment? Even a philosopher willing to cast in doubt his materialist assumptions might still find panpsychism unpalatable. For those who do not ascribe to the materialistic outlook any privileged epistemic status, the problem is simply one of getting the best bargain. What do we gain by renouncing the materialistic framework? The worry here is that panpsychism might contribute nothing to our understanding of the brain's capacity to elicit our conscious experiences. The problem of the emergence of the mental, so the criticism goes, is as difficult for the panpsychist as it is for the materialist.

This objection might take the form of 'the composition problem.' This is the problem of understanding how a single experience stands to the lesser individual experiences from which it is supposed to arise. How does a person's experience arise from the lesser experiences in the brain? On the assumption that there is no such thing as an independent soul, all the experience in the brain is the experience of the neurons: how, then, do the neurons' experiences combine to give rise to human mentality? Unless the panpsychist answers this question, the emergence of human mentality out of the many neuronal mentalities remains as little understood as the problem of the generation of the mental from the *non*-mental. Strawson observes that the two cases are not parallel – and therefore not equally difficult to solve – on the ground that in the former case we have a homogeneous transition from the experiential to the experiential whereas in the latter the transition is from the non-experiential to the experiential. But this is hardly satisfactory as it stands and the real explanatory work still remains to be done.

William James, himself a notable panpsychist, regarded the idea of mental combination as a self-contradictory one. At the same time, however, he came to believe that composition of lesser mental units into a larger one actually took place. Hence in *A Pluralistic Universe* he argued, under the influence of Bergson, that such a mode of combination eludes the grasp of rational thinking. What is a contradiction for thought might very well happen in reality. Although this is a form of irrationalism that few philosophers today would be ready to adopt – if there is something that comes closer to "giving up the game" in philosophy this is precisely the adoption of an irrationalist position – the thesis that the notion of mental combination is self-contradictory requires to be considered with care.

Two tenets play a key role in James's argument to the effect that mental combination is unintelligible. (1) One first assumption might be called *the idealistic principle*: this is the notion that the nature of an experience, *what it is*, is exhausted by its qualitative aspects, *the way it feels*. James formulates this idea with characteristic force in his *Principles of Psychology* (1890/1950: 163): "the essence of feeling is to be felt, and as a psychic existent feels, so it must be." (2) The other crucial idea might be referred to as the *holistic principle*. This is the notion that an experience's qualitative feel essentially depends upon that experience's relation with the other experiences with which it occurs. Thus, for example, a lemon ice-cream has a different taste when one drinks coffee with it as when one drinks water. One still experiences the taste of lemon, but it is not quite the very same experience that one enjoys in the two cases.

On these assumptions, if a lesser experience (such as those that might occur in the neurons) were to become a constituent part of a larger one (a moment of human mentality), it would have to be both the specific experience it is (what it is as an aspect of the total neuronal experience) and something quite different (what it is as an aspect of the total human experience). Surely, the qualitative feel of the experiences of the neurons would have been altered by being included in the larger experiential whole that is a moment of human mentality. So, how could what feels in a certain way – the neuron's experience – be numerically the same with what feels in a different way – the neuron's experience as it enters the human mind? If the being of an experience is its qualitative feel, one would have to conclude that two numerically distinct things – *two ways of feeling* – are one and the same particular. But this is a violation of the logic of identity: A can't be identical with not-A.

The idealistic and the holistic principles are highly plausible assumptions to make. However, the idealistic principle has the seemingly awkward implication that there cannot be unconscious experiences. If for an experience to *be* is to *feel* in a determinate way, then an experience must always be felt by some subject. This does not as yet imply any particular view as to how that subject must be conceived (the experiential occurrence could be itself the sentient subject, as Whitehead maintained), but certainly the principle implies that an experience exists only inasmuch as it is felt. The phrase "unexperienced experience" is what it seems – a contradiction in terms. And since we are accustomed to speak of "unconscious experiences," we are left with a typical philosophical conundrum: one begins with an apparently trivial remark and ends up with an unwelcome conclusion.

But the situation is not as bad as it might look at first glance. When one goes to the dentist, should one say that one has felt no pain, although the pain was there to be felt but the anesthetic prevented this from happening – or should one rather say that there was no pain at all, but only the usual set of physiological conditions for pain and that the anesthetic prevented them to effectively generate the pain? The latter view seems the more natural to take. This does not yet answer the question whether there is a phenomenon the psychologist is referring too when talking about the unconscious, but the nature of the unconscious is too complex an issue to be discussed here. For present purposes, the crucial question is how James's thesis that composition is unintelligible can be disputed, since it is based upon two quite reasonable assumptions.

In an attempt to show that the composition problem does not amount to panpsychism's final refutation, Strawson (2006b: 252) answers the criticism that composition is impossible by restricting the import of James's idealistic principle. In having my experiences, I am not acquainted with their *whole* essential nature; I only come to know them *in certain respects*. Thus, there might be many other facts about my experiences that I ignore; although I very well know the nature of my present experiences in having them, it might still be true that they are constituted by other individuals. This could simply be one of the hidden facts about my experiences, one that is not directly disclosed. As he has it,

> it seems, then, that I can... suppose that one of the hidden facts about the nature of my experience – whose essential nature is partly revealed to me simply in my having it – is that it is somehow constituted – composed – of many other experiences. (pp. 252–253)

This reply is not entirely convincing. It is certainly true that there might be many truths about my experiences that I am not aware of. It is questionable, however, that such truths will concern my experience's intrinsic nature; it is easier to think that what might escape our notice are facts about our experience's relational properties. But even granted that the essential nature of any experience of mine is only "partly revealed to me simply in my having it," it surely must be true that such hidden facts cannot be inconsistent with those features of my experience I am immediately acquainted with. Now, one of the facts concerning my experiences I know by way of direct acquaintance is that they are *mine* – and nobody else's.

This requires some explanation. For James the problem of composition has its counterpart in the absolute idealist's problem of explaining how a moment of human mentality could be part of the Absolute's mental life – a larger whole of experience of which human minds are supposed to be internal aspects. What creates the problem for James is that we seem to have a distinctive and positive feeling of our individuality. But if there truly is such a feeling, whether or not there also are hidden facts becomes irrelevant. For even if there are, they will have to be consistent with what we would seem to know about our experience, namely that it is *not* fragmented and shared with other – lesser or greater – owners. The objection could perhaps be put as follows. To say that the "hidden fact" concerning our consciousness might be that it has other lesser consciousnesses as parts, is tantamount to admitting that our consciousness is positively presented to us as an indecomposable unity. And if it is true that the essential nature of my experience is disclosed by my having it, as Strawson holds, then my experience cannot have parts. The only alternative would be to recognize that my experience is both simple (this would be the fact disclosed by having it) and complex (this would be the hidden fact). As James rightly observes, this would be a violation of ordinary logic.

Thus, even if one limits the import of the idealistic principle that experiences are what they appear, the difficulty remains. Either mental composition is declared to be impossible on the basis of ordinary logical standards, or, one admits composition and renounces the logical standards that condemn it as impossible. In the latter case, one would either have to adopt irrationalism, as James eventually did, or suggest alternative logical standards (although it was not developed with a view of solving the composition problem, the Hegelian dialectic would be an example of such an alternative, superior mode of thought). No doubt, these are all very difficult steps to take.

Fortunately, there is a less drastic way of countering the objection that the composition problem cannot be solved than Strawson's appeal to hidden facts. The argument that experiential composition is a contradictory notion goes trough only if one makes the further assumption (3) that the lesser experiences must come together or give rise to the higher mentality *while at the same time fully retaining their individualities*. It is only on this assumption that one ends up wondering how a neuronal experience *e* could keep its identity untouched while at the same time entering as a constituent of a larger field of consciousness *E*. Very roughly, if composition of some sort has to be possible, then lesser experiences do not have to come together into a larger one like bricks in a wall, but like rivers in a sea.

This is puzzling enough. It should be observed, however, that the analogies usually adduced to bring home the point that the composition problem cannot be solved are rather crude. James compares the experiences of the neurons with the thoughts of several persons in a row. As he explains in a well-known passage:

> Take a sentence of a dozen words, and take twelve men and tell to each one word. Then stand the men in a row or jam them in a bunch, and let each think of his word as intently as he will; nowhere there will be a consciousness of the whole sentence. (1890/1950: 160)

But certainly our neurons are not connected to each other in this simple way, so what is it that the example really proves? More recently, Goff (2006: 57) has illustrated the composition-problem with the rather implausible example of a big Pain composed of several little pains, as it were, by way of addition:

> Consider a physical ultimate that feels slightly pained, called it LITTLE PAIN 1. Consider then such slightly pained ultimates, LITTLE PAIN 1, LITTLE PAIN 2, etc., coming together to constitute a severely pained macroscopic thing, call it BIG PAIN. The pained-ness of each of the ultimates comes together to constitute the pained-ness of BIG PAIN: an entity that feels ten times the pain of each LITTLE PAIN. The severe pained-ness of BIG PAIN is wholly constituted by the slight pained-ness of all the LITTLE PAINS.

Is this an intelligible way of modeling relations between experiences? Again, there is hardly any reason to think that distinct experiences might give rise to larger experiential wholes in this simplistic way – as if they were physical objects whose weights can be added or mosaic pieces that remain untouched when brought together to form the larger picture.

Upon the whole, there is no conclusive reason to think that mental composition of some sort is impossible. To conclude that panpsychism can't be true on the ground that lesser minds could never give rise to a larger one is at least as rush as to conclude that non-eliminativism materialism is false on the ground that we currently have no understanding of how the mental could emerge from the non-mental. Nagel has spoken the wisest word:

> we cannot at present understand how a mental event could be composed of myriad proto-mental events on the model of our understanding of how a muscle movement is composed of myriad physico-chemical events at the molecular level. (1986: 50)

Or, more succinctly, all we can say is that "we lack the concept of a mental part-whole relation". True, Strawson does not have any notion of 'combination' to offer, he does not explain how a plurality of lesser experiences could give rise to a unified moment of human mentality. But it is one thing to challenge him on these crucial issues, another thing to believe to have refuted his panpsychism.

5. The great chain of being: Some skeptical doubts

The problem of emergence might also resurface for the panpsychist in the form of the so-called *derivation problem*. This is the problem of explaining how higher forms of mentality could arise from lesser ones. Whereas the composition problem is the problem of understanding how *many* experiences could become *one*, the derivation problem is the problem of understanding how experiences of a very trivial sort – such as the experiences of the most simple physical particles would have to be – could give rise to the sophisticated forms of experience enjoyed by the higher animals and human beings. The gap here is not numerical, but qualitative.

A particularly persuasive statement of the problem has been provided long ago by A. C. Ewing, who put it as follows:

> Can it be consistent dogmatically to deny the possibility of the conscious having developed out of the unconscious (in the sense of the totally unfeeling), and yet to assert the development of the humanly intelligent out of what is quite incapable of reasoning? If we are to reject the former supposition on the ground of unintelligibility, it seems that we ought to reject the latter too. (1934: 412)

That the primitive experiences in the fundamental particles could give rise to the experience of listening to Mozart's *Requiem*, Simons (2006: 148) observes, seems indeed as miraculous a fact as its origination from inert particles.

It can hardly be denied that the qualitative difference between human experiences and the experiences of the basic physical particles is such that an explanation is required as to how the gap could be closed. The derivation-problem has been recently addressed by McGinn, who believes it cannot be solved. In his view, the only coherent form of panpsychism will have to ascribe to the ultimate physical particles the same phenomenal richness that we find in a human experience: "we have to postulate richness," he says, "all the way down" (2006: 96). But it is easy to see that this turns panpsychism into a ludicrous anthropomorphism. McGinn continues:

> You can't derive one sort of experience from another: you can't get pains from experiences of color, or emotions from thoughts, or thoughts from acts of will. There are a large number of phenomenal primitives. Accordingly, we cannot formulate panpsychism in terms of a small number of phenomenal primitives – say, one for each type of elementary particle – and hope to derive the rest. We have to postulate richness at the basis.

In a way, McGinn's objection is wide off the mark: it is certainly unclear that the panpsychist has to show that sensations such as pains can be derived from visual sensations such as colors in order to solve the derivation problem. At the same time, the objection directs attention upon the crucial question of how the low-level experiences of the ultimate constituents of reality will have to be conceived. It seems ridiculous to ascribe to them visual experiences, emotions, and thoughts – Simons (2006: 146) justly makes fun of the idea "of electrons making decisions about how to spin, nuclei harboring intentions to split, or photons with existential Angst" – but if not these sorts of experiences, what sort do they enjoy? This might seem like asking for the impossible, yet it is difficult to see how one could make progress on the derivation problem without some grasp of the nature of low-level, non-human varieties of experience.

A skeptic might want to press the point one step further. Panpsychism is supposed to make a positive claim as to the inner nature of the basic constituents of reality, yet it is not clear that it is truly so. How, for example, is the experience of an electron to be conceived? In order to avoid being charged with anthropomorphism, the panpsychist will have to say that the electron's experience is radically different from the experience of a human being. The problem here is how much we can stretch ordinary language without loss of meaning. With respect to an electron's experience, so the objection goes, panpsychism seems ultimately to retreat to the empty claim that there is some unknown property or nature in the electron that under suitable conditions might give rise to higher forms of mentality.

This charge might seem too crudely Humean. Strawson would probably reply that our concepts retain their meaning even in detachment from the sensory basis from which they originated. After all, even a blind person might have a general understanding of the concept of sight as a kind of experience, provided that he has some knowledge of what it is to experience anything. True, a blind person's conception of sight will remain vague, but it will not be an entirely empty one. Analogously, we could understand *in a very general way* what it means to say that electrons have experiences. But one can legitimately doubt that this sort of reply is adequate. The differences between a human being and an electron are so great that one should wonder whether "experience" retains any definite meaning when used to qualify such remote entities.

Consider how the very same problem of conceiving indefinitely remote mentalities occurs in theology and speculative metaphysics. Here epistemic limitations with regard to the divine Mind are circumvented by recourse to metaphorical language and by way of negative assertions. Of God and the Absolute, we can only say what they are *not* – it is unlikely that this could become a viable option for the philosophy of mind. True, the two cases are not absolutely identical, because the problem of determining God's nature is generated by the idea of his transcendence, whereas the panpsychist holds to the principle of the homogeneity of the real, which means that alien mentalities are of the same general kind as ours. Still, for practical purposes it remains equally difficult to provide some positive account of their nature.

Interestingly, Chalmers touches on this point in his discussion of a thermostat's experiences. What could they be like? Having dismissed the hypothesis that they can be grasped by analogy to simple sensory experiences such as our experiences of black, white and gray, he recognizes that "we should really expect something much simpler, for which there is no analog in our experience." "We will likely be unable," he even goes on to say, "to sympathetically imagine these experiences any better than a blind person can imagine sight, or that a human can imagine what it is like to be a bat" (1996: 294).

Nevertheless, Chalmers still thinks that the word 'experience' does not lose its meaning when applied to alien mentalities, on the ground that "we can at least know something about their basic structure". Although the point is not spelled out further, Chalmers seems to have in mind a distinction between an experience's *concrete content* and its *structural features*. On this basis, he argues that we cannot ascribe to remote entities those contents that figure in human experiences (such as sensed patches of black, white and gray), but at least we can ascribe them certain structural patterns. It is unclear that even this can be done, however. After all, all the experience we are immediately acquainted with is of the human sort. Granted that we have identified certain structures in our experience, how do we know if they are typically human or not? Since we have no direct access to the experiential life of other beings, we might well project onto them structural characteristics (whatever they might turn out to be) that are typically human. Anthropomorphism is a real problem for any philosopher who tries to traverse – either up or down – the great chain of being.

6. A relational monadism: Strawson's approximation to Whitehead

Having discussed the plausibility of panpsychism as a *general* philosophical position, it is now time to consider which *version* of the theory Strawson is advancing. The notion that experience is ubiquitous is indeed a very general one. Roughly speaking, panpsychism might come in two main forms – either as the doctrine that all ultimate constituents of reality have mental as well as non-mental properties or alternatively as the doctrine that all such ultimates are purely experiential.

Arguably, one example of the former view is provided by W. K. Clifford's "mind-stuff" theory, according to which each of the fundamental particles possesses an experiential side, a small "piece of mind-stuff".[3] On the latter view, panpsychism turns out to be a metaphysical (as opposed to epistemological) form of idealism[4] according to which all basic entities are mind-like units of experience somewhat analogous to Leib-

3. Clifford (1878: 95). It should be said, however, that although Clifford is usually interpreted as a dual-aspect theorist, most notably by James in his *Principles of Psychology*, in the end he might be a Leibnizian idealist. Towards the end of the paper, he suggests indeed that what we call matter could simply be the way experiential realities appear to us.

4. Metaphysical Idealism claims that reality is experiential, epistemological that nothing exists except as perceived by a subject; strictly speaking, only the former stands in opposition to materialism.

niz's monads. In principle, it is possible to envision a 'mixed' form of panpsychism, according to which some of the fundamental particles are purely experiential, while others have both a physical and a mental side. This form of panpsychism is less attractive, however, for it would violate the principle of homogeneity of the real – the idea that all basic individuals are of the same ontological type. At the same time, a panpsychist theory that ascribes both physical and mental properties to the fundamental units immediately runs into the problem of Cartesian dualism, namely how to account for the relation between the two kinds of properties. Thus, at least provisionally, it seems best to start with an idealistic form of panpsychism and see if one can reconstruct the complexity of the world on its basis.

Strawson has not yet fully worked out his panpsychistic worldview, but there is little doubt that he endorses a radical form of panpsychism that – for the sake of terminological convenience – can be referred to as a form of relational monadism. The main difference between his theory and Leibniz's, Strawson (2006b: 274) says, is that Leibniz's "monads do not interact causally in any way, while my ultimates do." The main tenets of Strawson's worldview are that the basic units of reality are monadic like entities or active units of experience called "sesmets" (an acronym for "Subject of Experience that is a Single Mental Thing"); each sesmest is said to be made of "energy-stuff" and is to be thought of as an "active substance" (p. 257); each sesmet or subject of experience is "short lived or transient, momentary" (p. 192) and has an "inside", what it is for itself, and an "outside", what it is for other sesmets (p. 257). Specifically, sesmets have an outside insofar as they have causal effects upon other sesmets and "play a part in constituting other numerically distinct sesmets" (p. 261). Lastly, there is no such thing as empty space in Strawson's metaphysics, so that reality is a plenum of sorts; since sesmets fill the totality of being, experience is literally everywhere.

These ideas are likely to appear rather mysterious on a first hearing; as characterized by Strawson, however, sesmets are quite similar – nay, they are virtually identical with – those entities that in his mature metaphysics Whitehead termed "actual occasions." Like Strawson, Whitehead held the human mind to be a fully natural phenomenon, while at the same time holding to a pluralistic type-monism according to which all the basic constituents of reality are identical in kind. On this basis, he concluded that all the fundamental constituents of reality must be mind-like: since the human mind is an actuality we immediately known from within, an understanding of the basic structures of our mind would provide an understanding of the basic structures of all of reality's fundamental entities.

But just how is the human mind to be conceived – that is, what is the adequate *model* in terms of which human subjectivity can be grasped? Although Whitehead arrived at his views independently, he pointed out that James had already provided an adequate model for the self in *The Principles of Psychology*. Here James develops what might be called a process account of the self. The self is not a 'thing' enduring throughout and beneath the series of its perceptions, a conception Hume had already conclusively refuted in his *Treatise*. All there is to the human self at any one moment is a unified field of consciousness, lasting for a brief moment before being superseded by another such field. According to Strawson (1999: 100), "there are many short-lived and successive selves." His views are hardly distinguishable from Whitehead's and James's at this point: on this theory, all there is to the self over time is a bead or string of successive total experiential wholes.

Whitehead took up this model and generalized it to all fundamental entities, which are now conceived as unbroken series of *occurrents*, rather than as *continuants* or enduring things preserving their own identity over time. Whitehead termed each momentary reality an "actual occasion." The most fundamental particles are series or streams of actual occasions. More complex entities formed by way of combination or interaction of such fundamental particles – such as molecules, cells, and animal bodies – are complicated structures of many such streams. The metaphysics of actual entities thus provides the foundation for a comprehensive philosophy of nature, a detailed specification of which would involve a classification of the different types of wholes into which actual occasions might enter.

One further interesting aspect of Whitehead's metaphysics is that it includes an account of natural laws according to which they are not absolutely and eternally valid. Having endowed each actual occasion with an iota of spontaneity, Whitehead argued that natural laws only register how groups of occasions tends to behave once they have formed larger and stable complexes in the course of evolution. Thus, natural laws have an evolutionary origin and are statistical generalizations rather than strict deterministic laws. This has the important implication that another cornerstone of the classic materialistic worldview is abandoned – the notion that the future course of the physical world would be wholly predictable if we only had an exhaustive knowledge of the present state of the universe.

One important question raised by Whitehead's view, one that can only be mentioned here, is as to *where* these experiential occasions are supposed to exist. Is there a dimension that embraces them all? And what kind of dimensionality would be capable of hosting units whose being is 'experience,' which certainly cannot be together in the same sense in which commonsense thinks of physical objects as existing in space? Whitehead grappled with this difficult issue, which he tried to solve by the introduction of the notion of the "extensive continuum", a potential scheme of spatio-temporal structures that serves as the grounding matrix for all actual spatio-temporal relations. It is within this general scheme of potentialities that all occasions of experience finds their niche, thereby actualizing one definite spatio-temporal system among the many possible ones.

Strawson acknowledges the importance of this problem too, but seems inclined to provide a quite different solution. Hence, at one point (2006b: 260) he asks whether one has to posit one universe-wide Sesmet in order to provide a dimension to allow for the sesmets' interaction. Apparently, Strawson thinks that the proper locus for experiential occasions could only be a larger experiential whole. The question is not answered, yet Strawson makes it clear that he would be satisfied with such a solution. This would have a startling conclusion, for Strawson would now come rather close to holding the Idealistic conception that all finite sesmets are aspects of a larger cosmic mind.

Be that as it may (the point is not discussed at length by Strawson), notable among natural complexes is the human brain: how does Whitehead's metaphysics help us to account for the relation between the mind and the body? According to Whitehead, the single stream of occasions that is the human mind is enclosed within the brain, but is *numerically* distinct from it; at each moment, each human occasion stands in causal interaction with the actual occasions that enter in the constitution of the neurons.

Whitehead's answer might appear outdated to modern philosophical sensibilities, which lack the religious sense of life that so strongly animated Whitehead[5] – for what is the notion of a numerically distinct stream of human occasions if not an updated version of the traditional idea of a soul distinct from the body? But there is more than can be said in support of the theory than it appears at first sight. In the first place, Whitehead's dualism differs from the traditional Cartesian version in that the difference between the soul and the brain is only numerical (they are *two*), and not qualitative (at bottom, mind and body are constituted by the same sort of things, the occasions of experience). Moreover, by positing an ontological identity between the mind and the ultimate constituents of the brain, Whitehead does not face the traditional objection to Cartesian dualism that interaction between substances of different kinds is impossible in principle. Nor need Whitehead be truly worried by the impossibility of physically locating the soul's seat. The soul, he speculates, "probably wanders from part to part of the brain, dissociated from the physical material atoms" (1929/1978: 109).

Most importantly, Whitehead's theory is quite true to our immediate experience of the mind-body relationship. The two main tenets of his theory – a form of *interactionist dualism*, as Griffin (1998: 48) has labeled it – is that the mind is distinct from the body but interacts causally with it. This comes quite close to the Leibnizian notion of the mind as a dominant monad, that is, one that is capable of being causally affected by the body but at the same time retains some independency from it and is in turn capable of affecting the monads in the body.

This sounds too simple to be true, but isn't this precisely how we feel ourselves to be? Although it might seem paradoxical, we do think of ourselves as both *being* and *not being* our bodies. The numerical distinction accounts for the sense we have of being something over and above it, while the constant interaction between the mind and the brain explains our strong sense of bodily unity. Again, the theory might seem naïve, but it is difficult to deny that it nicely captures our immediate, pre-philosophical understanding of ourselves as embodied subjects. Surely, appeal to our experience – and not to a materialist metaphysics uncritically assumed to be true – must here be the crucial test.

5. Consider, by contrast, how strongly religious were the founders of modern philosophy of mind, i.e., such thinkers as Descartes, Malebranche, Spinoza, and Leibniz!

7. Metaphysics and phenomenology: Whitehead's account of causation

A more serious objection centers upon Whitehead's conception of causation. At the very least, Whitehead needs to explain how several occasions of experience within a stream are connected and how they can interact with occasions of experience belonging to different streams. In Leibnizian terminology, the former is the problem of *immanent causation*, i.e., explaining how an occasion of experience affects the succeeding one within the same series, while the latter is the problem of *transeunt causation*, i.e., explaining the nature of the interaction between occasions of experience belonging to distinct series.

Because of his assumption of a pervasive ontological continuity throughout the universe, Whitehead thinks that the two problems eventually reduce to one and that an understanding of immanent causation provides the key to an understanding of transeunt causation. He explains his strategy as follows:

> if we hold… that all final individual actualities have the metaphysical character of occasions of experience, then on that hypothesis the direct evidence as to the connectedness of one's immediate present occasion of experience with one's immediately past occasions, can be validly used to suggest categories applying to the connectedness of all occasions in nature. (1933/1967: 221; see also p. 184)

Whitehead needs to provide a plausible account of how successive occasions of experience are interlocked within a causal series. In order to understand how Whitehead tried to solve the problem, it might be helpful to turn to James's account of the self again. Advocating a holistic approach in which the basic unit is the total state of consciousness, James contends that we reach a better understanding of the nature of our experience if we recognize that it is not made of atomic sensations, but that it comes in "pulses" or "epochal wholes" – total moments of experience, each of which has an internal complexity but is in itself entirely unified. We learn more about the nature of such pulses in a chapter entitled "The Perception of Time," where James introduces the concept of the specious present. James' thesis is that each total moment of experience comes as an extended unity or duration-block that conserves a fading echo of the immediate past while also having a sense of an incoming future:

> A simple sensation… is an abstraction, and all our concrete states of mind are representations of objects with some amount of complexity. Part of the complexity is the echo of the objects just past, and, in a less degree, perhaps, the foretaste of those just to arrive. (1890/1950: 606)

In our stream of consciousness, successive experiential wholes "melt into each other like dissolving views" (ibid.: 279), thus establishing the continuity of our psychical life.

Like James' specious present, Whitehead's actual occasions are temporal duration-blocks that retain some aspects of the past moments, while living in the anticipation of the moment about to come. In *The Concept of Nature* (1920), Whitehead explains his position thus:

> ...we deny the immediately given instantaneous present. There is no such thing to be found in nature. As an ultimate fact [as opposed to a useful abstraction] it is a non-entity. What is immediate for sense-awareness is a duration. Now a duration has within itself a past and a future... What we perceive is the vivid fringe of memory tinged with anticipation. (pp. 72–73)

The phenomenon identified by Whitehead and James is one many thinkers had cast their eyes upon in the second half of the nineteenth and in the early decades of the twentieth century, however differently they might have then analyzed it philosophically. In *The Phenomenology of Internal Time Consciousness* (1928), Edmund Husserl introduces two concepts that nicely capture the Janus-faced nature of the present, living moment of experience: *retention*, which refers to the echoing of the past in the present, and *protention*, which refers to an occasion's anticipation of the incoming future. The idea that the experienced past goes on living in the present goes back at least to Brentano, who in his *Psychology* (1874) illustrates it with the example of our hearing of a thunder: "Into the awareness of the thunder itself" – so summarizes James one of Brentano's examples – "the awareness of the previous silence creeps and continues; for what we hear when the thunder crashes is not thunder pure, but thunder-breaking-upon-silence-and-contrasting-with-it" (1890/1950: 240).

Whitehead's daring idea now is that we have an observed instance of immanent causation in the phenomenon of retention. How can we use this apparently minimal piece of knowledge to frame a general notion of causation? According to Whitehead, a living moment of experience does not perish into nothingness when it is elapsed; rather, it loses "subjective immediacy" and survives as "objectified" in the novel one. On this theory, the present living moment of experience literally includes the past, which becomes one of its real components. Since the past is contained in the present *in propria persona* – and not merely by way of representation – the very same experiences are successively "owned" by two different moments of subjectivity.

One example might help to make this idea clearer. The notes I enjoy now while listening to the radio will keep resonating in the total experience of my next occasion of mentality, although they will have to be there not as presently felt but as just gone. According to Whitehead, what changes in this case is not the experience of the note itself, but the modality of that experience's existence: the past experience looses "subjective immediacy" and becomes "objectively immortal." On this view, aspects of our experience are capable of escaping the elapsing occasion so as to penetrate or "flow" into the novel ones, thereby affecting them.

Can Whitehead's explanation of causation in terms of the notion of objectification be intelligibly sustained? A panpsychist such as Sprigge goes along with Whitehead and James in holding that psychical reality is best understood in terms of occasions or pulses of experience, as well as in acknowledging the reality of the phenomenon of retention. He forcefully rejects, however, Whitehead's doctrine of objectification: "I find Whitehead's solution unacceptable," he says,

> since I can make no sense of a later experience containing an earlier as opposed to in some manner echoing it... I do not see how an experience which has lost subjective immediacy can be the same particular as an element in a later experience. Indeed, the very notion of loss of subjective immediacy seems unintelligible.
> (1983: 230)

According to Sprigge, to say that an experience changes its mode of being, which happens when an experience loses subjective immediacy and becomes objectively immortal, can only mean that the experience ceases to exist. The experience that is retained can be a copy of the just gone one, an item of the same general kind, but will have to be a different particular.

The objection can perhaps be brought more sharply into focus by reformulating it as follows. Consider the previous example of our hearing a piece of music. The notes just heard will keep resonating in the next moment, yet once there they will have lost their character of "presentness" and will have assumed a character of "pastness." Otherwise put, the experience of the notes feels in a different way when the notes are felt as just elapsed than when they are felt as immediately present. Whitehead would now seem to be saying that an experience might display a different qualitative feel while remaining the very same experience; as it has been argued in a previous section, however, it is reasonable to assume that, for an experience, *to be* is *to feel* in a certain way. If this criterion is applied to the example of a piece of music, since the retained notes have a different feel than the notes heard for the first time, it follows that these must be two different experiences.

Sprigge's is a powerful objection. We encounter here the same problem as with mental composition: how could an experience remain the same particular while entering as an ingredient in two distinct conscious wholes? In the case of causation, the two fields of consciousness are two successive occasions of experience; in the case of composition, they are the neuronal experience and the larger occurrence of human mentality. Strawson's own panpsychistic worldview is still in the making. Like Whitehead, he advocates a relational monadology, but to the best of my knowledge he has not yet worked out any theory as to the nature of experiential causation.

8. Conclusion

We might never be able to solve the composition problem, to account for the experiential nature of the most fundamental particles in such a way as to avoid anthropomorphism, to envisage how the gap between the most primitive experiences of the fundamental particles and listening to Mozart's *Requiem* could be closed, or to understand discursively what experiential causation amounts to. Still, not solely is panpsychism not thereby refuted, it also remains a highly attractive position. Surely, a theory that fully naturalizes the mind, viewing human experience as an integral part of its environment rather than divorcing the two, should be preferred over one that absurdly denies the very existence of human experience – as is the case with eliminativist materialism – or regards it as an exceptional anomaly within an otherwise wholly insentient cosmos – as is the case with traditional versions of dualism.

To articulate a detailed panpsychist worldview is a hard task; even to take it seriously as a working hypothesis requires overcoming many inherited prejudices. “If one hasn’t felt a kind of vertigo of astonishment,” Strawson says,

> when facing the thought…that consciousness is a wholly physical phenomenon in every respect, including every Experiential respect – a sense of having been precipitated into a completely new confrontation with the utter strangeness of the physical… relative to all existing commonsense and scientific conceptions of it – then one hasn’t begun to be a thoughtful materialist. One hasn’t got to the starting line. (2003a: 63)

Surely such vertigo, a sudden alertness to the strangeness of things, is its own reward – its enjoyment is one of the greatest satisfactions philosophy provides.

For anyone interested in exploring further how various and unimaginable the universe *might* be, the philosophy of a great thinker like Whitehead is a good point to start. As it has been argued, one will not find there a fully satisfactory solution to the mind-body problem or a convincing account of monadic interaction – yet a careful study of his works will greatly enrich one’s philosophical imagination: if we cannot take up his metaphysics so as it stands, still we can – and should – try to recover some of the spirit of his speculative adventure.

CHAPTER 10

Does process externalism support panpsychism?

The relational nature of the physical world as a foundation for the conscious mind

Riccardo Manzotti

> In the interest of science it is necessary over and over again to engage in the critique of these fundamental concepts, in order that we may not unconsciously be ruled by them. This becomes evident especially in those situations involving development of ideas in which the consistent use of the traditional fundamental concepts leads us to paradoxes difficult to resolve.
>
> Albert Einstein (in Jammer, 1954/1993, pp. xiii–xiv)

Is the physical world relational? Is the physical world devoid of qualities? The most common answer to both questions is negative. A widespread tradition defends a non-relational physical and quality-free world. Consider the world description offered by a textbook of physics. No mention of qualities is necessary. Qualities have been exiled to the psychological domain. Our objective knowledge of the physical world, albeit derived from first person experienced qualities, is allegedly independent of qualities.

Yet we experience qualities. Thus qualities are an empirical fact. Even hard-core neuroscientists like Cristoph Koch have acknowledged it: "the provisional approach I take…is to consider first person experiences as brute facts of life and seek to explain them." (Koch 2004: 7). But since objective knowledge of the world is independent of qualities, the world is supposed to be devoid of qualities. Qualities are supposed to emerge out of the subject – whatever the subject is.

At the same time, it has been observed that our mental states are relational. They refer either to other mental states or to the world. According to Brentano the hallmark of the mental is the capability of referring to something else (Brentano 1874/1973; Mulligan & Smith 1986) – a fact often labeled as intentionality or *aboutness* (Searle 1983). I think of *x*. I see *y*. I hear *z*. Although it is still rather unclear whether mental states are *always* relational, it is fair to say that relations play a fundamental role in the mind. Intentionality or aboutness seems to be dependent on some kind of ontologically fundamental relationality; intentionality entails being in relation. Nevertheless,

	No Relation	Relation
No Quality	Physical world	Intentional thoughts
Quality	Qualia	Representational view of mental content

Figure 1. Quality, relation, and the dichotomy between physical and mental world.

as it happened in the case of qualities, relations were historically removed from the physical world as a result of the modern view suggested by Galilean science.

The picture is made more difficult by the ambiguous relation between the qualitative and the relational aspects of the mind. Some authors argued that phenomenal states can be reduced either to their representational or to their intentional content (for instance, Tye 1990). Although it is unclear whether there could be non-intentional representation, in many fields such as computer science, representations are often conceived independently of any intentional commitment. Symmetrically, it has been argued that thoughts have a specific qualitative content (Strawson 1994; Chalmers 1996; Strawson 2003b). On the other hand many scholars keep maintaining either that there are purely qualitative phenomenal contents (qualia) or that there are purely intentional, viz. relational, mental contents or both (Block 1980; Shoemaker 1990; Block 1995; Chalmers 1996).

And yet, is the physical world really non-relational and quality free?

I will argue that we should not necessarily answer positively to this question. This paper is principally an attempt to argue that the physical world is relational. Furthermore, I will argue that being relational and being qualitative is one and the same. If this were tenable, the traditional gap between subjective and objective aspects could be closed. The suggested process ontology endorses a panpsychistic view of reality – a neutral monist approach in which processes can be described either under the objective quantitative perspective or under the subjective qualitative perspective. That is, I will advocate here a kind of neutral monism grounded on processes not so dissimilar in aim to William James' doctrine of pure experience. Although panpsychism has often been misrepresented and a priori rejected, many authors have recently reconsidered it (Chalmers 1996; Griffin 1998; Skrbina 2005; Strawson 2006).

In the first section I will sketch out the historical and theoretical reasons that led to the present separation between the physical world and the qualitative and relational aspects. In Section 2, I will address in more details the drawbacks of a non-relational world and I will try to show how such a world disagrees with empirical data. In Section 3, I will suggest that the physical world (as we experience it) is made of objects which are complex relational wholes. In this respect, objects are processes taking place in time. In the fourth section I will outline some more details about the kind of process ontology that can be used to deal with the physical world and with the mental world. Finally, in the last section, I will maintain that a process view of reality endorses panpsychism since it suggests that both relation and qualities are located in the world and not only in the body, or brains, of subjects.

1. Unsnarling a complex knot: Is the physical world non-relational and devoid of qualities?

We are all victims of Galileo's divide. The layman – and often the scientist too – assumes that the physical world is devoid of any formal and qualitative properties. This is rather surprising since our experience of the world is full of qualities: color, smells, shapes, tastes, sounds, and so forth. Our experience of the world is not made of numbers, geometrical relations, or physical quantities but rather of fleshy chunks of experience, each constituted by a specific quality. What is the nexus between qualities and the physical world?

Traditionally, the hypothesis of a world without qualities entails the location of qualities *inside* the subject: if qualities are not in the world, they must be elsewhere.

Similarly, the physical world is commonly conceived as non-relational. A stone is a stone and is self-sufficient. It can be defined as an individual with certain properties instantiated at a certain time. A stone, or a voltage level inside a transistor, or a mark on a chalkboard would not refer to anything but themselves if it were not for the intentional capabilities of subjects. The intentionality of physical phenomena is conceived as derivate from the original intentionality of subjects (Searle 1980, 1992). Once again relations, like qualities, have been pushed inside the subject.

The matter is made even more complex because many assumptions lurk in the background. Since these assumptions usually have a twofold structure, I present them as pairs of clauses:

Pair #1: * The physical world is non-relational.
* The mental world is relational/intentional (Brentano's thesis).

Pair #2: * The physical world is devoid of qualities.
* The mental world shows qualities.

Pair #3: * The intrinsic nature of the physical world is inaccessible to subjects.
* Subjects have a direct access to qualitative mental states.

Pair #4: * Qualities are absolute (qualia thesis).
* Objective knowledge is relational.

Pair #5: * Qualities take place inside the subject (internalist thesis).
* Objective properties are separate and distinct from experience.

Of course, there is no space to fully address each of these issues. Some important points can be mentioned, though. It is important to stress that these pairs of clauses by no means precisely and exhaustively partition the relevant conceptual space. They overlap and partially contradict themselves. Further P1, P2, and P5 are ontological claims while P3 and P4 are epistemic ones.

The physical world is non-relational. The first pair P1 addresses the belief in a physical world made of autonomous and self-contained entities. It is a development of atomism. It is the view that Whitehead (1938) epitomized as "the grand doctrine of nature as a self-sufficient meaningless complex of facts." It is important to stress that such a view does *not* correspond to recent development in physics (Jammer 1954/1993; Cramer 1988) neither in the macrophysical nor in the microphysical realm. The view matches with Brentano's claim that mental entities are intentional and in relation with their objects. The two claims conspired to keep separate the mental and the physical domain. For instance, Jerry Fodor repeatedly despaired that no physical entity can refer to anything else in the physical world (Fodor 1976, 1998). Many authors accepted this assumption and thus tried unsuccessfully to naturalize intentionality; that is, to reduce intentionality to something that is non-relational at all (Millikan 1984; Dennett 1987, 1991; Dretske 1995).

The physical world is not qualitative. The second pair P2 refers to the assumption that the physical world does not possess any quality and that qualities emerge out of the subject. Historically, the fatal step was the location of qualities inside the subject, a step carried out by Galileo:

> I am inclined to think that these tastes, smells, colors, etc., with regard to the object in which they appear to reside, are nothing more than mere names, and exist only in the sensitive body; when the living creature is removed all these qualities are carried off and annihilated. (*The Assayer*, 1623)

The "sensitive body" – namely, Galileo's version of the subject – became the natural locus of qualities. Because of their location, these qualities were subsequently called phenomenal or subjective qualities. As a result, it was possible to postpone the understanding of many troublesome aspects of reality, such as relations and qualities. For a while, the physical world became a neat and relatively well-defined place. Subsequent scholars started to look for the exact *locus* of phenomenal experience. Initially, peripheral nerves were proposed. According to Jonathan Muller's law of specific energies each nerve was capable of assigning a specific quality to its signals. Although the idea was quickly set aside, contemporary neuroscientists continue to look either for a cortical area or finer neural structures with the same capacity – namely, the neural correlates of experience.[1] So far, the quest has been fruitless.

1. See: Crick 1994; Jeannerod 1994; Lumer Friston et al. 1998; Metzinger 2000; Miller 2001; Rees, Kreiman et al. 2002; Crick & Koch 2003; Zeki 2003; Koch 2004.

It has been objected that the research is only at its beginning, and that we must wait for future breakthroughs. Yet, whoever makes this objection overlooks an important distinction. There is a practical difficulty in observing the activity of thousands and billions of neurons *in vivo*; I shall call it a *technical impossibility*. In addition there is an *ontological impossibility* of observing a quality. If the very starting hypotheses rules out the existence of qualities in the physical world, why should they make their appearance inside a neuronal network which, as complex as it is, is still a part of the physical world? It is remarkable that the very assumptions on which most of current neuroscience is based rule out the possibility of achieving any result. No matter how much correlation is recorded between neural activities and verbal reports, no observation of a quality is to be expected under these assumptions. What is usually called a *Neural Correlate of Consciousness* ought to be called a *Neural Correlate of Verbal Reports*.

On the other hand, once we accept that experiences are a fact (and most neuroscientists do), there is no reason why such qualities should not be a part of nature in general. When these qualities are part of that subset of reality – which corresponds to us – we refer to them as experiences. Yet most scholars are restrained from embracing this view since they are afraid of putting qualities back into the physical world, because of the 'mortal danger' of panpsychism or panexperientialism.

Epistemic accessibility of qualities. The third pair P3 is a rather Kantian set of claims. It suggests that the physical properties of the world are beyond the grasp of our senses and that our experience is something utterly different from the real world: "we realize that science has nothing to say as to the intrinsic nature of the atom" (Eddington 1928).

From an epistemic point of view, mental *phenomenon* and physical *noumenon* seem doomed to never meet. On the other hand, subjects are expected to have a Cartesian direct access to their mental states. This view is particularly valued among neuroscientists who maintain that experience is independent of the surrounding environment. For instance, Giulio Tononi has stated that "consciousness depends exclusively on the ability of a system to integrate information, whether or not it...is immersed in the environment" (2004: 20).

Qualities are absolute and knowledge is relative. P4 states that qualities are absolute and ontologically unrelated with the world –that is, they do not depend on their intentional or representational content. I labeled the first clause the *qualia thesis* since qualia are held to be phenomenal content independent of what they are related to. Here *absolute* is used in its original etymological meaning which comes from *ab+solutum*, that is, to be free from any relation. As to the qualities of qualia or subjective experience, many people rest on the view originally expressed by John Locke:

> Blue and yellow, bitter or sweet, can never be false ideas: these perceptions in the mind are just such as they are, answering the powers appointed by God to produce them; and so are truly what they are, and are intended to be. (1689, II, 32, 16)

Allegedly, when I have a quale of red, its content ought to be independent of the physical phenomena triggering it – although usually the same quale is triggered by the same physical phenomenon. Most qualia-related paradoxes are due to such lack of relational nature (Shoemaker 1982; Dennett 1988; Chalmers 1996). The lack of relationality is also the main reason for their causal evanescence (Jackson 1982; Horgan 1984; Kim 1998). The second clause of P4 states that all objective knowledge is relational, as shown by the existence of measurement units in physics. Every objective data is obtained comparing arbitrary chosen physical phenomena whose intrinsic nature is utterly unknown to us: "All our knowledge is essentially relative" (Maxwell 1952: 12). For instance, I know that my height is slightly less than twice the prototype rod kept with great care at Sevres in France (or equivalent), but what the intrinsic nature of 'length' is seems to be beyond my understanding. There is no direct acquaintance with this intrinsic nature. Along the same lines, Reichenbach argued

> *The objective character of the physical statement is thus shifted to a statement about relations.* A statement about the boiling point of water is no longer regarded as an absolute statement, but as a statement about a relation between the boiling water and the length of the column of mercury. (1958: 37)

It interesting to observe that, from an epistemic perspective, P4 is the opposite of P1 from an ontological point of view.

Qualities and relation are inside the subject. Finally, P5 maintains that there must be an ontological difference mirroring the epistemic divide. The place where experience takes place must possess some special ontological status. This is of course a strong anti-panpsychist stance, based mostly on the so-called commonsensical belief that our experience of the world is concocted inside our body.[2] This view is often labeled *internalism* since it assumes that experience is related with physical phenomena internal to our body. It states that our consciousness is identical to (or correlated to) the processes, events or states of affairs going on *inside* the boundary of our body (or brain). According to this view, "The goal is to discover *the minimal set of neuronal events and mechanisms jointly sufficient for a specific conscious percept*." (Koch 2004: 16). Up to now, no convincing empirical results have been presented, notwithstanding the impressive amount of resources invested in finding Neural Correlates of Consciousness (Metzinger 2000; Rees, Kreiman et al. 2002; Koch 2004). The obvious corollary of this clause is that the physical world without brains (and, for some, bodies) ought to be devoid of (phenomenal) qualities. On the other hand, many authors, like myself, have questioned the internalist view.[3]

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2. See: Crick 1994; Edelman & Tononi 2000; Metzinger 2000; Rees, Kreiman et al. 2002; Crick & Koch 2003; Koch 2004.

3. See: Clark 1997; Clark & Chalmers 1999; Hurley 2001; O' Regan & Nöe 2001; Rowlands 2003; Weed 2003; Nöe 2004; Rockwell 2005; Honderich 2006; Hurley 2006; Manzotti 2006b; Manzotti 2006a; Manzotti 2006c; Keijzer & Schouten 2007.

These partially overlapping and partially contradictory twofold assumptions constitute the implicit background from which most of the research on consciousness is carried out, in psychology, philosophy, and neuroscience. I do not claim to have analyzed them completely. They simply outline the gist of current scientific research. This is precisely the point that Whitehead observed:

> When you are criticising the philosophy of an epoch, do not chiefly direct your attention to those intellectual positions which its exponents fell it necessary explicitly to defend. There will be some fundamental assumptions which adherents of all the variant systems within the epoch unconsciously presuppose. Such assumptions appear so obvious that people do not know that they are assuming because no other way of putting things has ever occurred to them. With these assumptions a certain limited number of types of philosophic systems are possible, and this group of systems constitutes the philosophy of the epoch. (1925: 48)

2. The illusion of a non-relational physical world

In the previous section, I sketched those assumptions that triggered the invention of a non-relational and quality-free physical world. Physicists got rid of the problem of explaining not reality as such, but rather reality *modulo* a set of essential features that were located inside the subject (whatever the subject was). This epistemic strategy was extremely successful, although it induced many to accept assumptions that oversimplified the problem of the nature of the world. Epistemic success transfigured itself into ontological orthodoxy. But, for once, epistemic efficacy must not be mistaken for ontological truth.

Sometimes it is assumed that relations in the physical world and intentionality belong to two different domains. Yet if we ever want to provide a unified picture of world and mind, it is paramount to ground both aspects in a common foundation. So it should not be surprising that I will start my analysis of relations from the physical world.

In science, the removal of the intrinsic relational nature of many phenomena suggested the *self-consistency* of many entities: mass, absolute space, the living organism, the cell, the genetic code, information, the conscious mind. In time, such self-consistency was strongly questioned (Jammer 1954/1993; Oyama 1985/2000; Bickhard 2001), and in many cases rejected. For instance, according to Mach's principle, the inertial mass of an object depends on the relation with all the other masses of the universe. Absolute space got a relational twist due to Einstein's theory of relativity. The living organism cannot be conceived and understood without its ecological setting. The cell would not exist outside of an interconnected chain of interactions and inside the proper ecological niche. The genetic code has no intrinsic meaning and is tightly coupled with the cellular body. Information has no autonomous existence, it depends on the interactions between a source and a receiver – whatever they are. Finally it is questionable whether the conscious mind could be conceived in isolation, or rather if it is a way to refer to a network of causal interactions with the environment.

Another well known example of the importance of relations for developing explanations of physical phenomena is the *science of complexity*. At the beginning of systems theory, it was maintained that systems could be studied in relative isolation; a claim that proved to be fatally wrong. To deal with real systems, scholars started to develop techniques to deal with complexity in practically all fields, from engineering to weather forecasting.

In short, the invention of a non-relational physical world suggested that the world is made of self-sufficient individuals with their properties. It is a very simple ontological framework which had been embraced as well by most analytical philosophers (Strawson 1959; Armstrong 1989). The illusion of a non-relational physical world was extremely attractive since it allowed the study of several phenomena in isolation. Unfortunately, such an attractive framework does not seem to fit with empirical experience.

Whitehead (1938) wrote at length against such a commonsensical view of the world as made of "bits" which are "enduring self-identically". Each such bit "occupies a definite limited region" and possesses its own set of intrinsic properties such as "its mass, its color" and the "essential relationship between bits of matter is purely spatial".

Contemporary science stresses the interconnected nature of most, if not all, physical phenomena. It is ironic that the non-relational view of the physical world, now mostly out of date, still survives with respect to experiential qualities.

The absolute view of qualities is once more a result of their placement inside the subject – whatever the subject is. If subjective experiences were instantiated inside the subject, they would be absolute and non-relational. The non-relational view of the physical world ended by entailing a non-relational view of the mental world, too. As is shown in Figure 2 (a, b, and c), qualities and relations were squeezed out of a physical world that, being non-relational, could not foster them. Unfortunately this *divide et impera* way of partitioning reality suggested splitting the relational and the qualitative aspect of experience, too. In Figure 2 (bottom), there is the final conceptual result: all aspects of reality (relations, qualities, physical occurrences) lay in separate conceptual slots, with no hope of reunion.

As subjects, we are well aware that our own experiences are tightly coupled with the causal flow of physical events. At the same time, and contra Galileo, we have a strong pretheoretical intuition that qualities are not a pure mental outcome. Somehow, the green we see is related with the properties of the grass out there, as well as the deep humming produced by an audio subwoofer is related with the nature of air pressure. Phenomenal experiences have causal consequences and causal antecedents. We are in relation with the world, and the world seems somehow continuous with our being. How do we reconcile such empirical and experiential intuitions with the traditional framework that segregates relations, qualities, and physical occurrences into watertight theoretical slots?

	Non-relational	Relational
Physical	Objects Atoms	
Mental		Intentionality (Brentano's thesis)

a)

	Not Qualitative	Qualitative
Physical	Objects Atoms	
Mental		Phenomenal experience (Qualia's thesis)

b)

	Non-relational	Relational
Not Qualitative	Objects Atoms	Intentionality ?
Qualitative	Qualia ?	Mind

c)

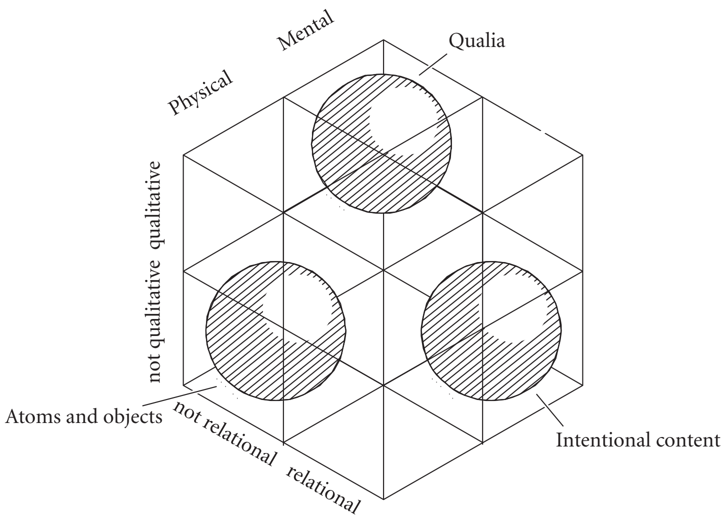

Figure 2. The possible combinations of relational and qualitative given the classic physical/mental dichotomy.

It is fair to suspect that the neat but hopeless conceptual landscape of Figure 2 (bottom) is the unwanted result of oversimplifying hypotheses about the fundamental structure of reality. In order to overcome the present limitations it is worthwhile to take into consideration a new conception of the physical world, one in which qualities are not located inside the subject but rather belong to the physical world in general.

3. The relational nature of the physical world

In recent years, several authors have pointed out the relational nature of many phenomenal experiences, as well as the relational nature of many physical phenomena.[4]

4. See: Byrne & Hilbert 2003; Nöe 2004; Byrne & Tye 2006.

By 'relational nature' I mean the fact that a phenomenon cannot take place in isolation but is always the result of an interaction between separate phenomena. A paradigmatic example of a relational physical phenomenon is offered by the rainbow (Manzotti 2006a), which can neither occur nor be conceived without an observer.

However, as mentioned before, the physical world is often conceived as self-sufficient. This is particularly true for the commonsensical picture of the physical world used in everyday life. The world of our experience is a world of macrophysical events made of objects like chairs, tables, walls, buildings, hills, and planets. They seem to be what they are, independent of both their surrounding environment and of subjects.

Furthermore, we are not directly aware of the fundamental properties of the physical world. We have no experience of electricity, gravity, photons as such but rather of much greater entities. We are aware of objects, reflectance curves, and complex relational properties (like an affordance or a sensory motor contingency).[5] I am aware of a chair, a face, a certain shade of color which is a complex whole, resulting from several physical conditions. This is the reality I experience. The reality with which I come in contact is not made of primary qualities but rather of complex wholes.

Does this macroscopical reality exist autonomously? Or is it rather a reality that has a relational nature? Here, I argue for the latter option. The target of my argument is the macroscopical object. I will argue that an object does not exist autonomously but requires some relation with a proper physical system. I am confident that the same argument could well be applied to other sensory cases, like colors, smells, tactile patterns, and flavors.

The notion of 'object' is strongly related with that of 'whole.' An object is a whole made of several parts: surfaces, three dimensional parts, or even atoms. A macroscopic object is definitely not atomic in the etymological sense ('atom' means indivisible).

Consider the classic Dalmatian dog of Gestalt psychology. Is it a whole, or rather a scattered sum of black patches? Consider a face. Is it a whole, or rather a juxtaposition of facial features? Consider a chair. It is made of four legs and a few flattened surfaces. Is it a whole, or just a sum of scattered patterns? Consider the seven stars in the sky that compose the Ursa Maior. What is the Ursa Major constellation? Is it a whole, or is it a set of separate physical phenomena?

For the sake of simplicity, by the word 'whole' I refer to what has elsewhere been called – albeit with slightly different meanings – 'integral whole', 'mereological sum', 'natural unit', or 'fusion' (Simons 1987a; Nolan 2006). I refer to a scattered collection of elements as an 'arbitrary sum'. An object is a whole.

I argue that in order to have a meaningful notion of whole, and thus of object, we need to introduce a relational and temporal aspect.

Assuming a non-relation standpoint, and given *n* elements (or initial entities of any aforementioned kind) how many wholes are there? if any? There are three possible

5. See: O' Regan & Nöe 2001; Jones 2003; Nöe 2004.

	No Composition	Restricted Composition	Unrestricted Composition
# of entities	n	$n < N \ll 2^n - 1$	$2^n - 1$

Figure 3. The different number of total entities with respect to the chosen criterion.

answers. First, the principle of *Unrestricted Composition* holds that for any group of elements, there is a whole that they constitute (Lewis 1986; Bigelow & Pargetter 2006). Succinctly, it states that "whenever two things exist, then there is also a third thing that contains those two as parts" (Bigelow & Pargetter 2006: 486). Such a view admits the largest possible number of wholes (for n parts, it accepts $2^n - 1$ wholes). The second option – sometimes referred to as *Restricted Composition* – limits the total number of wholes. It is an option closer to our everyday experience. Unfortunately, as we will see, up to now it has been an ambiguous and vague option. Finally, the third option – *No Composition* – maintains that there are no wholes at all.

The main problem with both Unrestricted Composition and No Composition is their distance from common sense. The main problem of Restricted Composition is its inherent vagueness. To avoid this, for lack of an unequivocal criterion to distinguish between wholes and arbitrary sums, previous authors suggested accepting Unrestricted Composition or No Composition (Lewis 1986; Sider & Braun 2007). As Daniel Nolan pointed out,

> Unrestricted composition seems to disagree with commonsense (and it certainly goes well beyond it) while it allows that there is a whole object whenever commonsense says there is, it says that there are wholes where commonsense does not (there is an object which is my left ear plus the Alpha Centauri system, and it does not include intervening objects in the intervening space, or elsewhere). (2006: 717)

It seems fairly agreeable that, according to most versions of Restricted Composition, a whole made of Nolan's left ear plus the Alpha Centauri system is not *really* a whole. There are collections of things that do not seem to constitute a real whole. Are they a whole? Hardly. And, yet, why not? So far, Restricted Composition has not offered a substantial alternative.

The criterion "hanging together when pushed" does not hold for many otherwise acceptable wholes. There are wholes that span time, like an uttered word or a sound. A series of sound waves, constituting an uttered word, could well be a whole, without being made of things hanging together. Peter Simons (1987b: 291) stressed the absence of a working criterion: "How a number, a sigh, a poem, a person, a galaxy, and a thunderstorm could comprise and exhaust a single individual seems beyond understanding."

A possible solution is to consider a whole as a relational entity and, thus, objects as relational entities. What kind of relation are they? Consider a simple causal relation. An object does exist if it is engaged in a causal process. According to this view something does exist if and only if is the *cause of something as a whole*. Consider two propositions.

[a] A exists.

[b] A produces effects.

Let A be any kind of physical entity: an object, a state of affairs, an event, a particle, a person, anything that can be conceived as being concrete (like a stone, a star, a flame, an explosion). My claim is that [a] and [b] are coextensive. In other words, whenever [a] holds, [b] holds too, and vice versa.

Ad absurdum, suppose now that [a] and [b] are not coextensive. Then there should be some entity A* for which [a] is false, and [b] is true, or vice versa. Is this possible?

Consider [a] false and [b] true. If this were the case, there should be an A* that produces effects and that does not exist. It would be something that would deny the classic picture of reality. It would contradict the law of conservation of energy and matter. It would not make sense. It is, at least, nomologically impossible.

Consider [a] true and [b] false. If this were the case, there should be an A* that exists and that does not produce effects. This looks less problematic than the previous case; yet only apparently. It is impossible to measure or observe something like A*. To be measured or observed A* must produce a distinguishable effect on some instrument of measure. Light is observable since it produces effects on the cones and rods of our retina or other suitable physical apparatuses. Mass is measurable since it curves space and thus it exerts a force. By hypothesis we assumed that A* does not produce any effect whatsoever. Thus, whether A* exists or not is not an empirical or scientific fact, since it cannot be the object of any observation. Furthermore, from a broader point of view, the existence of A* cannot make any difference for anything else in the universe. In fact, A* is *out of our universe*, for all practical (and non-practical) purposes. Another way to put the matter is the following. There is no difference between the existence and the absence of something like A*. Again, it is nomologically absurd that [a] and [b] are not coextensive.

Then we are left with the fact that whenever [a] is true, [b] must be true, and vice versa. If this holds, then 'existing' and 'producing effects' are coextensive. This is quite important because it means that existence is always embedded in a causal relation spanning time and space – something I will build upon in what follows.

Grounding the notion of existence on that of causation could seem rather hazardous, but there can be no other viable solution. I rest on Davidson's view of causation:

> The inevitable comment (since the time of Mill anyway) is that the striking [of the match] may have been *part* of the cause, but it was hardly sufficient for the lighting since it was also necessary for the match to be dry, that there be enough oxygen, etc. This comment is, in my opinion, confused. For since this match was dry, and was struck in enough oxygen, etc., the striking of this match was identical with the striking of a dry match in enough oxygen. How can one and the same event both be, and not be, sufficient for the lighting? In fact, it is not *events* that are necessary or sufficient as causes, but events as *described* in one way or another.
>
> (1969/1980: 172)

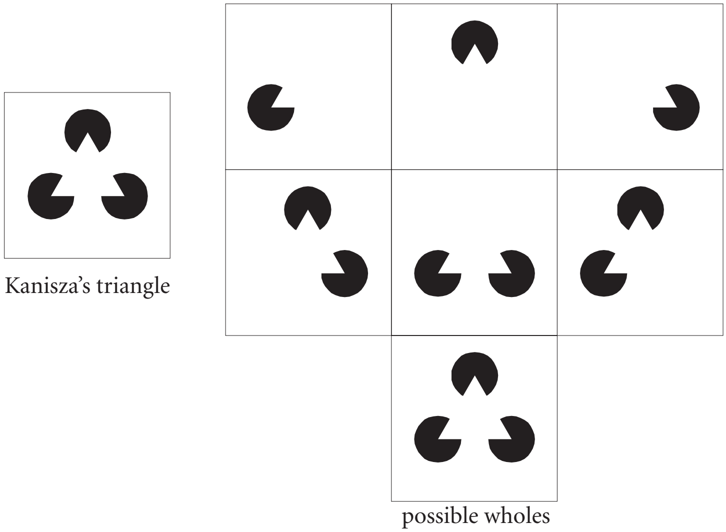

Figure 4. How many objects are contained in Kanisza's triangle? One, three or seven?

In short, I do not rest my argument on a type-notion of causation but on actual causal occurrences.

The idea that existing is coextensive with producing effects can be fruitfully applied to many problems (Manzotti 2006a, 2006b). Consider the figure known as Kanisza's triangle (Figure 4, on the left). In that figure, there are three black round shapes with a missing wedge. Consider each of these shapes as an atomic object. The question is, here as above, how many objects are there in the picture? A possible answer is 'three' (No Composition). Another answer is 'four' – the three shapes plus the whole made of all of them (a case of Restricted Composition). A further possible answer is 'seven' – the three shapes plus the whole made of all of them plus three bi-shapes made of two shapes each (Unrestricted Composition).

Since No Composition does not satisfy our pre-theoretic intuition about reality, Unrestricted Composition inflates the number up to seven, which seems too much. Whereas the former approach turns down every whole, the latter considers every possible combination as real. Unrestricted Composition appears to be too prodigal. The total number of possible wholes is definitely much larger than those that are actually taking place. A number of 100 parts would be enough to produce 1.2×10^{30} potential wholes (see Figure 3).

As I mentioned above, neither Unrestricted Composition nor No Composition satisfy our pre-theoretical intuitions. The most common answers would have been 'one', 'three' or 'four'. These answers correspond to the intuition that there are some combinations that are real wholes while there are other combinations that are not. How to distinguish between them? The whole made of three shapes looks more real than the three intermediate wholes made of two shapes each. This is a phenomenon with a very well-known perceptual explanation. But here we are interested whether there is any ontological difference. Look at Figure 4: What makes *g)* a whole more 'substantial' than *d)*, *e)*, or *f)*?

I suggest that the difference is an actual occurrence of a causal relation that makes *g)* ontologically a real whole instead of an arbitrary sum. On the basis of the causally related view of existence outlined above, a whole is not something that *exists*, rather it is something that *takes place*. The only way to take place is to produce effects. In other words, a whole does exist insofar as it produces an effect.

The threshold between possible wholes and real ones corresponds to the difference between those actually producing effects and those not.

In Figure 4, I draw explicitly the seven different "potential" wholes made of three blobs. Such a sketch is misleading since they are only potential wholes represented in a timeless domain. On the contrary, in Figure 5, I tried to represent explicitly the temporal dimension of these wholes. They do exist since they produce effects.

In Figure 5a, the three blobs are represented at *t=0*. Is anything going to happen because of them? If nothing is going to happen because of the three blobs, I claim that they do not exist.

For the sake of the argument, consider the three blobs in a toy universe. In such a universe there is only one other entity. This other entity, whose nature we are not concerned with, is capable of interacting with a single blob at a time. The entity acts as a context that let a blob at a time to produce an effect. An example of context is an environment with enough oxygen, a given air pressure, a certain level of humidity, etc. Other examples are neural structures, locks, or any physical system capable of reacting to other physical events.

In such a universe, the only possible occurrence is produced by a two-way interaction between one of the blobs and the other entity. In such a universe, only single blobs exist. This is a universe corresponding to No Composition and is represented in Figure 5b.

Let us modify the toy universe. This time, there is only one other entity, different from the previous one and capable of interacting with three blobs at a time. One or two are not enough to trigger the interaction. Three are needed. In this universe, only the whole of the three units exist – single blobs do not exist. This universe is represented in Figure 5c.

Finally let us introduce two entities: one capable of interacting with a single blob, and another capable of interacting with three blobs together. In this universe, the most similar to our own, there are four entities – the three blobs and the whole made of three blobs. This is a universe satisfying a version of Restricted Composition; viz. a casually grounded version.

Building on the previous considerations, I suggest a definition of a whole which can be used to endorse macroscopic objects. *A whole is any collection either of events or their relations or both, such that they are the cause of a joint effect.*

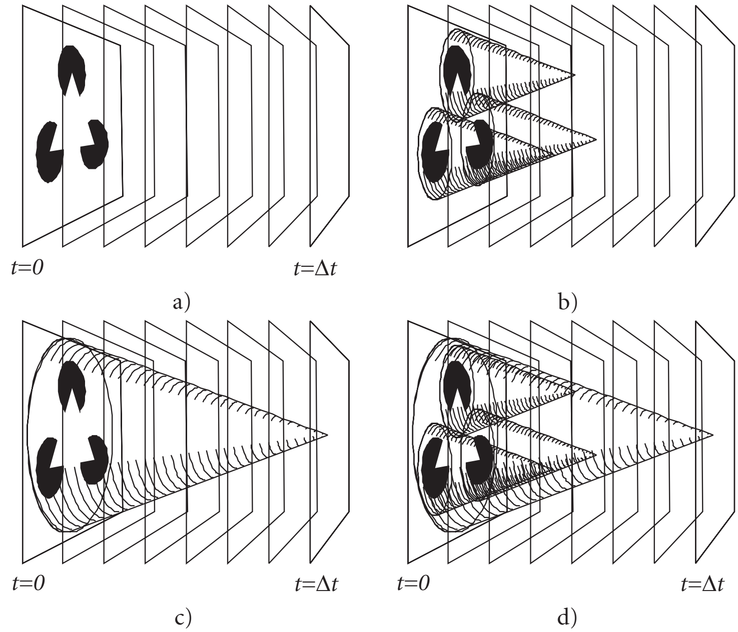

Figure 5. The relation between wholes and parts can be approached in a temporal domain where a whole corresponds to a causal relation taking place in time.

The proposed definition can be used to get a better picture of what an object is. An object is a part of reality that interacts as a whole with other portions of reality. Usually the latter role is played by subjects but it is not mandatory.

According to this view, a table is an object because it can usefully interact with human beings in order to let them lay down other objects on a flat surface which lies off the ground. The Dalmatian picture is a dog since our perceptual and cognitive system allows it to take place in a certain way. Other kinds of observers would not see the whole, and thus the scattered sum of black patches would not become a whole. Faces are objects because they are continuously amidst subjects capable of recognizing them. Finally, the Ursa Major constellation becomes an object in its own right, because at the end of a long journey the light rays emitted by its seven stars meet a human eye linked with the proper brain.

A question could spontaneously arise: Were there any objects in the universe 10 million years ago? 1 billion years ago? What level of 'observer' is required to unify phenomena into a whole, and hence into an object? I suggest that the perception of an object is identical with the taking place of that object. For instance, is it meaningful to conceive written characters without subjects capable of recognizing them? Are there pattern without observers? An observer is here conceived not as an epistemic agent choosing a favored interpretation. The observer of *x* is any physical system that would allow *x* to take place and produce effects as a unified entity. *X* could be made of any complex set of physical phenomena whose existence does not depend on the existence of the observer of *x*. The observer of *x* would not exist without *x* and, symmetrically, *x* would not exist without the observer. I suggest a twofold view. First, observing/representing something is being in relation with that something. Second, being in relation with something means to be identical with that something by means of a process in which two aspects of reality – traditionally conceived as separate – are embodied by the same process.

Consider a closely-aligned binary star system somewhere in the universe, and a planet orbiting the pair at a distance. Does the planet unify the pair of stars into one object? In fact it does – however it is a very poor observer since the only phenomena which are unified are the stars' masses, momentum, speed, and position. A human astronaut, orbiting in the same way, would probably unify many more aspects: shape, colors, textures, patterns on the surface, and many others. The human observer and the planet are both observer of the pair of stars, but they are observing and unifying different physical phenomena. Thus, they are observers of different objects. For instance, there is a process that begins with a nice color combination of the two stars and ends in the astronaut visual cortex. Without the astronaut, such process would not take place. The planet would be unable to make it happens. The center of gravity, incidentally, is just a mathematical simplification. There is no such a thing as the center of gravity. Bodies behave *as if they were* attracted by a center of gravity. But the center of gravity is just a conceptual shortcut to make computations easier.

A long respected tradition assumed that objects must exist independently of any interaction with the surrounding environment. Unfortunately, this is an unjustified oversimplification.

4. A process ontology to endorse a relational view of the physical world

If an object is something that takes place because of a causal relation between a set of events and a proper context, an object has an intrinsic temporal nature, since all causal relations have a temporal nature – most likely due to the spatio-temporal fabric of our universe.

The problem of the nature of the physical world shifts from a timeless perspective to a temporally-oriented view. An object corresponds to a causal relation in time and space. Hence, objects are not entities definable in any *a priori* way. Rather, they correspond to the way in which events are causally connected. An interesting consequence of the suggested view is the fact that if there were no time, there would be no objects. Let me sketch a few consequences.

First, imagine that it were possible to freeze time. According to common opinion, if time were halted everything would remain frozen, as in a snapshot. Raindrops and snowflakes would remain still in the air. Cars and bystanders would stay motionless. But think some more. In such a timeless instant, there would be no sounds since sounds require time. There would be no neural activity since neural activity is implemented by means of chemical sequences spanning time. There would be no light since light rays travel in time. Finally there would be no objects since every object requires time to take place – at least, according to the approach I presented here.

Secondly, different objects have different temporal durations. For instance, in order to take place a face needs the time required for light to go from one person to another, plus the time required to the neural machinery of the beholder to allow the face to take place as a whole. Each object has its own specific time equal to the time demanded by the corresponding causal relation. Thus, given a certain temporal window, certain objects are excluded.

Third, reality is thus made of objects taking place with different temporal lengths. At the same time there are objects very short and objects much longer. An interesting example is offered by the human perceptual system where different perceptual objects, corresponding to many different collections of events in the environment, produce effects in different instants.[6] For instance, movement takes more time than color to produce an effect in the brain. A bright spot would produce a very fast response while a face would take a longer time. So there are fast objects and slow ones.

Fourth, since objects do not exist but rather take place, objects are temporally located. A persisting object needs to be continuously rehearsed.

Fifth, objects are locatable. There could be either objects whose elements are already scattered in time (like a piece of music made of sounds that are scattered in time) or objects whose elements take place at the same time (like the black spots on a piece of paper constituting Kanisza's triangle). In both cases, the causal relation and thus the event that 'completes' the objects must take place, at least, a little after the last event of the collection.

When does an object take place? If an object is a causal relation spanning from its elements to the joint effect, when is the whole located in time? At a minimum, there must be one first event (or a sub-collection of events if they are synchronous) at one end of the causal relation, and the effect at the other end. The interval of time is finite. When does the object take place? The object cannot be considered complete *until the final effect has taken place*. There is not one temporal instant where the object is condensed. The object corresponds to the whole causal relation smeared in time and space.

However something could go wrong along the way. The object does not take place unless and until the final joint effect does take place. Metaphorically speaking, it is like getting a degree. Assume that you passed all exams and prepared and printed your thesis. Yet, because of some unexpected event, on the very last day you miss the defence. You cannot say that you took a degree. Although the underlying relevant phenomena are practically the same (studying, passing exams, writing your final dissertation), you 'get a degree' only after the dissertation, which is the final effect.

6. See: Zeki 1978; Zeki & Moutoussis 1997; Zeki & Bartels 1998.

In some sense, the occurrence of an object is only potential until it actually produces an effect. However, not until it does produce an effect – and only then – does the object take place from its very beginning.

In other words, an object does not 'occur' until a final joint effect happens – incomplete objects have no degree of existence. 'Objectness' does not exist on a sliding scale – say, from lower intensity to higher intensity. Although it could seem counterintuitive, I defend an on/off view of objects: something like the series: 0 – 0 – 0 – 0 – object! After all this is exactly what happens when we look at something, and, all of a sudden, something snaps and we are aware of that something. Neurons work this way, too. They fire when their inputs reached a certain threshold. I try to avoid reference to any kind of fuzzy or potential entities – either something takes place or it doesn't.

There are two possible views of the physical world: one is made of the familiar gravitational, electromagnetic, weak and strong nuclear fields of physics; the other is made of the familiar macroscopic objects with their familiar properties. Here I claim that the latter has a relational nature and that it cannot be defined without recourse to interaction with human beings or similarly structured systems.

A question could arise about what a 'similarly structured system' ought to be. A conscious being such as a human is capable of being in relation with hundreds of thousands of separate and distinguishable very complex events (for instance, with colors or forms). Thus her mind is extended to a very large cloud of causal processes of the kind described. A similarly structured system (a future intelligent machine, a chimpanzee) allows a comparable set of processes. More limited systems (an insect, a cell, a bacterium, a domino tile) allow smaller sets of simpler processes, but there is not any difference in the process themselves apart from the fact that they carve out a simpler aspect of reality. The quality does not emerge out of the complexity of the system – the quality is a way to refer to the nature of each process.

An analogy: A cloud is a lot more complex than a single water droplet floating in the air, but the drops in the clouds are identical to a single isolated drop. Yet, a water droplet is not a cloud. When we refer to a conscious mind, we conceive of a cloud of processes comparable to that of a conscious human being. In principle everything can (potentially) do it, to a greater or lesser degree.

If the same process – which is now entangled in the larger set of processes that I call 'my conscious experience *hic et nunc*' and corresponds to my experience of, say, the red of the characters on the computer screen – would happen elsewhere, isolated from other processes, it would be completely identical to the one which is now in my experience. It would have the same properties, the same features, and the same qualities. However, it would not contribute to a larger set of processes capable of, among other things, discussion about it. The water droplet inside the cloud, if taken out and isolated, remains the same.

If this relational view of the world, based on a process ontology, is tenable, the traditional separation between the relational mind and the non-relational physical world would no longer hold. The world and the mind could share the same relational structure embodied by the same physical processes. Furthermore, as I have argued elsewhere (Manzotti 2006a), these processes are promising candidates for mental states in general.

5. Qualities relocated in physical processes lead to a panpsychic view

We can now build on the (still incomplete) arguments presented in the previous paragraphs. There are two conflicting views which I will briefly summarize.

On one side, the Galilean view assumed that

1. reality is made of self-consisting and autonomous individuals;
2. such individuals can be known only by means of relational/quantitative properties;
3. intrinsic properties of objects are beyond our grasp;
4. qualities and relations 'emerge' inside the subject.

In the first section I addressed some of the many problems that arose from this view. On the other side, the process view suggests that

1. reality has a relational nature based on processes singling out portions of reality;
2. such processes are known because they are part of subjects;
3. qualitative and relations are identical with these processes;
4. qualities and relations are not inside the subject but rather in the world.

It is a view that can be considered a kind of panpsychism, at least according to the broad definition suggested by Skrbina (2005: 15–22), since it suggests that they are not located inside the nervous system but rather take place in the environment. Yet panexperientialism is perhaps a better term, albeit with some minor modifications from Griffin (1998). According to Griffin's definition, panexperientialism means that 'everything experiences'. I maintain that 'everything is an experience' in the sense suggested by James (1909/1996) or Mach (1886). The difference is that I emphasize a neutral ontological framework in which there is no need to bring out the qualities that, after Galileo, have been localized inside. The world is made of occurrences that, when part of the experience of a certain subject, are described either in relation with other occurrences (as in objective knowledge) or directly (as in phenomenal experience).

There are occurrences. These occurrences sometimes coalesce in a whole that is the subject. When they are part of the subject they are not different from what they are when they are taking place individually.

To experience something means that that something is part of the subject. Therefore qualities are no longer phenomenal or subjective, they are part of the physical structure of the world. Inside the subject, each occurrence can be experienced directly (as an intrinsic quality or content) or by means of comparisons and relations with other occurrences (as in the objective/quantitative/relational description).

I see a certain shade of some color while Sabrina sees a different one. How is that possible under the suggested view? The classic answer would suggest that my brain concocts a different phenomenal quality from that concocted by Sabrina's brain. My answer is that I single out a certain relational structure in light reflectances while Sabrina singles out a different relational structure. In both cases, the color we see has not been created *inside* our brain, but it is a physical process taking place partially inside our body and partially in the environment.

To recap the defended view:

– There is no difference between a pattern/object and the mental representation of that pattern;
– The two are incomplete and partial perspectives on the process by which that pattern could take place – the process being identical with the pattern itself;
– The pattern would not exist independently of the process;
– The pattern does not exist out of the relation/process that allows the pattern to take place;
– The observer does not exist out of the relation/process that allows the observer of that pattern to take place.

Thus, *everything* could unify, and *everything* could be externalized 'mind' in this sense. Human subjects are just the greater unifiers that we know of. A human brain is what it is because it is the center of a hurricane of a very huge number of unifying processes, and the mind is the part of the universe which is taking place due to them. Hence it should be clear that the view presented here is a kind of externalism grounded in process philosophy – in other words, a process externalism. Qualities and relations are not a product of the internal activity of neural systems; they are processes taking place in the world. It is equally plain that this view endorses a panpsychic stance.

CHAPTER 11

The dynamics of possession*

An introduction to the sociology of Gabriel Tarde

Didier Debaise (Translated by Arnaud Coolsaet)

Does sociology require metaphysics? This question pervades Gabriel Tarde's (1843–1904) work, and places him in fundamental opposition to the founders of modern sociology, in particular to Emile Durkheim. What Tarde tried to do, and what makes him remarkably relevant today, was to give social sciences the metaphysics they required. As I will show here, he attempted to open the field of sociology to realms – notably the physical and biological – that seemed closed to it.

Tarde's metaphysical system is organized around the concept of *possession*. As early as 1898, in *Monadologie et sociologie*, Tarde speaks of possession as a "universal fact." This does not refer to a primary category of being – a category from which, through a process of increasing complexity, it would be possible to derive the whole of more complex forms of experience. In my view, on the contrary, it signifies the giving of a *maximal extension* to the concept of possession. It can thereby be possible to follow both the common lines that characterize the physical, the biological and the human forms of existence, and to become sensitive to the specificity of each of these paths. With respect to the questions that crossed sociology in regard to power, domination and coercion processes; to the analysis of the modes of establishment and organization of groups; to the research into the individual or collective foundations of societies – in each case, Tarde's metaphysics should enable the substitution of these questions with those of another order: In a given situation, is the possession unilateral or symmetrical? Does the possession tend to amplify and intensify or, on the contrary, to loosen and break down? In what ways does it spread and how far does its grip reach?

* On this subject, see the very important distinctions between "ontic pluralism," "existential pluralism," "ontic monism" and "existential monism" used by E. Souriau in *Different Modes of Existence*, University Presses of France, 1943: 4–5.

1. A new monadology

By introducing 'phenomena of possession' such as sleepwalking, hypnotic practices, imitative influence, or social magnetism as immaterial but constitutive principles of societies, Tarde faces a major problem. The notion of possession seems to be wrapped up in a number of anthropological, social and religious connotations that overdetermine its essence. Does it not inescapably refer back to either the *active* sense of the use of a property, be it material or spiritual; or to the *passive* sense of an object or individual captured by others or put under their spell? Does it not presuppose something else – object or subject – prior to its existence, that would be its medium? Is possession not by definition secondary to a being, whatever may be its role?

On my view, the main reason for which the metaphysics of possession are necessary is as follows. It must allow, firstly, the subtraction of the sociological surveys from an implicit ontology – which is all the more effective as it remains in the background. According to this ontology there should exist media – objects, individuals or groups – that are clearly identifiable to the social dynamics. Second, it has to be able to construct a *minimal definition* of possession that can hold (necessarily) for all forms of existence – physical as well as biological and social.

It is in Leibniz that Tarde finds the main conditions for the metaphysics of possession. He sees in *Monadology* (1714) the beginning of a movement of dissolution of classical ontology (notably the identity of "being" and "simplicity"), which would, in a still implicit and unthinking form, find its most obvious confirmation in today's science. "The monads, daughters of Leibniz," writes Tarde (1999a: 33), "made a long way since their father. By various and independent paths, unnoticed by scientists, they sneak into the heart of contemporary science."

A new alliance between philosophy and science would then become necessary. This alliance would at the same time endeavor to clarify the idea of the "infinitely small" and try to unfold it inside vaster domains – vaster than those that can be granted by specialized sciences, and introducing it within their determined fields. This is so because "it is not only chemistry, which while progressing, seems to lead us towards the monads. It is also physics, natural sciences, history and mathematics themselves" (ibid.: 34). Science inherits this process of dissolution of any ontology that presents itself as the ultimate term of an investigation of the forms of being. Even the ultimate terms of a particular science are only relative to a provisional perspective inherent to this science: "[T]hese last elements to which each science ends up – the social individual, the living cell, the chemical atom – are only ultimate in the eyes of their particular science" (p. 36).

The question is thus to know how far this dissolution can reach. "From elimination to elimination, where will we end up [...]?" Tarde's answer is unambiguous: "[T]here are no means to stop on this slope to the infinitesimal, which becomes, surely very unexpectedly, the key to the entire universe." (p. 37). The infinitely small differs *qualitatively* from the finite on which ontology was built. The beings that compose it go to infinity in an increasingly imperceptible fashion, forming a continuous bundle wherein no parts, limits, distance or position can be distinguished.

Consequently, there is no reason for us to talk of 'being' anymore, but rather of *infinitesimal agencies* and *remarkable actions,* inside a finite movement. "[T]hose would then be the real agents, these small beings whom we say are infinitesimal. Those would be the real actions, these small variations of which we say are infinitesimal." (p. 40). The monad-concept becomes purely *functional* in Tarde, producing a variation or a difference inside a continuous movement. It is an agency of variation that goes 'differing,' that is to say, that has step by step repercussions *on the whole universe*, although according to variable degrees of intensity. Hence, this is how we can understand a principle that we have to place in the centre of thin metaphysics: "To exist is to differ; difference, in one sense, is the substantial side of things, what they have most in common and what makes them most different." (p. 73).

2. The souls of the World

Maintaining that the 'agency of differentiation' is the most characteristic and most common property of the monads, Tarde takes up another requirement of *Monadology*, namely, the monist one. Too often monism is confused with some kind of Platonism and opposed to pluralism.[1] When Tarde asserts that there are no two identical monads (he takes over the principle of indiscernibles); that reality is composed of "a swarming of innovating individualities, each one sui generis marked by its own distinctive seal, recognizable in thousands" (p. 65); and that these even go *differing*; – he is without a doubt heir to a kind of pluralism. This is much like Leibniz himself, when he claims that "[i]n nature there are never two beings which are perfectly alike and in which it is not possible to find an internal difference, or at least a difference founded upon an intrinsic quality." (1714/1989: Section 9). The difference is not a matter of shape or individuality of the monad – these would permit comparison and thus the distinction from others – but of its *characteristic movement* ("appetition"). It is here that monism takes its full-fledged sense. We can try to define it in the following manner: the dynamic principles are valid for each monadic existence, but the ways in which they are involved inside a particular monad pertain to the singularity of the latter. There is thus a *homogeneity of principles* and a *plurality of ways of existence*. As Tarde (1999a: 33)

1. This interpretation proposed by A. Badiou, in *Deleuze: The Clamor of Being* (1999), on the philosophy of Deleuze, to know that the univocal nature claimed by Deleuze would relate back to a form of underlying unity of the being, seems to rest on a *quid pro quo*. In fact, it implies a disregard of this monadological tradition, according to which the ontological monism becomes a requisite (and not a foundation) of a form of ontic pluralism. This is the whole question of a new approach to individuation that would simultaneously maintain the monist requirement, according to which the dynamic principles to the work are, in reality, valid for all forms of existence, and the principle of the indiscernables, that is here in question.

says: the monads presuppose “the discontinuity of the elements and the homogeneity of their being.”

Tarde is not the only one in the 20th century to attempt to link an existential pluralism to a kind of ontological monism or univocal nature of being. A similar tendency can be found in philosophers defining contemporary monadology in their own way – such as A. N. Whitehead, E. Souriau, G. Simondon and G. Deleuze.[2] Each of them takes up the Leibnizian idea according to which the dynamic principles operating in the individuation of beings are the same for all, but actualizing themselves in different manners. For instance, in *Process and Reality*, wherein Whitehead defines “actual entities” (which correspond to the monads), he writes:

> They differ among themselves: God is an actual entity, and so is the most trivial puff of existence in far-off empty space. But, though there are gradations of importance, and diversities of function, yet in the principles which actuality exemplifies all are on the same level. (1929/1978: 18)

In regard to this distinction, monism, according to Tarde (1999a: 44), can be understood in three different ways: (1) we can consider “movement and consciousness, for instance, the vibration of a brain cell and the corresponding state of mind, as the two sides of a same fact, and we delude ourselves in this reminiscence of the antique Janus”; (2) it signifies that a more fundamental reality could be the “common source,” but we then only win “a trinity instead of a dualism”; or finally, (3) (and this is the position to which Tarde commits himself) we state “that matter is mind, nothing else.” How then does this kind of monism distinguish itself from a kind of subjective idealism that would state that matter is only representation or idea? Tarde does not claim that matter is a product of the mind, but that it is already, so to say, *mind from the inside*. After “having reduced the universe to powder” monadology has, according to him, “spiritualized its particles” (p. 55). The process of dissolution previously described leaves no other possibility than “spiritualizing” these agency-nodes, or remarkable points, of which the universe is composed. Thus Tarde does not state that the universe is a representation, but rather that it “is composed of others souls than mine, basically similar to mine” (p. 44). This universal psychomorphism is therefore not a negation of matter – which becomes an effect among others of the agencies of the soul.[3] It is only opposed to every kind of materialism that would claim that the dynamic principles could just be like matter and could be derived from it. Matter appears as an effect, a phase, or even as a mode of regrouping inside the multiplicities of agencies of mind, operating one over the other.

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2. The panpsychism of Tarde is not unrelated to the spiritualism of Bergson. On this topic, see the excellent work of P. Montebello, *The Metaphysical Other: Essays on Nature Philosophy: Ravaisson, Tarde, Nietzsche and Bergson* (Paris, Desclée de Brouwer 2003).

3. See M. Combes, *Simondon: Individual and Collective* (Paris, University Presses of France, 1999).

Although Tarde does not attempt to make these elements coherent in a theory of possession, we can nevertheless bring out three fundamental principles for these metaphysics: (1) the process of *dissolution*, which allows us to subtract the possession of any prior reality of which it would be dependent, that is to say of any first ontology. Beyond the possessive agency, there is nothing; we only find a "pure void"; (2) this possessive agency is an individuation principle[4] that applies to *all beings*; it signifies that this action is both what beings have most in common (the universal fact) and what defines their difference (the ways of possession); and (3) the possessive agency should not be confused with the action of 'taking possession' of an object by subject. This would lead to a reduction of the *dynamics of power* to simple power relationships. Instead, the agency is essentially immaterial and inductive, which is pointed out by notions such as "influence," "sympathy," "imitation," "attraction" and "magnetism."

3. The powers of possession

Having brought these principles out, we can deepen the question and ask: What is a "possessive agency"? Tarde's monism forces us to ask the question on the level of the only "existing" realities, namely the souls. It is soul that possesses and is possessed; it is soul that forms these dynamics of possession at the origin of societies. We would misunderstand Tarde's panpsychism if we interpret it as the resurgence of a kind of spiritual or religious substantialism. The word "soul" has for him an exclusive technical sense; according to the interpretation I would like to give here, it defines the point of intersection between two possessive powers: *belief* and *desire*.

From very early on, Tarde was interested in these two "powers of the soul," in which he saw the source of all social and psychological phenomena. Already in his first philosophical article, *La croyance et le désir* (1880; in Tarde 1900), he writes: "At the bottom of internal phenomena, whatever they are, the analysis pushed to the limit will never discover more than three irreducible notions: belief, desire, and their point of application, pure sense." (1900: 290). He further adds, "the two first notions are the forms or the innate and constitutive powers of the subject." They appear as the native powers of all faculties – memory, perception and imagination. By their compositions and relations, belief and desire produce the more complex forms of experience of the subject. They do not limit themselves to the constitution of the subject whatsoever, but unfold themselves externally in the relations with others subjects, and become, by growing complexity, the "cement" of societies:

4. This idea of an "interested" and "eager" activity of the monad comes close to the definition that Whitehead promotes: "Whether or not it contributes to the general interest, life is a theft" (1929/1978: 190–191).

> Can we deny that desire and belief are powers? Does one not see that in their reciprocal combinations, passions and intentions, they are the perpetual winds of history, the waterfalls making political mills turn? (1999a: 50)

However, these relationships of belief and desire, primarily put down at the psychosocial level in Tarde's first texts, cannot be the paradigm of the forms of possession. They presuppose relations of belief and desire of a wholly different dimension. To be precise, they presuppose more constitutive, microscopic or infinitesimal relations of which they are often only the perceptible manifestations. In his article *La croyance et le désir*, Tarde posed them on the "macroscopic" scale because his inquiry concerned the faculties and constitutions of the subject. However, the passage to monadology, which will be required for the technical analysis of the emergence of the subject and of the social phenomena, forces him to transform the concepts of belief and desire. What he is interested in, from *Monadologie et sociologie* onward, and what mainly concerns us, is the quest for a *minimal*, *microscopic*, *agency of connection* between desire and belief. The difference, as Deleuze and Guattari write about Tarde,

> is not at all between the social and the individual (or inter-individual), but between the molar domain of representation, being collective or individual, and the molecular domain . . . where the distinction between social and individual loses all meaning. (1980: 267)

This minimal point is what Tarde calls *a soul*. We can say that everywhere there is a soul there is a connection between a desire and a belief. Reciprocally, each point of encounter of a desire and a belief is a soul, a micro-variation. When his inquiries were only concerned with the ways of constitution of the subject, Tarde was understandably inspired by Hume's empiricism and by Fechner's psychophysics. Yet it is once again in Leibniz that we have to look for the technical terms whereof belief and desire derive.

We can only be struck by the resemblance between Tarde's and Leibniz' definitions of the soul. Indeed, Leibniz writes in *Monadology* (Section 19): "[i]f we are to give the name of Soul to everything which has perceptions and desires (appetites) in the general sense which I have explained, then all simple substances or created Monads might be called souls. . .". For Leibniz the soul is essentially defined as a relationship of perceptions and appetitions. This is why it can be applied to all realms and not only to consciousness. Furthermore, these Leibnizian concepts are in close correspondence to Tarde's "belief" and "desire."

Let us start with the first of these terms: What is a perception for Leibniz? It is "[t]he passing condition, which involves and represents a multiplicity in the unit or in the simple substance [. . .]" (ibid.: Section 14). To perceive is to 'enfold' a multitude of other monads. The choice for the term 'enfold' here is fundamental for the resumption Tarde can provide of it. It shows well that the monad only covers a multiplicity; that it confines itself to link other monads together within a given perspective. However, each monad maintains its peculiar existence, being driven by reasons and aiming at its own ends. In this very particular sense, the concept of belief is for Tarde a perception. It is the link that takes place inside the monad between the realities it encompasses –

its possessions. The belief is in this sense not identifiable with some content or other; it is only a *power to link*, immanent to the monad, to the multiplicity composing it at a specific moment.

What then is appetition – the second term – for Leibniz? It is "[t]he activity of the internal principle which produces change or passage from one perception to another..." (Section 15). The object of appetition is thus perception, probably a still virtual perception but nonetheless real to the extent that it is pressing inside the monad – without which it would of course have no existence at all; it would only be an abstraction empty of meaning. The appetition is not general; it does not determine a common end to all beings, that by the same token would define a uniform tendency of the universe. However, it is situated inside such a perception with the aim of such change of intensity. Everything takes place as if each perception was crossed by a superior dimension, an aim immanent to it, but casting it beyond itself and taking it towards a new perception. Certainly this "desire cannot always fully attain to the whole perception at which it aims, but it always obtains some of it..." (ibid.).

The desire, which thus corresponds to appetition, is the possessive agency of the monad aiming at *appropriating others*: "the possessive action from monad to monad, from element to element, is the only fertile relationship." (Tarde 1999a: 91). For Tarde a monad only exists at this price; its possessive agency melds with its being. We will not, therefore, ask what are the reasons for this propensity of the monad to appropriate others, because this would presuppose possible ends beyond those set as ultimate by Tarde (p. 89): "[W]hat every being wants is not to be appropriated to others but to appropriate others." 'Desire' expresses this tendency for expansions using innumerable means to capture and to hold temporary alliances, or to seduce in order to maximally encompass other monads.[5] The expansion limits of the monad are never internal; they come from resistances, limits and shifts imposed by other existing monads, who are likewise busy working to extend their domination. They inter-limit themselves just as they inter-capture themselves.

A whole microscopic theatre of wars, conquests, betrayals and pacifications is thus played for each monad – a drama that multiplies itself to infinity. It is from this perspective that a radical distinction between Tarde and Leibniz imposes itself. We will not find in Leibniz this notion of warlike avidity that animates Tarde's metaphysics. The Leibnizian monads are centers of expression that presuppose the universe; or else, as Deleuze writes (1968: 68): "[t]he world, as the common expression of each monad, pre-exists to these expressions." Certainly, the universe "does not exist outside of what expressed it, outside the monads themselves; but these expressions refer back to what is expressed as a requisite for their constitution." Refusing every influence of the monads, Leibniz made "of each of them an obscure room where the whole universe of

5. On the subject of the theory of the *vinculum substantiale*, see M. Blondel, *A Historic Enigma: The 'vinculum substantiale' and the Preliminary Sketch of a Superior Realism* (Paris, Gabriel Beauchesne 1930); A. Boehm, *Leibniz's 'vinculum substantiale'* (Paris, Vrin 1938); and C. Fremont, *Being and Relation* (Paris, Vrin 1981).

other monads depicts itself in reduction and under a special point of view." (Tarde 1999a: 56). There is nothing surprising then in Leibniz coming back to the question of communication between the monads and eventually adopting the idea of a *vinculum substantiale* – a 'substantial chain' that linked the monads together.

In Tarde, to the contrary, the universe exists only at the price of a multitude of these conflicts, in the bosom of which the monads "aspire to the highest degree of possession; their gradual concentrations as a result." (p. 93). They compose of one another, influence and metamorphose through their encounters. The individuation of beings does not come from a universe to its expressions (the monads), but from possessive agencies to gradual concentrations, thus giving birth to the more and more complex forms of the universe.

These two Tardean powers, belief and desire, articulate the smallest and the most elementary, as well as the tallest and most massive. They define different but interdependent schemes of possession, which can be characterized by two movements, namely *contraction* and *expansion*. At the same time in which the monad expands, integrating others with the purpose of dominating them, it contracts, enjoying its own existence. To each desire there correspond new beliefs and each belief tends to acquire a larger intensity, which carries it beyond itself. The singularity of the monad should be situated in this movement, by which it makes the experience of itself, out of the whole of its actual and virtual possessions.

4. The origin and mode of existence of societies

We can now return to the initial question: How does the introduction of the monadology and the possessive relations permit Tarde to reconstruct a concept of society cleared of its anthropological limitations, and that extends at the same time to all kinds of associations, whether they are physical, biological, technical or human? I noted that the monads, by their reciprocal desires and beliefs, form gradual concentrations determining levels of membership that we can link to collective dynamics of possession. Monads, being only bundles of possessive agencies eager to posses others, are in turn objects of possession themselves. So, because of the reciprocity of possession, they transform mere aggregates into *societies*. They are at the same time active and passive – the powers to posses and to be appropriated. The emergence of societies has this price to pay. It supposes the active collaboration of all the monads involved – even in their repulsions and oppositions – in bringing into existence this collective-being, which is nothing else than the consolidation of their bounds.

To the question "What is a society?" Tarde's answer is of extraordinary simplicity: it is "the reciprocal possession, of extremely varied kinds, of all by each." (p. 85). Through this the concept of society acquires a new extension that allows Tarde to say, "any thing is a society, any phenomenon is a social fact." (p. 58). From inert matter to social organizations, we find the very same logic that spreads at different scales, and thus inside new boundaries, inside new relations of reciprocal possession:

> [S]ince the accomplishment of the simplest, the most banal, the most uniform social function through centuries; since, for instance, the a bit regular overall movement of a procession or regiment demands, we know it, so much prior lessons, so much words and efforts, so much mental energy spent almost on pure loss – what mental, or quasi-mental, energy spread in streams is then not needed to produce these complicated maneuvers of simultaneously accomplished vital functions, not by thousands, but by billions of different actors, each of them, we have reasons to believe it, essentially selfish, each of them mutually as different as are citizens of a vast empire! (p. 52)

These are the multiplicity of operations by which wanting, avid beings produce, through their encounters and by ways of convergences, oppositions or alliances – the bounds of which will hold them, as long as they are able, in a common history. The likeness between monads is for that matter the poorest kind of membership to the same "concentration." They rather join together and communicate by the disparity of their ends and tendencies.

The reciprocal possession is not only spatial; it is also, simultaneously, temporal. It is regrettable that Tarde did not explain at more length these temporal dimensions, which appear to be potentially so fruitful. However, if we take up the thread of what I have described about the ways of existence of the monads in their reciprocal interactions, it is possible to redraw these temporal relations. This is justifiable especially since Tarde seems to use the concept of *imitation* to make the current relations of the monads correspond directly with their past. "There is, in fact, as properly social only the imitation of compatriots and forefathers, in the broadest sense of the word." (p. 81). Therefore, the dynamics apply as such to the past; which is at the same time the subject and the object of the possession. The past is what presses in the conflicts that enliven the monads and what continuously transforms itself according to the current dynamics. We thus find again, under similar forms, in the relations of the monads to the past, the microscopic theatre of wars, alliances, and mobilizations that were described earlier. Every possession of a present monad by another echoes inside the whole past, according to varying degrees of importance. These go from the simplest indifference to complete transformation – not directly of the past events themselves, but of their importance and their sense. In a word, the desires and the beliefs of the monads tend to prolong their grip directly in two directions – horizontally and vertically; their struggles are played on two profoundly overlapping and simultaneous fronts.

To the extent in which it only takes into consideration the minimal relation of a monad to another, the definition of societies – the mutual agency of possession – is somewhat of a metaphysical fiction. This fiction justifies itself, however, as the minimal requirement for speaking of a 'society.' Societies as we know them – rocks, the cells of an organism, the bodies of individuals, political and religious institutions – are *entangled societies*, crossed by a multiplicity of others. The relationships we know are not those described by the monadic stage, but those that become established between complex arrangements involving monads and encountering other concentrations; in other words, societies linked to other societies.

How do we go then from the individual possession to these massive sets of uncountable numbers of "different actors" that are cells, processions or regiments? Tarde explains it by gradual concentrations that form true substantial beings:

> [A]ny harmonious, profound and intimate relation between natural elements, creates a new and superior element, which in turn cooperates to the creation of another higher element; on each level of the ladder, from the phenomenal complexities of the atom to the self, passing by the more and more complex molecule, by the cell or the 'plastidule' [organic molecule] of Haeckel, by the organ and eventually by the organism, we count as many new beings as new unities...
>
> (pp. 67–68)

Contrary to Leibniz, mutual possession creates a "harmony" that is not pre-established but emergent; and as such, every being finds itself involved in new relations of desire and belief on a higher level. This level is neither reducible to some end – towards which the entities making part of it would tend – nor to its components. Its existence is literally characterized by shaping, through its new interactions with other societies, the milieu to which the monads that gave birth to it will be connected. Technological objects display this process clearly: "The invention of iron, the invention of the motor power of steam, of the piston and of the railway, so many inventions that seem foreign to each other and that made common cause in the locomotive." (Tarde 1999a: 122). Taking up the expression of Gilbert Simondon, we may call it "a process of concretization" by which the locomotive becomes a new harmony maintaining in itself the steam engine, the piston and the iron.[6] The locomotive in turn is then involved in new relations to the rail, the navigation system, the freight, and the passengers; all of them forming their new milieu of existence according to specific paths. We find at the level of societies the same powers animating the monads: they are pervaded by "belief" (consolidation) and "desire" (amplification of movement), "unceasing tendency of internal small harmonies to exteriorize and to progressively amplify." (Tarde 1999b: 107).

The metaphysics of monads rejoins here a form of radical empiricism, one of the emergence and consolidation of societies that form, by their interactions, the multiplicity and order of nature that composes our immediate experience. The sociological monadology of Tarde opens us up to a new program of investigation and research on experience, thereby linking up the more unperceivable dimensions – one of micro-desires and micro-beliefs to the more organized and massive forms of social existence. This whole program, which I propose to call a *speculative empiricism* or *metaphysical empiricism*,[7] still remains to be completely constructed; but Tarde gave the first impulses to it, and it remains relevant to this day.

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6. Cf. G. Simondon, *Mode of Existence of Technical Objects* (Paris, Auber-Montaigne 1969).

7. I refer the reader to my book, *A Speculative Empiricism* (Paris, Vrin 2006).

CHAPTER 12

Finite eventism

Carey R. Carlson

In response to the discovery of a limiting velocity, Russell and Whitehead converged upon a doctrine known as 'eventism,' in which space-time is analyzed as a set of time-ordered moments, or "events." Eventism was well-founded by 1927, as exemplified in Whitehead's Gifford lectures at Edinburgh University, later published as *Process and Reality*, and Russell's *The Analysis of Matter*. The intent of eventism was to provide a simpler basis for physics, and at the same stroke, solve the mind-body problem. A human mental event is conceived as an individuated moment of pure phenomenal experience. It is situated in the causal order between its temporal predecessors and successors, placing it in the region of the brain. Whitehead inferred, in the manner of Leibniz, that *all* events which instantiate the causal order are monadic "occasions of experience." Russell teetered on the brink of that panpsychic generalization, but remained noncommittal.

I embrace Whitehead's panpsychic view of events, and the rationale for this is given below. 'Finite eventism' imposes a restriction that keeps infinities out of the theory: each event is restricted to a finite number of predecessors and successors. This makes it possible to construct exact diagrams of time-ordered events. Under the constraint of finite eventism, we shall find that 'less is more.' We can construct quantum theory from a bare-bones ontology of time-ordered events without employing any other primitives. This capability of eventism was unknown to Russell and Whitehead.

1. Physics without space

Whitehead acknowledged Henri Bergson as a major influence on his thinking. Bergson stressed the importance of time, and railed against "the spatialization of Nature." In this opening section, physics is reconstructed formally from *time sequence alone*, offering a de-spatialized account of the natural world that Bergson might have appreciated.

Until you formalize an idea, it cannot become a part of physics. In order to formalize what Whitehead calls "temporal succession," a temporal successor relation is required. A convention called *ordered-pair notation* suits our purpose. The expression (a, b) shall denote a primitive instance of temporal succession. The two arguments denote individual events or moments. The left-right order of arguments indicates the asymmetry of time order. Two pairs may have one argument in common. Such linking may connect any number of ordered pairs together, so that temporal structure of any finite complexity may be expressed by the use of ordered-pair notation.

First we use the ordered-pair to define a transitive relation, 'earlier than:'

> Definition: For any individuals a, b, and c,
> 1. If (a, b), then 'a' is also *earlier than* 'b.'
> 2. If 'a' is *earlier than* 'b,' and 'b' is *earlier than* 'c,' then 'a' is *earlier than* 'c.'

We then constrain the possibilities of time order with the following postulate:

> Postulate: No moment can be earlier than itself.

In mathematical parlance, the postulate imposes "acyclic order." As applied to physics, the constraint on time order is called "chronology protection." In terms of cause-and-effect, no event can be its own causal ancestor or descendant. In common parlance, there is no going backward in time.

Finally, to complete the formal basis, we constrain eventism to a finite domain:

> Finitude: Every moment has a finite number of predecessors and successors.

Surprising as it may seem, *the simple conditions given above are sufficient to construct a theory of physics from time alone*. Any construction we perform is confined to a finite number of ordered pairs. The analysis of whole-and-part arrives at logical primitives in a finite number of steps. The primitives are ordered pairings of moments. In consequence of this finitude, there is no infinite divisibility of a time interval, no continuous manifold, and no calculus in the theory.

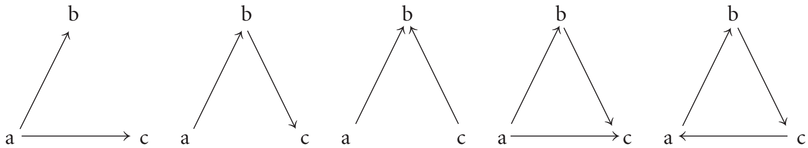
A graphic arrow, with its directional asymmetry, serves just as well as an ordered-pair to depict a temporal transition from 'a' to 'b.' In the diagrams, each individual arrow represents a discrete and irresolvable step of time sequence. We can use the argument letters to label the endpoints of the arrow:

$$\mathrm{a} \longrightarrow \mathrm{b}$$

We can depict a time series of three moments, "(a, b) and (b, c)," as follows:

$$\mathrm{a} \longrightarrow \mathrm{b} \longrightarrow \mathrm{c}$$

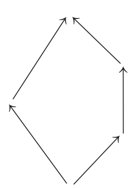
We can construct a time series of any finite length we like, but we can also construct time sequence possibilities that are not serial. There are four distinct ways that three moments can be arranged in chronological order. These are diagrammed below, along with one 'impossible figure' which violates chronology protection:



The offending diagram is the one on the far right, because each moment is earlier than itself. The first four diagrams are fine, and we assign them common names, from left to right: *fork*, *series*, *convergence*, *triangle*. Each diagram gives rise to variations if we swap the labels around while leaving the arrows undisturbed. It is 'structure' as defined by isomorphism that remains undisturbed by the label swapping. The variety of structure provides the variety of physical entities in this theory. The formal basis yields a limited variety of structural possibilities for a finite number of moments. That limited variety of natural kinds provides a basis for the application of probability theory. However, the theory is founded on the enumeration of all structural possibilities, starting with the simplest ones shown above, and probability has no part in this.

There is only one distinct diagram with exactly one arrow. There are three distinct diagrams of two arrows, counting the *fork*, *series* and *convergence*. The *series* surprises no one, since it is nearly an automatic assumption that time order is strictly serial. The *fork* and *convergence* contravene that assumption. Time order and causal order are conflated in this theory, such that "temporal succession" and "causal succession" are interchangeable terms. Any *fork* in the time diagrams thus depicts a single cause with multiple effects, and any *convergence* depicts a single effect with multiple causes.

The *triangle* diagram consists of two locally separable paths that begin together and end together. A *relative frequency ratio* is formed, which compares a 2-step path and a single-step path that traverse the same time interval. We can construct a diagram of relative frequency for any rational number. The following diagram features a 2:3 relative frequency ratio:



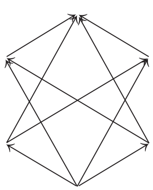
Relative frequencies serve this theory as relative energies in accord with Planck's equation E=hf. Planck's constant, *h*, is a scale factor that converts *units of frequency* to *units of energy*. This suggests that *energy is just frequency*. All we get from the latest diagram is a ratio of arrow-count for two locally separable time pathways. Suppose that the 2:3 ratio measures the relative *energy* of the two paths. The individual arrows are the countable units that yield the integer components of the numerical ratio. By that consideration, the individual arrows of our diagrams depict the individual quanta of quantum theory. Energy is 'packetized' in any account of quantum theory. In our theory, time itself is packetized into discrete transitions, and these serve the theory as energy packets.

The reciprocal of frequency is wavelength. Higher frequencies equate to shorter wavelength. In temporal terms, wavelength is a measure of duration, or time period. Higher frequency paths consist of shorter-period quanta. Frequency ratios and their reciprocals thus measure energy and wavelength respectively. We obtain the numbers that physics requires for frequency and wavelength without invoking waves or particles.

Our causally connected universe, we may suppose, corresponds to one elaborate arrow diagram. What are its highest and lowest frequencies? In a *bounded region* (to be defined shortly) the frequency range is capped at both ends. This ensures that energy density is everywhere finite. In the region of a high-energy experiment, we may hope to produce higher frequencies than those in the nuclei of ordinary matter under ordinary conditions. In an ordinary environment, the up/down quarks contain the quanta of highest frequency and least time period. That marks the high end of nuclear frequencies, which extend from there down to the somewhat lower frequency of a free electron. From there, the electromagnetic spectrum extends to lower and lower frequencies, finally fading out of detection due to increasingly feeble quanta. The low end is set, theoretically, by the age of the universe.

The diagram notation is interchangeable with the ordered-pair notation we began with. Any diagram can be labeled at its nodes and each arrow then translated to an ordered pairing of the labels at its endpoints. The theory can be expressed entirely as the combinatorics of ordered-pair expressions. That is the safeguard against over-interpretation of the diagrams. Shape and size of the diagrams are irrelevant artifacts of planar geometry that indicate nothing in the domain of reference. A diagram specifies nothing but time order. That said, we can streamline the presentation by relying on the diagrams for the more intuitive recognition of structure they provide.

In my early explorations with paper and pencil, I drew the diagrams that have exactly three moments, then the diagrams with four moments, and then a great many diagrams with five moments. I was looking for a diagram that could be replicated to make a pattern of four-dimensional time. I did not find what I was looking for until I drew the following diagram (below), which I call the *hex cycle*. It is very likely the simplest template for constructing a pattern of four-dimensional time. The hex cycle diagram depicts a time sequence of 6 moments connected by 10 transitions.



The hex cycle has a single earliest moment and a single latest moment. Any diagram for which that is true is called 'closed.' A diagram that is not closed is 'open.' A closed diagram is the simplest way to specify a bounded or localized region of time. Such a region consists of all the quanta sandwiched between two moments, one earlier than

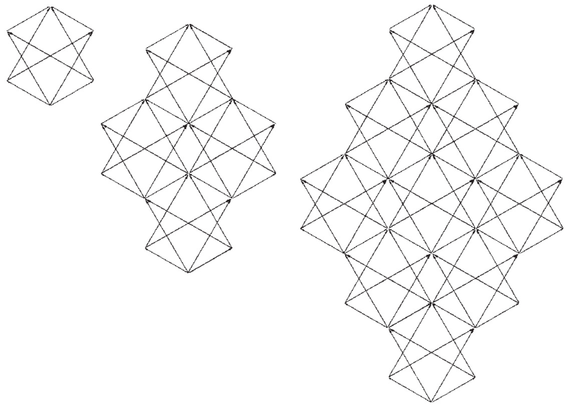


Figure 1. Honeycomb series

the other. Such causal boundedness characterizes what can be learned by the scientific method. The causal factors that govern the runtime of an experiment are localized by two bounding moments of time: the moment of initiation, when the causal laws being tested are triggered into action; and the moment of completion, when the outcome of the experiment is known. Between those two moments, nature enacts a causal sequence that culminates either at the predicted outcome or at some other outcome.

We can build a series of ever more extensive closed regions by compounding hex cycles in a 'honeycomb' arrangement:

In the absence of a continuum, *dimensionality* is a matter of counting the arrows that meet at each node of a regular pattern. As the honeycombs develop appreciable interior, we see the growth of four criss-crossing time axes. Each interior node is at an intersection of the four axes. Every quantum belongs to one of the four time axes. I call these quanta 'lattice quanta,' because they compose a pattern I refer to as the '4-D time lattice.' That is to say, there are four axes of time in this theory, and they will account for the four-dimensional manifold of Special Relativity, that which Einstein called "space-time".[1] Choosing a sufficiently large 'n' as the nth member of the above

1. In the diagrams, the four axes all look alike. "Space-time" is really "time-time" in this theory. Why then do we experience it as three spatial and one temporal? We don't. We don't experience the physical world at all. We experience phenomenal sights and sounds, just as Berkeley described in his account of vision. The visual field, with its coloration and geometry, belongs to the phenomenology of an individual human mind. The ontology of an individual mind begins there. The elaboration of further ontology – to include God, or other minds, or a physical world extended in space – proceeds by faith. Russell prefers the term "inference." Russell was just as convinced as Berkeley of the inference required for "knowledge of the external world." As he says repeatedly, no one can perceive physical objects. He derides the so-called "perception of physical objects" as "the Immaculate Perception." Nevertheless, we can, and do, make vigorous inferences about an external world. In light of this 'shot-in-the-dark' character of scientific ideas, we are

series, we can define a closed region of 4-dimensionality suited to span a cosmic scale. Such a 4-D manifold, like anything in this theory, is made of quanta. The 4-D *volume* of any subregion is measured in hex cycles. We now have a provisional account of space-time and energy. Given the energy and volume of a closed region, we can compute the *energy density* of that region.

There is no necessity to devote all the hex cycle energy to a perfectly uniform 4-D lattice. A less uniform lattice of fewer hex cycles and less energy can feature gaps or holes which delineate particle-like sequences. These separable sequences are the propagation modes of neutrinos and electrons. That is to say, the neutrino/electron formations, delineated by gaps in the uniformity, *constitute* the 4-D time lattice we call 'space-time.'

It is *charge quanta* that distinguish electrons from neutrinos. See the following figure, which shows the additional quanta locations afforded by the hex cycle:

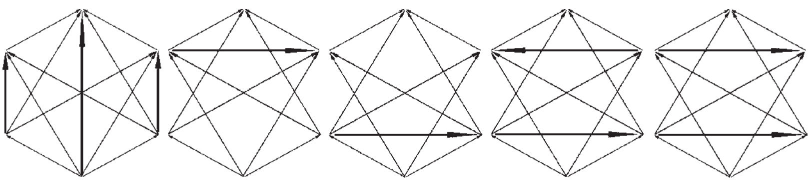


Figure 2. Quanta of momentum and charge

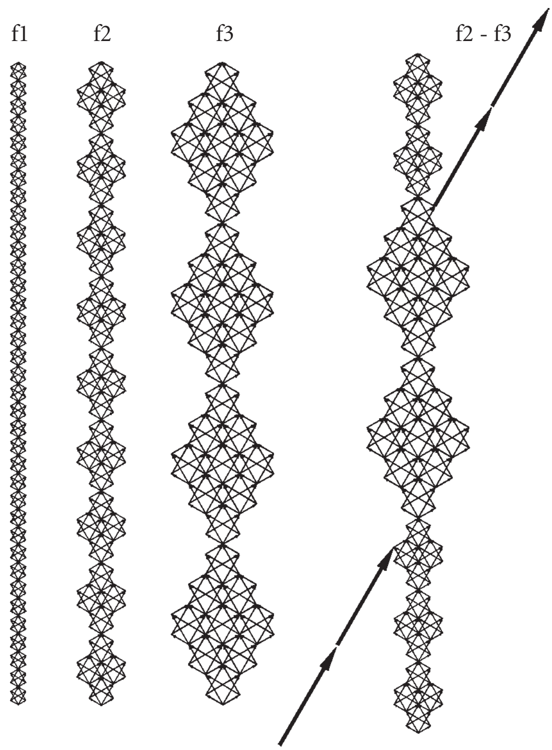
Placing the greatest importance on the hex cycle as the basis of our four-dimensionality, I have preserved its integrity as the template of all five diagrams. Variations are obtained by selective inclusion of the additional quantum possibilities afforded by the six moments of the hex cycle. In the leftmost diagram, I have drawn *quanta of forward momentum*. That hex cycle has a major axis quantum – the center arrow – which transitions directly from the earliest to the latest moment of the cycle. Such a quantum has the greatest duration and the least energy of any quantum in its cycle. It occupies the axis of bi-lateral symmetry inherent in the hex cycle. I have also drawn both of the other 'vertical' quantum possibilities, thereby preserving the bi-lateral symmetry. The "parallelism" of those three quanta is a topological feature of the hex cycle, and not just an artifact of the geometry of regular hexagons that I've employed in my drawings. The major axis and its parallels define the *axis of proper time* intrinsic to the hex cycle.

The other four diagrams include either or both of the *charge quanta* possibilities. The presence of any charge quantum breaks the bi-lateral symmetry of the cycle. Flipping or rotating an entire diagram does not affect its structure, so the four diagrams

free to reformulate Special Relativity with four time axes all alike, rather than three of space and one of time. All coordinates are then real-valued, and we dispense with imaginary numbers. The limiting velocity becomes a consequence rather than an axiom of the theory. Everything is simplified, minimizing the complexity of the hypothetical scheme in accord with Ockham's principle of parsimony.

above exhaust the charge possibilities of a single hex cycle. If we were to include all three verticals plus two horizontals (two charge quanta) in one hex cycle diagram, the diagram would be *full*. More moments would be needed to accommodate more quanta within the region of such a cycle.[2]

The *chained repetition* of a closed diagram will serve to replace the notion of 'a particle persisting through time.' Chained repetition means that the last moment of one cycle serves as the first moment of the next. At this point, the term 'cycle' acquires its usefulness, as in 'cycles per second.' The *series* is a chained repetition of a single arrow, and this will serve as the *photon* of radiant energy. The hex cycle, if it contains charge quanta, will serve in chained repetition as a *free electron*. Electron *clouds* will also consist of hex cycle formations in chained repetition. The motivation for these claims is to be found in the next illustration, which yields Bohr's formula for the 'spectral fingerprints' of the atoms.



2. The limited capacity of the hex cycle for charge quanta serves the same function as the Pauli exclusion principle. Also, symmetries of the hex cycle correspond to CPT (charge-conjugation, parity, time reversal.) For example, a hex cycle of 10 arrows has mirror symmetry about its major axis (parity). Furthermore, if we reverse the direction of every arrow (time reversal), we get the same diagram we started with (orientation on the page being meaningless).

I have drawn the hex cycles as *neutrino* cycles, without any charge quanta. As drawn, they depict modes of neutrino propagation. If we populate the hex cycles with *charge quanta*, we get electron clouds. In that case, we would have, from left to right, a *free electron*, a *hydrogen cloud*, a *helium cloud*, and finally, a hydrogen cloud sequence disturbed by an encounter with a photon. The first three diagrams mark the start of a progression that continues in step with the periodic table. The stable clouds feature uniform cycles of uniform frequency. The cloud disturbed by the photon exhibits a modulation of cycle-pattern and frequency. The frequency of the photon, either incident or emitted, is the difference in frequency of the two cycles involved in the modulation. This scenario, generalized to the whole series of cloud possibilities, yields Bohr's formula for the spectral wavelengths of photons absorbed and emitted by the atoms.

Attached to periodic nodes of an electron cloud sequence is a *nuclear* sequence of higher frequency.[3] This constitutes a synchronization of nuclear and electronic frequencies. That is what gives the nucleus its location in the 4-D lattice. Larger clouds form around larger nuclei, which correlates greater cloud size to greater nuclear mass. On this theory, Einstein's 'curvature of space-time' is a global consequence of the local 'slowdown of time' correlated to local mass density. Such slowdown is depicted in the diagram by the stepped-up scaling applied to each successive cloud formation. The progressive expansion of hex cycles, from left to right in the series of cloud formations, constitutes a stepwise inflation of the underlying space-time metric. This relates the inverse square law of gravity to the inverse squares of Bohr's formula.

Counting the hex cycles of a sequence gives a reasonable measure of the total energy. Each time sequence is scaled so that 36 hex cycles span the height of the diagram. Thus the same amount of energy plays out in the same amount of time for any of the cloud formations. The result is a departure from the linear incrementing that one expects from an independent time axis. But proper time is not an independent axis. The hex cycles establish a proper time axis in conjunction with four axes of lattice quanta. We measure time along a proper time axis that increments as an integral component of local 4-D lattice propagation, such that cycles of equal energy transpire in equal time periods. If we don't take that into account, we misinterpret the non-linear

3. The cloud sequence diagrams do not show any nuclei. The quantum structure of the proton must be worked out in order to diagram, for instance, a complete hydrogen atom. Nevertheless, much can be learned about electromagnetism without knowing about the nucleus, as the historical development of physics testifies. I have found the likely structure of the nucleus, based on a time lattice with a different topology than the 4-D time lattice. See my paper "The Structure of Quarks," online at: http://step-in-time.spaces.live.com
Secondly, you can't count electrons in the cloud diagrams. Why is that? In the reduction to time, there are no particles, strictly speaking, but only quanta arranged in particle-like sequences. Conservation of electron-count is not an empirical law in the first place, and no one will ever *see* an individual electron. The inviolable identity of individual particles is lost in the reduction. The same holds true for the quarks and nucleons of the nucleus. What's gained is a consistent breakdown into quanta. For more details see my books *The Mind-Body Problem and Its Solution* (2004), and *A Theory of Everything for Physics* (2005).

growth of the proper time component as the deflecting work of forces that obey an inverse square law.

Quantum mechanics employs a set of four integers to specify the 'electron state' of an atom. The four integers are associated with four concepts tied to Newtonian physics: orbit number (Bohr orbit,) sub-orbit number, angular momentum, and up/down spin. If we set out to populate our cloud formations with quanta of charge and momentum, we foresee a limited range of available 'fill patterns.' The isolated hex cycle offers two 'slots' for charge and four alternative fill patterns, as shown previously. The number of fill patterns grows systematically with increasing cloud size. Such fill patterns provide an interpretation for the 4-tuples of raw numbers in Quantum Mechanics.

The topology of discrete time sequence is rich enough to formulate physics, simplify it, unify it, and endow it with the consistency of whole number arithmetic. Taking this theory as provisionally correct, we can then explore its consequences for philosophy and the scientific outlook.

2. Physicalism decommissioned

I shall use the term 'physicalism' to refer to the widespread belief that the world is mainly composed of non-mental entities. Physicalism is rooted in the common sense belief that physical objects such as rocks consist of inert matter. Such matter is not thought to depend for its existence on human minds, nor is it thought to have any mental characteristics of its own. The common sense belief in matter was incorporated into physics by Newton, who gave it rigorous definition and fundamental status in his system of matter-in-motion. This reinforced the common sense belief in matter, and insofar as matter-in-motion seemed to provide a sufficient conception of the physical world, such belief was called 'materialism.' Newton's physics proved to be defective in the long run, and his characterization of matter was part of that defect. Physics then shifted its dependence from matter to various substitutes, such as *fields* and *mass-energy* and *probability waves*. These substitutes served to redefine such objects as rocks without disturbing the gut-level conviction that such objects have no mental characteristics. The widespread acceptance of this *modified materialism* I am calling 'physicalism.'

The physicalist thinks of the physical world as extended in space, just as Descartes characterized it. Without recourse to such extension in space, he is unable to formulate any physicalist ideas. The inventory of spatially-conceived entities is wiped out by the brute reduction of physics to pure time sequence. There is nothing wrong with geometric conceptions in themselves – they just don't apply to a purely sequential physical world. Thus we may say that the geometric conceptions are 'decommissioned from service' in the theory of physics.

According to Richard Feynman, quantum physics is "crazy," and we need to become accustomed to that fact. Trying to make sense of physics is a quixotic goal that has brought human understanding to the end of its tether. Presumably, Newtonian physics was less crazy – a standard for comparison. The notion of matter-in-motion encapsulates Newton's theory nicely and presents little challenge to the layman. Now consider the theory of time sequence, which is even less challenging. It has but one concept that must be mastered – that of 'earlier-and-later.' We specified the logic of earlier-and-later on the first page of the physics section, and there was nothing "crazy" about it. There is nothing crazy about time not going backward. The concept of 'time order' is presupposed in the concept of 'motion,' so one cannot be comfortable with the latter concept and uncomfortable with the former. There is not a single new concept in the theory of time sequence, nor any non-standard logic, nor any novel mathematics. What defines and distinguishes the new theory is its *retention of time order to the exclusion of everything else*.

We all 'know the mind of the physicalist' because we all know how to conceive a rock as 'a lump of stuff.' Descartes made use of a piece of wax in order to bring his notion of physical existence into stark focus.[4] I have a rock in front of me right now, which fits nicely in the palm of my hand. As a physical object, it will serve just as well as Descartes' piece of wax. My rock is made of quanta. The constituent quanta of the highest frequencies connect to form the quark cycles of my rock. The quark cycles combine to form cycles of protons and neutrons, and these combine to form nuclei. The nuclei are interlaced with electron clouds to form complete atoms, which in turn combine to form molecules. The molecular patterns connect to form the rock. An arrow diagram of my rock would show how all its quanta are connected into a single elaborate sequence. The quanta themselves, I should emphasize, are not undefined. Each quantum is an irresolvable step of time sequence. My rock is a propagating time sequence, made of temporal transitions from one moment to another. As it is with the rock, so it is with my hand that holds the rock, my body, physical objects in general, and the universe as a whole.

The foregoing account rests upon the notion of quanta, which are unperceivable. The theory of quanta is *conjectural* in nature, as is the "crazy physics" of Feynman, or string theory, to take another example. Conjecture carries with it the risk of error. The craziness of contemporary quantum physics could be wrong, as could any theory that ventures to account for the unperceivable causes of our sensory data. The physicalist is under the innocent impression that he knows the essential nature of a rock in his hand from direct sensory perception *without having made any conjecture at all*. That innocent impression gives the physicalist a 'head start' in his pursuit of understanding the physical world. He is pre-equipped with the certainty that geometric shape and size are primary features of physical existence. But he is pre-equipped with the wrong topology, and his certainty is only psychological. He gets this wrong topology – spatial topology – from his own sensory data, which he cannot distinguish from the physical world, which he thinks he perceives. Thus he is stuck with a spatial conception of

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the world. It will take the dramatic and incontrovertible collapse of spatial states and spatial configurations in the theory of physics to make him rethink his assumptions about what is perceivable and what is not.

That which is perceivable is detailed in the study of *phenomenology*. Here we find everything that is missing from the theory of physics. There is no qualitative color in the theory of physics, but in phenomenology we find a description of the color solid, the gray scale, hue circles, primaries, complements, saturation, and so on. We find color instantiated in the spatially extended regions of a well organized two-dimensional visual field. We find visual size and shape. We find sound, with auditory qualities of pitch, loudness, tonality, and tempo. We sometimes find these sound qualities organized into melodies and music. We find the somatic feelings of touch, pressure, motion, and rhythm, organized into the relative locations of a "body plan," which is the body-as-felt. We also find temporal coordination among these discriminable sensory modes. We find intentions and ideas being entertained. We find odor and flavor. We find a lot.

All that we find in phenomenology, as I say, is missing from the theory of physics. The theory of time sequence shows just how 'thin' the subject matter of physics really is. Its subject is the time order of what happens in the universe. Physics sheds no light on the intrinsic nature of the discrete happenings, which are sorted into individual moments and relational transitions by sheer dialectical necessity. That sorting is enough to define time order, in terms of which, hypothesis and prediction are used to model and refine the temporal/causal structure of the universe. The predictions of physics must lead to perceivable results to do any good. 'Perceivable results' means sights and sounds in the phenomenology of a sentient human mind. Physical theory is concocted to improve the predictability of such sights and sounds. It has proved vital to incorporate theoretical, *unperceivable* entities into physics, to better predict the qualitative sensory data that we *do* perceive. With that development, physics becomes partially *non*-phenomenological. What begins as the supplemental addition of theoretical entities into physics, ends up as a theory referencing *nothing but* theoretical entities. The non-phenomenological component becomes all, so that physics and phenomenology end up with mutually exclusive domains of reference. This all began in earnest with Galileo and Newton, when the so-called secondary qualities were marginalized from physics. Now it is clear they are gone altogether. It is wrong, therefore, to speak of 'physical phenomena.' Physics is a hard-won predictive model for our sensory data. It is still in the making, proceeding by experiments that test the predictive power of this or that hopeful conjecture pertaining to the existence and arrangement of unperceivable entities.

The unperceivable entities of physics are either mind-like or not. Panpsychism holds that they are, and physicalism holds that they are not. Given the reduction of physics to just two primitive types of entity – temporal *moments* and temporal *transitions* – the question is narrowed as to whether these are mind-like or not.

The paradigm case of a mind-like entity is the human mind, which we can characterize as a temporal stream of phenomenological experience – the 'stream of consciousness.' To Descartes, it seemed clear that all things physical are spatially extended, while the mind subsists in time without being spatially extended. The mind is thus set apart from the physical world, *except for the common element of time itself*, which is native to both mental experience and the dynamics of physical bodies.

With the physics of time sequence as one's hypothesis, the seriality of human mental experience can be incorporated into the physical world as an integral part, since time is compatible with time. This was the gist of eventism for both Russell and Whitehead, inasmuch as the mind-body problem would be overcome. In that case, we would have moments of human experience implicated in the temporal/causal order with other moments, as yet uninterpreted, that serve the modeling needs of physics. Russell's term for the human moments is "mental events." Whitehead migrated to the term "occasions of experience." For either one of them, the question of panpsychism versus physicalism turned on whether or not *all* moments are like human moments – mental and experiential. Whitehead says yes, while Russell remains firmly noncommittal.

The key argument for panpsychism concerns the compatibility of human mental events with their immediate causes and effects. It has been a standing argument against mind-like entities that they are *unlike* the spatial entities of physics, so that causal interaction between the two is unintelligible. But now 'the shoe is on the other foot.' A time series of human moments is well suited to instantiate the causal order, while the remaining moments of physical theory have no specified attributes whatsoever. It is these latter moments that now stand in need of causal compatibility with mind.

The foregoing argument rests upon the validity of the proposed reduction of physics to time sequence. The reduction to time is best understood as a continuation of Newton's enterprising reduction to *space*, *time* and *matter*. Consider how Newton's theory accomplished the reduction of 'heat' to the motion of molecules. The physical theory of heat had first developed in accord with the assumption that heat is a primitive quantity without definition in terms of anything more basic. When Newton's theory was used to reformulate the physics of heat, it was eliminated as a primitive entity, replaced by the average kinetic energy of molecules in motion. That same type of reductionism – eliminate and replace – is carried further, and taken to the limit, in the reduction of the molecules and their motions to sheer time-ordered sequence.

Common sense realism in regard to the existence of the physical world is not jeopardized by the reduction to time. The electrons and photons, the rock, the brain, the planets, the galaxies – all these have their quanta and their mass-energy. None of it has any spatial extension, because the chaining of temporal transitions provides all the extensiveness that is needed. There can be no such thing as a physical *state* of instantaneous organization. What exists all-at-once is only each individual moment. Since each moment is generic and primitive, there is no specification of its 'state.' To make reference to a 'physical state,' such as a 'brain state,' is to 'freeze out time' and immerse oneself in the illusion of spatial extension.

Science today thinks in terms of 'big' and 'small.' Galaxies are big and quanta are small. These are assessments of spatial extent. They constitute a nasty distortion of the facts. Physical size and measure pertain to quanta, which have greater or less *duration*, which means they are relatively slow or quick. The quicker quantum has the greater energy, and the slower quantum has the greater time span. In a vast closed region, a single quantum could connect the earliest moment to the latest, spanning an eon of time. Such a quantum has feeble energy, but to think of that quantum as 'small' is to miss the fact that it spans a galaxy.

'Magic numbers,' 'God-particles,' and 'dark energy' are among the hopeful terms that physics uses to mark the holes in its understanding. The physicists admit that they do not know what a particle is, what mass is, or why particles have the masses they do. Feynman was one who strived to understand physics in terms of logically primitive concepts. Accordingly, he was bothered by the 'fine structure constant,' a raw number needed to make quantum electrodynamics work.[5] It is a magic number because it has no known derivation or interpretation. To have such a number listed among the ultimate constituents of the temporal world is tantamount to number mysticism, which is what bothered Feynman. The inclusion of even one magic number in a theory is enough to wreck any ontological interpretation of that theory. String theory requires many such numbers, perhaps an infinity of them. There are no magic numbers in the theory of time sequence, and no mystery as to how numbers apply to the physical world. Everything in the theory is countable, and any numbers are integers or ratios of integers. A non-rational number like *pi* is extraneous to the theory, as the theory has no circles or continuous curves.

Another magic number, one that Einstein called "my biggest mistake," is the Cosmological Constant of gravitation. That 'constant' is now known to shift in value as the universe ages. Physicist Rafael Sorkin has given an explanation of that shift in terms of "causal sets."[6] The theory of causal sets is formally identical to the theory presented here. Every diagram in this article is a diagram of a causal set. Sorkin and his group at Syracuse University have used causal sets to reformulate most of General Relativity. Causal sets are useful for calculating the Hawking radiation given off at the boundary of a black hole. Taken together, the quantum theory presented here, and the work accomplished in cosmology with causal sets, are complementary advances on two fronts of a single reductionism.

Fortified with confidence in the reduction of physics to time sequence, we can complete the decommissioning of physicalism. The entities of physics – moments and transitions – are *all time-like*. Human moments of sentient experience are well suited

5. The fine structure constant, once thought to be an integer, is now thought to be 137.036. The 'Honeycomb Series' of Figure 1 shows three cycles that are subsequently employed in chained repetition to diagram the cloud sequences. The smallest cycle of Figure 1, the single hex cycle, has 10 lattice arrows and can hold (as shown in Figure 2) up to 3 quanta in its proper time axis. The largest cycle of Figure 1, the helium cloud cycle, has 78 lattice arrows, and can hold up to 59 quanta in its proper time axis, for a total of 137. That is likely the fine structure constant in this theory, and I suggest that the discrepancy of .036 be re-evaluated in the native context and units of the new theory.

6. Read about causal sets at: http://www.einstein-online.info/en/spotlights/causal_sets/

to instantiate the causal order, and they provide the crucial sensory data required for empirical confirmation of physics. The remaining moments of the causal order thus stand in need of causal compatibility with the human moments, *so all moments must be mind-like*. That leaves the transitions to be considered. Each transition connects one moment to another. Since the moments are mind-like, direct relations between them are *also* mind-like. To suppose otherwise would be to inject incompatibility for no reason. Since all the primitive entities of this physics are best considered mind-like, panpsychism emerges as the more plausible doctrine, and physicalism drops out of contention.

3. The dominant monad

Regarding 'human minds,' I consider them to be discrete, countable, and each one serial. There is normally one human mind per human body. A notable proponent of discrete human minds, in the philosophical tradition, is Berkeley, who believed only in human minds and the mind of God, with no further minds involved, and no physical world. I shall treat one human mind as a series with a definite frequency. There are other series that are not human, and they might well have the same frequency as a human mind, but that alone does not make them 'human.'

If one person's sentient mind be considered a temporal series, then its analysis into momentary parts can take one of two paths. In a *continuous* series, there are an infinite number of moments between any two in the series, and with respect to any one moment in such a series, there is no *next* moment. On the other hand, a *discrete* series has a finite number of moments between any two, and the connection of moments is characterized by next-to-next succession. I argue for the latter, in order that a human series of moments be compatible with the discrete type of order that belongs to the physical world. Human moments can then be identified with selected moments in the theory of physics, appearing as normal junctions in the arrow diagram of the universe.

Our sentient experience of time seems to be smooth and without breaks. The best we can do to account for that smoothness, using discrete time analysis, is to model the human series as an unbroken alternation of 'moment, transition, moment, transition.' We then have a typical serial structure, constituted by moments and transitional quanta, which I nominate as 'human moments' and 'human quanta,' respectively. By itself, such a series is just like a photon of unknown frequency, and it represents a disembodied human mind. We are interested in the embodiment of such a mind in the immediate environment of its brain. This requires that the human series be joined by forking and convergence to other quanta of the brain.

The first order of business is to determine the frequency of the human series with respect to the other frequencies of physics. The free electron lies at the high end of electromagnetic frequencies. It is superseded only by the frequencies of the nucleus. Mind-brain interaction is electromagnetic activity, which ranges in frequency from that of the free electron at the high end, to frequencies as low as several cycles per second and perhaps lower. Psycho-physical experiment indicates that 10 Hz is the frequency of human mental states. Let us consider the experimental data.

The closest physical correlate to human sentient awareness is the brain wave activity at the cortical surface, recorded by EEG. Alpha frequencies in the neighborhood of 10 Hz accompany both the waking state of awareness and the state of active dreaming. Dreamless sleep is accompanied by slow rolling waves of several cycles per second. A brain dead patient is flat-lined, with no EEG activity. In the late stages of ALS, a patient can reach a 'locked in' stage, having lost the last vestige of voluntary motor control. The patient's mind is stranded, without even an eye-blink to communicate to the outside world. In such a case, the EEG is the only means by which a doctor can determine whether or not the patient's brain is still host to a sentient human mind.

The alpha frequencies are typically out of phase with one another, making a jumbled mess on the EEG record. A good meditator can bring the alpha frequencies into synchrony, producing a steady rhythm of coherent oscillation at 10 Hz. This is a remarkable clue to the frequency of mind-brain interaction. When we ask the meditator for an 'inside report' as to how the psycho-kinetic feat was accomplished, we hear that meditative practice is a progressive calming operation, effected phenomenologically and intentionally. This leads to a state of mind characterized by calm alertness and clear sensory awareness.

The concert of alpha rhythm measured by the EEG apparatus cannot be identified with the lone human series, which is too weak to be measured. Nevertheless, there must be some 'pacemaker' at work in the brain to orchestrate the alpha activity into a common beat or rhythm. The human series might serve as the pacemaker, or it might simply join in when the opportunity arises. In either case, it seems likely that the human series of moments transpires at a rate of 10 per second, connecting with other cycles of the brain that are nearby in frequency.

A stimulus probe on the visual cortex produces a spot in the subject's visual field. A *pulsing* stimulus, repeated at one location, produces a pulsing spot for the subject, *until the pulse rate exceeds 10 per second*. As that stimulus frequency is approached, the sensory spot loses its frequency altogether and becomes steady. Testing the frequency response of the other sensory modalities reveals the same 10 Hz limitation. The implication is that we cannot register changes faster than ten per second. The likely explanation: moments of human sentient awareness transpire at that rate and no faster.

A rate of 10-per-second for human moments is also appropriate to the delays involved in the conduction of efferent nerve signals from the brain to the muscles, and in the reverse direction, the conduction of afferent signals from the sense receptors to the brain. *Reaction time* – to avert a driving collision for example – is not reducible to less than one tenth of a second. Reliable motor control of the body requires patience for the feedback, which is subject to the propagation delays of neural transmission. The human series is well qualified for central control of the human body, equipped at 10 Hz with the ideal frequency for the job.

Strobe lights at 10 Hz bother people, and epileptics are prone to seizure when they see such strobe lights. All in all, given that we are seeking a finite frequency for the human series, a regular frequency of 10 Hz seems to be it. We are not aware of this frequency by introspection. It is ascertained only by reference to scientific hypotheses concerning a world that lies beyond the reach of anyone's introspective powers.

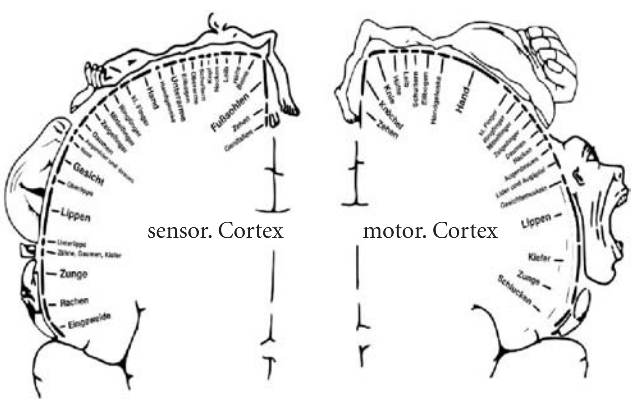
3.1 Location of the human series in the brain sequence

Brain scientists have mapped out a set of functional locations on the cortex called *projection areas*. These serve to pinpoint the location of the human series in the brain. The first two projection areas to consider are depicted by the 'motor homunculus' and the 'sensory homunculus,' which represent human-like forms that were first mapped out by Wilder Penfield.[7] The topology of the human body is preserved in these shapes, but geometric distortions of the 'little man' give him the appearance of a malformed fetus. You can stimulate the motor homunculus with a probe and get the corresponding part of the body to twitch into action, like operating a puppet. You can stimulate the sensory homunculus to shortcut the more remote stimulus that is normally needed on the surface of the body to achieve the same sensation.

Each moment of a human series has additional predecessors and successors that belong to the brain but not to the human series. Forking and convergence connect the human series to other cycles of the brain. Quanta that fork off from the human series to the motor homunculus provide control of bodily movement. Quanta from the sensory homunculus converge upon the human series, updating the body-image of somatic awareness. At cycles of 10 Hz, the sequence of cause-and-effect is as follows:

1. One human moment forks off to many moments of the motor homunculus.
2. Effects are propagated along efferent nerve routes to the muscles.

7. The drawing below appears in Penfield and Rassmussen, *The Cerebral Cortex of Man* (1950).



The figure is available online, courtesy of WikiMedia Commons, at the following URL: http://en.wikibooks.org/wiki/Image:Homunculus-de.svg#filehistory

3. Muscle action causes feedback signals along afferent nerve routes to the sensory homunculus.
4. Many moments of the sensory homunculus converge upon the next moment of the human series.

During the tenth of a second between the two bounding moments of the above cycle, one human quantum also transpires, propagating the human series. Compare the above with the following passage from Russell (1948):

> Consider now a single causal sequence, beginning with an external stimulus, say to the eye, continuing along afferent nerves to the brain, producing first a sensation and then a volition, followed by a current along efferent nerves and finally a muscular movement. This whole series, considered as one causal sequence, must, in physical space-time, occupy a continuous series of positions, and since the physiological terms of the series end and begin in the brain, the "mental" terms must begin and end in the brain. That is to say, considered as part of the manifold of events ordered in space-time by causal relations, sensations and volitions must be located in the brain. A point in space-time, following the theory to be developed in a subsequent chapter, is a class of events, and there is no reason why some of these events should not be "mental." Our feeling to the contrary is only due to obstinate adherence to the mind-matter dualism.

Both accounts describe the causal location of human mental events in the brain. My account is quantum-specific in locating a human mental event between immediate causal predecessors and successors. Neither account makes any sense if the brain and its cortical surface are conceived geometrically. The standard conception of a brain is one of instantaneous extension in space, with no earlier-and-later involved in its composition. That is a brain without quanta. Such a brain has no place in our physics. Taking Special Relativity into account, the cortical surface is a set of contemporaries – 'causal cousins,' related only by their causal ancestry. Such contemporaries are also poised to beget common causal descendants. The 'location of the mind in the brain' is resolved by tracing the causal lineage of human mental events to and from the homuncular regions. The homunculi on the cortex are the key causal locators of human mental events. This interpretation is *inconsistent* with the concept of a cortex as a surface of instantaneous spatial extent. Hence, prevailing wisdom attributes no significance to the homunculi.

Other projection areas on the cortex have also been mapped out, which correspond to other sensory fields of human phenomenology. Patterns of excitation at the retina are reproduced at the visual projection area. Auditory experience also has a patch of cortical surface devoted to it. A mental event typically involves all the sensory modes at once. The distinct phenomenal sensory modes correspond to the distinct patches of cortex devoted to the organs of sight, sound and touch. As with the sensory homunculus, the visual and auditory projection areas are home to causal predecessors of the human series. From those cortical sites, the afferent system converges to a human percept, at which point the efferent phase of causal sequence is renewed.

Let us consider visual experience and its patch of cortex. In phenomenal vision, we have a spatially extended field of colored patches. The colorful visual field is part of a human mental event. As is the case with color, the inherent geometry of the visual field is given to the subject of experience. We can judge with remarkable precision the size and shape of colored patches given in our visual experience. A good example is the extraordinary precision by which we can judge a rectangle to have height-width proportions of the 'golden mean.' This is pure phenomenology. The ancients could judge with the same accuracy. It owes nothing to science. It is a type of ratio measurement that involves no physicalistic conceptions or assumptions.

The visual projection area has a space-time metric based on *the second* as the standard unit of duration. Supposing the patch of visual cortex to be roughly circular and one inch in diameter, its space-like extent is approximately one-tenth of a nanosecond. The full spread of the subject's phenomenal visual field correlates to the full diameter of the cortical patch, so that half the visual field corresponds to half the cortical patch, or one-twentieth of a nanosecond. Proportionate size in the visual field is thus correlated to the metric unit of physics. This correlation is critical for an epistemological account of physical measurement, which requires sentient mental events in the laboratory, and sensory data that is phenomenally given to them.

The correlation of phenomenal measure to the nanosecond span of this or that cortical projection area is reliant on psycho-physical experiments. Perceivable sensory fields are correlated to the unperceivable domain of physics. In the case of hearing, it is *pitch* that correlates to the nanosecond span across the auditory cortex. We do not expand the domain of the perceivable by arriving at such correlations. They belong exclusively to the field of psychophysics, which correlates the qualitative data of subjective experience to the conjectural model of theoretical physics.

The human series has direct access to vision, hearing, and tactile information at the cortical projection areas. Such *direct access* to information is unambiguous in our theory of physics. It means that select moments of the projection areas are immediate causal predecessors of a human moment. Each such predecessor connects to the human moment by a single quantum. Conversely, *direct action* by a human moment upon some moment in the region of the motor homunculus means that a single quantum connects the human moment to the homuncular moment. The homunculi are situated on the cortical surface as if to provide convenient test points for a technician to troubleshoot the sensory and motor systems. In normal operation, they serve as staging areas for perception and control by the human series.

The stable brain is a propagation of synchronized time cycles, featuring a great range of frequencies and great variety of cycle topologies. The stability of human experience and its dependence on the brain means that the human series must be embedded in supportive cycles of 10 Hz frequency. These cycles provide a base of causal routine for the human series, and connect the 10 Hz series to the ladder of higher frequencies involved in brain function.

Conclusion

'Panpsychism' is a broad term for divergent doctrines as to the mind-like character of physical existence. I have argued that the reduction of physics to time sequence improves the prospects for panpsychism in general, over and against the default physicalistic view that predominates today. That is my main point in this article, and I am less concerned with discrepancies between competing versions of panpsychism. I will close with a summary of my own interpretation, which may serve as an example, and a foil for opposing views.

I think of each moment in the physical scheme as an 'occasion of experience,' to use Whitehead's term. Each occasion is host to its own phenomenological data. The arrow diagram of the universe is an 'inheritance map' or 'family tree,' showing the causal ancestry and lineage of each occasion with respect to the others. A human stream of awareness is a 'personal series,' forming a dominant line of inheritance. The chained repetition of human cycles propagates the dominant line of inheritance, accounting for the relative constancy of human experience over a modest span of time. The other moments and quanta of the human cycle are connected to the human series, but they are not parts of it. No moment is part of any other moment, and no quantum is part of any other quantum. Whole and part are unambiguous, and the primitive parts combine to make sequential structure. The overall connected structure is merely a history or genealogy of moments. All experience is localized in the moments – there is no 'group mind' to be ascribed to any structured whole. Neither is there any 'mind stuff' which coagulates to compose an occasion. Occasions are the only units of experience.

The patterned regularities of temporal succession are the laws of physics. Departures from regularity constitute the limits to law-like determinism. I see no 'necessity' attaching to the contingent patterns of time. Physics relies utterly for any success it might have on projected continuation of propagating patterns. Why do specific patterns persist and not others? The physicist describes *how* time progresses, making purely structural claims about patterns of time sequence. In asking *why* time makes the patterns it does, we are thirsting for a teleological explanation. Whitehead looks first to why human beings form societies, and he finds that societal organization leads to greater satisfaction of the members. Generalizing that insight to the relations that bind all occasions, moments form cyclic patterns of repetition for the same reason – to reap more satisfaction from a sharing arrangement with like-minded individuals. Just as *experience* is entirely localized within individual moments, so is the teleological element of *satisfaction*. The teleology of pattern formation is thus wholly attributed to the teleological nature of the individual moments and their direct inheritance relations to contiguous moments.

No moment is 'bigger' or 'smaller' than any other. I have ascribed a privileged role to human moments in the control of bodily behavior, but the cooperation of a great many non-human moments is presupposed. We are apt to take a parochial view of our own native frequency as 'just right' for the enjoyment of sane, coherent experience.

We have trouble granting experience to the moments of an electron because of their nanosecond quickness. But that pace is strictly relative to other frequencies. There is no absolute measure of duration. The pace of experience is 'just right' for the constituent occasions of any sequence, regardless of its frequency ratio to other sequences.

PART III

Metaphysics and mind

CHAPTER 13

Zero-person and the psyche

Graham Harman

This article addresses several closely linked issues: the mind–body problem, the relation between first-person and third-person descriptions, and panpsychism. Every approach to consciousness has its own way of addressing each of these questions, and the lines of battle are now firmly drawn and widely known. But while all three issues should be of great interest to any thinking person, I contend that each marks an artificial restriction on a broader underlying problem.

First, the mind–body problem is one small part of a more basic *body–body* problem, as found in the abandoned occasionalist tradition. On this point I will make two claims: (a) The occasionalist problem of interaction between any two entities has not been overcome, but was merely inverted by Hume and Kant without solving the problem. (b) Natural science also does not solve the problem of body–body interaction, but flourishes only by ignoring it. To hold that bodies interact by slamming together in space or responding to fields is to adopt a narrowly commonsense view of what interaction means. Thus, the inadequacy of materialism arises *not* from its inability to explain a special pampered entity called consciousness, but from its inability to balance its accounts in the physical realm. It ignores the problem of how relations arise between any two beings, and merely treats interaction as successfully calculable. One of its worthy goals in doing so is to draw mental facts back into the same sphere as physical ones, in a Galilean effort to unify the supposedly separate worlds of mind and body. This makes it an appealing alternative to dualism. Unfortunately, materialism leaves the nature of relations between bodies in obscurity. In this sense, it is less a metaphysics than a police action, offering a fairly bleak vision of the harmony that will ensue once the final obscurantist holdouts are crushed. Hence, the position defended in this article can be called 'physicalist' only if the term 'physical' is expanded far beyond the scope of the usual scientific conception of matter.

Second, there is something missing from the picture when we divide the world between first- and third-person descriptions. What is missing is not the second-person, which can easily be dissolved into the third-person, but rather what I will call the *zero-person* stance (the ordinal 'zeroth' is too awkward in English), which refers to the 'essence' or intrinsic nature of an entity apart from any access we might have to it. The problem shared by first- and third-person descriptions is obvious: namely, both are *descriptions.* Against any ontology in which things are reducible to a listing of attributes, I hold that the being of things is never commensurate with descriptions of any sort. Objects, in a broad sense including trees, protons, animals, cinder blocks, nations, humans, and fictional characters, are never exhausted by any possible manifestation. Hence, objects must be granted a zero-person reality that can only be *translated* into descriptive terms of the first- or third-person kind. Here we have yet another variant of the forgotten occasionalist problem, since human consciousness is stripped of its purported ability to exhaust apples and stars with third-person descriptions, and even of its purported ability to drink its own self dry by means of direct first-person awareness.

Third, there is need to replace the word 'panpsychism' with a more accurate term, even if the initial options are somewhat awkward. The one I will propose here is 'endopsychism,' though I reserve the right to replace it with a more mellifluous one in the future. Franz Brentano presaged the phenomenological movement by reviving the Medieval term 'intentionality,' in the sense of 'immanent objectivity.' All consciousness contains objects within itself as the focus of its acts. Now, Brentano was no panpsychist, and allowed only the usual limited range of entities to have consciousness. But this article contends that there is a universal interplay between: (a) objects in their concealed zero-person reality, and (b) the distorted first-person *or* third-person way in which these objects are encountered. This might seem to lead to a panpsychist version of Brentano, in which *all* objects (not just humans) have an inner psychic life focused on immanent objects.[1] Yet there is a slight problem with calling it panpsychism. I hold that Brentano is right to describe consciousness in terms of immanent objectivity, and also right that all consciousness must be occupied with such immanent objects. But *in what* are the immanent objects contained? Brentano simply assumes that they are contained in me the conscious agent, but this will turn out to be false. Both I the conscious agent and the immanent objects I confront are contained on the interior of a higher object, not on the interior of me. And this slight, strange modification alters the sense of the 'pan-' in panpsychism. 'To be conscious' means *to be in the interior of a larger entity,* but 'to exist' means only *to have an interior*, not to be conscious. In other words, there may be numerous entities that house others without residing in turn on the interior of higher entities, just as water at the surface of the ocean only has neighbors below it, and none above. But if psychism means to exist on the interior of a higher entity, and if there are entities that contain without themselves being contained, then the turbulent 'surface' of the cosmos at any given moment has no psychic life at all, even if all other entities do. In that case, innumerable 'inanimate' objects would turn out to have a primitive psyche, yet we would still fall short of a fully panpsychist vision.

1. David Skrbina, referring to my interpretation of Heidegger in *Tool-Being* (2002) was the first to propose that I should bite the panpsychist bullet: "Harman adds that 'the as-structure of human Dasein turns out to be just a special case of relationality in general. We ourselves are no more and no less perspectival than are rocks, paper, and scissors.' Yet Harman resists casting this interpretation in a panpsychist light.... [T]his raises the question of the relationship (if any) between 'psychic relations' and relationality in general." (Skrbina 2005: 181–182).

1. The body–body problem

One of the chief philosophical riddles of modern times is the mind–body problem, most familiar from the writings of René Descartes. How can two substances as different as mind and body ever interact? And how might a physical world of blind causal impact give rise to an apparent inner world of perceptions? While countless solutions have been proposed, there is a more basic opposition between those who accept that there is a mind–body problem in the first place and those who do not. The latter group finds its purest form in the *eliminativist* position, which goes so far as to deny that there is anything like inner experience or a self at all. This position is often described as the denial that there are *qualia*, immediate experiences that would be fundamentally different from the senseless impact of real physical things. It is generally countered by the insistence that experienced qualities are more real than anything else we know, and that such experience is irreducible to the blind interactions described by the sciences.[2] In short, there are those who accept the mind–body problem as a true conundrum, and those who wish to dissolve it by reducing the entire world to a question of bodies. A few scattered visionaries might still try the opposite reduction, turning everything into a kind of mental experience. But in our time they are vastly outnumbered by the legion of scientific materialists, who greatly exceed their rivals in self-confidence and institutional prestige.

Yet all of these groups share the assumption that no *body–body* problem exists. After all, the sciences already work in a body–body idiom, and apparently with great success. Descartes proposed that the realm of *res extensa* functions solely through physical displacement, rejecting the substantial forms and occult qualities of the earlier physics. In this way the superhighway to mechanistic theories of nature was built, and it has handled most serious intellectual traffic ever since. While the quantum theory may add certain complications to the mechanistic view of nature, it does not alter the basic model of physical entities slamming together in space or interacting with fields. There remain certain problems of calculation, of statistical inference, and of deducing the exact laws by which physical entities affect one another. But the basic features of causation are taken for granted, and have assumed an air of self-evidence that makes materialism the default intellectual position of our time. Anyone trying to deviate from this model will feel ceaselessly pulled upon by the claims of scientific mechanism. As a result, philosophy has been forced into a defensive posture: either worshipping the sciences and merely supplying commentary, or upholding the rights of a special inner sphere that the mutual impact of bodies cannot fully explain.

Since Kant, this situation has reached the point that philosophy now deals almost exclusively with the single relational drama between humans and world. It makes no difference whether we see an unbridgeable gap between these two realms (Kant), or

2. For a fine example, see Galen Strawson's "Realistic monism: Why physicalism entails panpsychism." (2006; and the present work.)

claim instead that they are fused together from the start (Hegel, phenomenology, pragmatism). Whether the relation between humans and world is an irrevocable divorce or a harmonious marriage, all philosophical energy is focused on this single point of relation. Most will admit that there must be relations between fire and cotton or comets and planets, no less than between humans and world. But these inanimate duels are generally excluded from philosophy's subject matter, unless they are inscribed in some sort of manifestation to humans. Such relations are left to the natural sciences. But if philosophy is to reclaim the universal subject matter that it was born to address, it cannot continue to leave the vast majority of relations outside its mandate. We need to reawaken a body–body problem ignored by the sciences, rather than defend the mind–body problem as the final citadel beleaguered by eliminativists streaming from Mordor.

The body–body problem is not unknown to philosophy, and was most prominent under the now ridiculed name of 'occasionalism.' Cordemoy and Malebranche expanded the Cartesian mind–body problem into a generalized problem of communication between all entities. Similar arguments had long been made in Islamic philosophy, from al-Ash'ari in Basra through al-Ghazali in Baghdad. Their motives were theological, stemming from the apparent blasphemy of granting any causal power to entities other than Allah. Hence, God became the sole medium enabling relations to occur. In today's Western intellectual climate, divine intervention is no longer a defensible explanation of causality; occasionalism has become a dusty footnote to history, mocked as superfluous even by undergraduates. It is sometimes remembered that such figures as Spinoza, Leibniz, and Berkeley also deprived individual entities of direct causal power and made them take detours through God. But this never amounts to anything more than an argument for the "great historical importance" of occasionalism, not for its relevance to us today. And while Spinoza, Leibniz, and Berkeley are still respected, their literal disciples are few. The reason is simple: Hume and Kant have established the horizon for acceptable versions of mainstream philosophy. Anything prior to Hume will usually look like dogmatic metaphysics of the old-fashioned variety.

Yet the occasionalist problem is not only relevant today, it even forms the enduring backbone of modern philosophy. It is little noted that Hume's position is merely an inverted form of occasionalism. The free-thinking Hume admired the writings of the arch-Catholic Malebranche because of their shared objection to the idea that causal relations can be directly observed. What we see are conjunctions and contiguities, not the workings of actual causal powers. Recall that for occasionalists, what was doubted was never the existence of individual substances, but only their ability to come into relation, which required that God be invoked as the global relational medium. But for Hume the situation was merely the opposite: the relations were already present in the form of custom or habit, and what was denied was that real causal powers could be known to exist outside the conjunctions we observe. From here it is a short distance to Kant, for whom cause and effect become human categories that never escape the bounds of experience.[3] What is common to all these positions is a model in which one special entity does what others cannot: for occasionalism, nothing creates links but God; for Hume and Kant, nothing creates links but human experience. Both groups raise the profound problem of how interaction is possible, but solve it hastily with either a *deus ex machina* or *mens ex machina*. And while it is all too easy for enlightened Western philosophers to chuckle at the notion of a hidden almighty divine cause, they merely defend the socially acceptable underbelly of the problem – letting the human mind serve as an equally almighty universal glue. In both cases, the metaphysics of the world is only allowed to play out in a *single* kind of entity. And while materialism manages to escape this deadlock and regain the full plurality of animate and inanimate relations, this comes at the cost of denying their highly problematic character.

Hume pleads ignorance as to whether there are real causal relations between real things, and Kant pleads even greater ignorance by turning cause and effect into human categories inapplicable to the things-in-themselves. However, today's philosophical mood is not really this sceptical in practice. Our *Zeitgeist* assumes that once we leave the sphere of human reality, interaction between bodies takes place without difficulty, so that the sciences can continue with their successful research projects, unhindered by philosophers. Materialists are granted their point about bodies, and merely denied access (by many) to the mysterious fortress of the mind. And here I must object. Admittedly, the divine solution of occasionalism solves nothing; its best weapon is a mere piety toward forbidden things that now holds little force in a Western context. Nonetheless, I still believe occasionalism is closer to the truth than the various positions inspired by Hume and Kant, in whose shadow all non-materialists continue to dwell. Stranger still, I became convinced of this point by an unlikely figure, one who appears to scorn all metaphysical speculation beyond the bounds of human existence: Martin Heidegger.

In the famous tool-analysis (whose appearance in 1919 predates the publication of *Being and Time* by eight years), Heidegger breaks with his mentor Edmund Husserl.[4] For Husserl, philosophy proceeds by bracketing the existence of any external world and setting up shop in a world of phenomena. I will say more about Husserl's virtues a bit later, but Heidegger's critique hits home. For as Heidegger observes, we do not normally encounter things by staring at them or describing them; this is an artificial special case forming a small portion of our lives. Most of our environment is silently relied upon until it malfunctions. The field of phenomena is a thin film or surface in

3. Everyone notes the difficulty that Kant says the noumena "cause" the phenomena even though cause is supposed to be a merely phenomenal category. What is almost never discussed is the question of causal relations *between noumena*. In fact, rejection of this topic is the secret shared assumption of most post-Kantian philosophy. Materialism "solves" the problem only by denying that inanimate entities are noumenal, thereby claiming that everything in the world is phenomenal, describable by qualities observed in the third person.

4. In Chapter One of *Tool-Being* I describe the tool-analysis at great length.

comparison with all those entities whose silent performance we take for granted: bodily organs, chemical structures, habits, linguistic abilities, floors and furniture. Insofar as these things function, they tend to remain unnoticed, withdrawn into shadow. Under the usual reading of the tool-analysis, we have a contrast between explicit theory (Husserl) and implicit practice (Heidegger), with Heidegger's view having the upper hand. This leads W. Teed Rockwell, among others, to identify Heidegger's theory with an earlier insight by John Dewey.[5] More specifically, Rockwell credits both Heidegger and Dewey with seeing that when I use the hammer, the hammer and I are one.[6]

This is a misreading, however widespread it may be. The point of Heidegger's analysis is not that Dasein and the hammer are one, but that they are fundamentally *not* one: their apparent unity is a merely temporary illusion. The reason the hammer can sometimes malfunction is because it is not reducible to Dasein's current use of it, and in fact holds many surprises in store. The point of the tool-analysis is not that praxis is richer than theory: the point is that the hammer itself is richer than both praxis *and* theory. To stare at a hammer is to reduce it to a limited set of surface-properties, but to use the hammer creates a similar caricature of its genuine being. Otherwise, there could be no such thing as a "broken hammer": the hammer would be entirely used up by its relation to practical Dasein. On the contrary, praxis is no better than theory at exhausting the reality of things, and this fact gives the tool-analysis a surprisingly *realist* force. This interpretation might seem at odds with Heidegger's apparently Kantian outlook, in which human Dasein stands at the center of reality, and even Newton's laws are said to be neither true nor untrue before they were formulated by Newton. Yet the realist strand of Heidegger's thinking haunts such anti-realist readings, as seen especially in the 1949 lecture on "The Thing."[7]

But we have not yet gone far enough, and must take an additional step that Heidegger himself never took. If we say that both theory and praxis fail to exhaust the reality of things, this makes it sound as though only human intervention turns things into caricatures, making Dasein a unique instrument of distortion in the cosmos. A human who looks at a rock or uses it to smash other objects would be responsible for converting the rock's reality into a present-at-hand image of this reality, but a rock slamming into another rock would supposedly do no such thing. Yet this view cannot

5. W. Teed Rockwell, *Neither Brain Nor Ghost* (2005). On page 189, Rockwell says that Dewey made Heidegger's distinction between readiness-to-hand and presence-at-hand "thirty years earlier." On page 180 he states: "I think it is important to give credit where it is due. It was Dewey, not Heidegger, who first said that the problems of modern epistemology arise from assuming that one can have Dasein without Being-in-the-world, although he said it in less technical language..."

6. Rockwell, p. 146. "Insofar as we are at home in the world, and what we encounter is ready-to-hand, we *are* the world."

7. Heidegger, "Einblick in das, was ist," in *Bremer und Freiburger Vorträge*. GA Band 79. (1994; Frankfurt: Vittorio Klostermann).

be maintained. Each of the rocks has countless qualities in its own right; obviously, most of these do not come into play in any given collision. Hence, one rock smashing another will encounter nothing but a distorted rock, a 'straw man' rock, just as would be the case for human theoretical or practical agents. If anything, one rock is likely to reduce the other even more obtusely than would relatively flexible and open-minded human beings. Relations per se are always a *translating* force, always giving us something a bit different from that to which they relate.

The real problem is not the opposition between things and human access to them, as the models of Descartes, Hume, and Kant all suggest. Instead, the problem is the opposition between any two entities at all. The single pampered modern rift between human and world (whether stubbornly retained or heroically bridged) gives way to trillions of rifts between all beings in the cosmos. There is a universal body–body problem, and the mind–body problem is only one of its tiny subsets, though admittedly one of special interest to those who have minds. Heidegger never saw quite this far: even his most realist moment (in 1949) in which a jug stands in itself apart from all human access, usage, science, or production, tells us only that the jug itself hides *from human Dasein*, never from other things.[8] Having scoured the whole of Heidegger's *Gesamtausgabe* as of 2008, I can assure the reader that he never offers a single example of two inanimate things smacking together without Dasein conducting surveillance on them. In this way, Heidegger remains within the Kantian Dual Monarchy of human and world. His assertion that they always come as a pair, via the unified term 'being-in-the-world,' merely mends the rift without replacing it. Human and world are always the two terms that are linked. It is never a matter of 'bridging the gap' between wind and tree, or offering a primal correlation of hailstones and corn. Yet Heidegger could and should have taken this further step. The tool-analysis provides immediate incentive to revive the occasionalist body–body problem, and this time without theological baggage. No relation to a thing can exhaust it, whether it be theory, praxis, or blind causal interaction. No external model of a thing can drain it to the dregs, and this is true not only of our conscious experience, but also of such lowly entities as dust and wheat. But though I propose to revive the problem of occasional causation, I do not wish to revive this precise *term*, which remains too freighted with theological baggage. Hence, I have often suggested 'vicarious causation' as a suitable phrase. Any two entities must interact vicariously, by way of a third. And just as importantly, *any* entity can serve as such an intermediary – not just God or the human mind.

Here, someone might ask how we can know that there are objects above and beyond their phenomenal accessibility. We cannot respond simply by appealing to the authority of Kant, who famously finds it absurd that there could be appearances without anything that appears. This argument by Kant is not highly esteemed by today's readers; indeed, it is often seen as a naïve maneuver subject to easy rebuttal, and marked by the flavor of a dated, traditional style of reasoning. This is how it was viewed

8. Ibid.: 6–9.

by his prestigious successors, the German Idealists. By making the supposed difference between appearance and reality internal to appearance itself, it is easy to produce an idealist philosophy that dispenses with the supposed phantom of the *Ding an sich*. Furthermore, those who do accept something outside appearance can make a different sort of objection: even if a real world is there, why not view it as a single unified lump that is broken into pieces only by mind? This already happens in pre-Socratic philosophy with Parmenides and Anaxagoras. It even happens in more recent cases, such as the lucid treatise *Existence and Existents* by Emmanuel Levinas (2001), whom I regard as Heidegger's greatest interpreter. For Levinas, being itself is a rumbling *il y a* ("there is") without parts, which is then *hypostatized* into parts by the human observer.

Nonetheless, these positions merely disagree as to whether the number of realities-in-themselves is zero (idealism) or one (Parmenides, Levinas). Both agree that there is no plurality of things apart from human access. Despite their obvious differences, both positions claim that *specific* realities are entirely exhausted by their relation to us, with nothing lying in reserve. Hence, they endorse a permanent correlation between human and non-human reality, with neither existing apart from the other. Quentin Meillassoux (2008a) describes all such views with the marvelous term "correlationism."[9] For the correlationist, there is no human without world and no world without human, but only a primal correlation or rapport between the two. In other words, both humans and world are fully deployed in their mutual relationship. As a variant of this position, we could point to a less human-centered version that might be called 'relationism,' as found most lucidly in the works of Alfred North Whitehead and Bruno Latour. Relationist philosophies do not agree that a human must be involved in every relation, but still insist that things are the sum total of their relations to all other things, and nothing more.

This gives us three possible stances against the plurality of hidden things-in-themselves (personified nicely by Fichte, Levinas, and Whitehead). All of these positions all face the same two difficulties. All agree that individual trees are exhausted by being *given* as trees, with Whitehead simply adding the complication that trees are not only given to humans. But let's imagine a counterexample in which other perceivers are added to the situation. New observers now enter the scene and perceive the tree, each in his, her, or its own way. Now, what these observers will be perceiving in each case is *the tree*, not the earlier observers' *perceptions* of the tree. This counterfactual case gives a first reason why a thing cannot be exhausted by the current perceptions or prehensions that other things have of it. The second reason has to do with change. If all entities in the world were fully determined by their current relations with everything else, their reality would already be fully deployed. There would be no principle of dynamism in the world if nothing in the things were withheld from current expression, no surplus of reality outside all current states of affairs. For this reason Merleau-Ponty

9. Meillassoux (2008a). However, Meillassoux does not *reject* correlationism so much as attempt to radicalize it into an absolute knowledge that the laws of nature must be contingent. See his remarks on this point from pages 408–435 of *Collapse* III (2007; Falmouth, UK: Urbanomic).

(1945/2002:79) misses the point when he states, with a false revolutionary air, that a house is not a house viewed from nowhere but a house viewed from *everywhere*. On the contrary, a house is simply not a set of outer perspectives on it by other things, no matter how many such perspectives we might tally up.

This brings us to the sole feasible alternative: the world is home to a vast number of objects, and there is a communication problem between all of them, since all partly withdraw from their manifestations to other things. Instead of the lonely, pampered mind–body problem with its special elitist features, we now have a universal body–body problem between all entities. The body–body problem trumps the Hume-Kant view by stripping monopoly rights from the human-world gap and introducing a global rift between all things. It trumps materialism by insisting that there really is a communication problem between entities. It trumps the standard occasionalist view by saying that God is not a sufficient answer, since God ought to have the same relational problems as every other entity does. It even trumps today's chic philosophies of 'the virtual' by denying that individuals exist only at the surface of the world, and by rejecting the shell game of claiming both that the virtual is pre-individual *and* that it is made up of different pre-individuated zones. This really amounts to saying "the virtual is both one and many, and hence there is no communication problem." But this merely posits a solution by fiat, while solving nothing.

To summarize, I recommend a fresh embrace of the body–body problem, of the view that objects have individual character (a.k.a., 'substantial forms') prior to any relations. All objects must solve the communication problem in precisely the same way, with no special diplomatic immunity for God or the human mind. As a consequence, we no longer need to defend the lonely stockade of the *cogito* against the materialist Golden Horde, since the materialists do not even get bodies right.

2. First-person, third-person, and zero-person

The mind–body problem is often equated with the need to reconcile first-person and third-person descriptions. The difficulty is that first- and third-person descriptions are both *descriptions*, and a body is no more a sum of descriptions than a mind is. A body exists. It cannot be exhausted by the sum total of things we say about it, because these statements would not be able to step in for the thing and do what it does, or be what it is. Nor can a body be exhausted by any set of relations, no matter how large. For this reason I will coin the adjective 'zero-person' to refer to the reality of any entity apart from its interactions with other entities of any kind. This changes the nature of the problem. Instead of trying to bridge the gap between two kinds of descriptions, we now have a gap between description and reality.

Note that the first- and third-person standpoints are essentially the same thing. There are no third-person views without some entity doing the viewing; conversely, it is unthinkable that there could be a pure stream of first-person experience without something dancing before us in the third person, even if it were nothing but imagined sparks of light, or vague and rambling urges. A body is never equivalent to what can be said or noticed of it in the third person, nor is mind the same as what is noticed of it in the first person: both mind and body occupy the zero-person stance, quite apart from any experience of them. The gap that needs to be explained lies not between an external third-person and an internal first-person experience, but between the reality of mind or body, and the access to them by whatever might encounter them.

Now, a possible synonym for 'zero-person' would be *essence*. While essence is viewed with suspicion in much recent philosophy, there is nothing mystical or naively traditional about it. Something has an essence simply because it is what it is. To describe a thing's essence seems possible to some extent, but no set of descriptions will be able to replace it. For instance, a perfect list of all the properties of a house, and of all possible relations that other entities might have with it, do not yet add up to a house. Georg Cantor's insights into transfinite numbers even suggest that we cannot have a total set of all properties of the house, which strengthens the hand of the zero-person stance all the more. Nor is the house reducible to its potential to affect other entities: a thing may be known or detected through its causal power over other things, but is not identical with those powers. This immediately revives the classical problem of which things really have an essence, and which are mere aggregates of smaller real things – a problem that cannot be solved in the present article, though I will address it briefly below.

Obviously enough, most approaches to consciousness do not make use of the global duality I have proposed between zero-person reality and descriptions of whatever sort. They overlook this theme thanks to assumptions that can easily be refuted, and by paying attention to themes (such as first-person vs. third-person) that ought to be repackaged in more fundamental terms. As an example of some of these problems, I propose to examine some of the basic theses found in one widely known work in the field: *The Conscious Mind* (1996), by David Chalmers. Regardless of the reader's views on Chalmers, he provides a useful foil for the zero-person stance, since his ontology is not only quite different from the kind I propose, but also makes a strikingly close approach to the universal opposition between objects and relations that I wish to defend.

The core of his argument can be found in his distinction between "logical supervenience" and "natural supervenience." For Chalmers, almost everything is logically supervenient on the physical (p. 71). For a higher-level fact to supervene logically on a lower-level one means that there is really nothing more to it than was already included in the lower level.

> In general, when B-properties supervene logically on A-properties, we can say that the A-facts *entail* the B-facts, where one fact entails another if it is logically impossible for the first to hold without the second.... In a sense, when logical supervenience holds, *all there is* to the B-facts being as they are is that the A-facts are as they are. (p. 36)

Logical supervenience goes hand-in-hand with reducibility:

> [F]or almost every natural phenomenon above the level of microscopic physics, there seems in principle to exist a *reductive explanation*, that is an explanation wholly in terms of simpler entities. In these cases, when we give an appropriate account of lower-level processes, an explanation of the higher-level processes falls out. (p. 42)

He does add a caveat:

> [But] a reductive explanation of a phenomenon need not require a *reduction* of that phenomenon.... In a certain sense, phenomena that can be realized in many different physical substrates – learning, for example – might not be reducible in that we cannot *identify* learning with any specific lower-level phenomenon. But this multiple realizability does not stand in the way of reductively *explaining* any instance of learning in terms of lower-level phenomena. (p. 43)

This proviso turns out to be irrelevant for us, since for Chalmers learning has a purely "functional" sense. While the different possible physical substrates of learning make it impossible to *identify* learning with specific lower-level constituents, learning can still be reduced in the other direction. Namely, many different substrates of "learning" can amount to the same thing because of their similar effects. Chalmers holds that *almost everything* in the world can be reductively explained. He cites the example of biological phenomena such as reproduction, adaptation, and even life itself. "Once we have told the lower-level story in enough detail, any sense of fundamental mystery goes away: the phenomena that needed to be explained have been explained." (p. 42). And "a reductive explanation is a *mystery-removing* explanation" (p. 48) that turns a mystery into a mere *puzzle*.[10] Chalmers does concede that a reductive explanation is not always illuminating: to reduce the great 2004 tsunami to molecular motions is possible in principle, but would not be pitched at the right level to be very helpful.

But for Chalmers, consciousness is a special case. It is not reducible as physical phenomena generally are, and this makes it a rare and genuine mystery: "the existence of conscious experience seems to be a *new* feature.... It is not something that one would have predicted from [the lower-level features] alone." (p. 4). And "if logical supervenience fails (as I will argue it does for consciousness), then *any* kind of reductive explanation fails, even if we are very generous about what counts as explanation." (p. 50). Yet along with logical supervenience, there is also *natural* supervenience. For instance,

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10. Ibid.: 24. Chalmers's use of the word 'puzzle' immediately brings to mind Thomas Kuhn's famous idea of puzzle-solving "normal science" in *The Structure of Scientific Revolutions*. But the difference between their respective views of 'puzzles' is itself illuminating. For Kuhn, puzzle-solving science is opposed to paradigm-shifting scientific revolutions, so that puzzles can give way to paradigm shifts at any time and in any subject matter. For Chalmers, by contrast, puzzle-solving has permanent methodological rights over almost the whole of the cosmos, with only a few fixed areas (consciousness, or causal laws) retaining a certain autonomy and mystery. It should be obvious that Kuhn's vision of science is more dynamic than that of Chalmers.

> [T]he pressure exerted by one mole of a gas systematically depends on its temperature and volume according to the law $pV=KT$, where K is a constant. . . [However,] this supervenience is weaker than logical supervenience. It is *logically* possible that a mole of gas with a given temperature and volume might have a different pressure; imagine a world in which the gas constant K is larger or smaller, for example. Rather, it is just a fact about *nature* that there is this correlation. (p. 36)

Borrowing an image from Saul Kripke, Chalmers (p. 40) quips that once God created the universe with its microphysical facts, all the logically supervenient facts came automatically as a free lunch, but that God had further work to do to create naturally supervenient (and hence "mysterious") facts such as consciousness and causal laws.

When Chalmers says that almost everything in the universe is logically supervenient on the physical, he means that almost everything can be reduced to either its "structural" or its "functional" properties. For him, a mid-sized object such as a table has no autonomous reality, but only a structure and a function. In structural terms, a table needs to "have a flat top and be supported by legs." But such terms as 'flat top' and 'legs' are obviously rather crude, parochial examples of structure. A flat top is flat only for entities of a relatively large size, while bacteria encounter the tabletop as a landscape cratered with pores. Most of our loose examples of "structural" properties turn out to be purely functional. Hence, when Chalmers says that "structural properties are clearly entailed by microphysical facts," what he means is that microphysical facts are the only real structure the physical world has. In other words, the ultimate structure of a thing comes from the basic particles of which it is composed. This claim is more perplexing than it might seem. After all, Chalmers has no better idea than the rest of us what these fundamental particles might be (fifty-year-old quarks and century-old electrons are merely the limit of current physics), nor does he give any reason for holding that such ultimates must exist in the first place. Elsewhere in the book, Chalmers is openly critical of those who hope to explain consciousness through the possible future achievements of physics, yet he shows the same faith in physics here, reducing almost everything to functions, other than the "microphysical" structural facts in which he straightforwardly believes.

In functional terms, the fact that something is a table means that people use it to support various objects. For Chalmers as for most others, the functional means the *relational*; the ability of the table to support objects, just like its flat surface and possession of legs, is something real only for the other beings that encounter it. Objects pass the buck of reality down to their tiniest microcomponents; the table has no features in its own right *qua* table, but is merely a functional figment produced from the outside. Its structure comes from beneath (basic particles), and its function comes from above (those who use it). The table is thus reducible in two separate directions, and once this happens there nothing is left. Other than a few briefly described exceptions that need not concern us here (such as "indexicality"), Chalmers ends up with a rather sparse ontology: "almost every phenomenon is reductively explainable [i.e., expressible in terms of structure or function]. . .. except for conscious experience. . .. along with the rock-bottom microphysical facts and laws, which have to be taken as fundamental."[11] Generally speaking, he holds that everything real is either a physical particle or law (both describable in the third-person), or it is conscious experience (describable only by first-person qualitative "feels"). Although he later ascribes consciousness to such offbeat entities as a thermostat, this merely widens the number of beings permitted to have mind, and does nothing to expand Chalmers's basic roster of ontological personae. Other than particles, laws, and consciousness, nothing has reality in its own right. My claim, by contrast, is that the cosmos is riddled with autonomous entities at every level, and that they are reducible neither to microphysical structure nor to functional/relational use.

But Chalmers anticipates my objection:

> A frequent response is that conscious experience is not alone. . .. and that all sorts of properties fail to supervene logically on the physical. It is suggested that such diverse properties as tablehood, life, and economic prosperity have no *logical* relationship to facts about atoms, electromagnetic fields, and so on. (p. 71)

He responds as follows:

> [O]n a careful analysis, I think it is not hard to see that this is wrong, and that the high-level facts in question are. . .. logically supervenient on the physical insofar as they are facts at all. Conscious experience is almost unique in its failure to supervene logically. (ibid.)

Chalmers concludes that "the relationship between consciousness and physical facts is different *in kind* from the standard relationship between high-level and low-level facts." (emphasis added). His ten-page analysis of the issue hinges entirely on a point already discussed: "most high-level concepts are not primitive, unanalyzable notions. . .. [insofar as] their intensions can be seen to specify *functional* or *structural* properties." (p. 81; emphasis added).

Two names that Chalmers uses to describe his own position are "naturalistic dualism" and "nonreductive functionalism." These phrases mean the same thing. Naturalistic dualism is dualistic because it does not allow consciousness to be reduced to the physical, but at the same time it is "naturalistic because it posits that everything is a consequence of a network of basic properties and laws, and because it is compatible with all the results of contemporary science." (p. 128). Nonreductive functionalism likewise points to the dual sense of a consciousness that arises from the physical while still being something fundamentally new. Chalmers's brand of functionalism denies "that the playing of some functional role is all there is to consciousness, or all there is to be explained. Rather, it is a nonreductive account, one that gives functional criteria *for*

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11. Ibid.: 88. Since Chalmers holds that consciousness and causal laws are the only two genuine realities in the cosmos aside from brute basic particles, he muses further that "it is not unnatural to speculate that these two [logically] nonsupervenient kinds, consciousness and causation, may have a close metaphysical relation" (p. 86). This has consequences that will concern us a bit later.

when consciousness arises." (p. 229; emphasis modified). Standard reductive functionalism holds that something is conscious when it *behaves* in conscious terms, displaying all the outward symptoms and effects that one expects of a conscious being, and for reductive functionalism there is nothing more to be explained than this. But this runs afoul of Chalmers's favored thought-experiment of the *zombie*: a being in another universe identical to me in all physical and behavioral respects, but lacking any conscious experience. (pp. 94–99). Reductive functionalism effectively treats us as zombies reducible to our outward functions. By contrast, Chalmers holds that consciousness is different from all its outward manifestations, though without being independent of the physical conditions through which it arises. It is dependent on the physical ("naturally supervenient"), without being reducible to it ("logically supervenient").

In the course of developing this position, Chalmers argues against numerous opposing views. But there are two alternative positions that he treats with an especial degree of respect. One is panpsychism: "we ought to take the possibility of some sort of panpsychism seriously: there seem to be no knockdown arguments against the view..." (p. 299). His relationship with panpsychism, as for so many of us, is a sort of unconsummated flirtation, though Chalmers is more open to consummation than most. Yet even if he were to accept panpsychism, it would not threaten his dualism, since it would merely allow thermostats and other strange entities to join humans, monkeys, and dolphins on the roster of conscious beings. While this would be no small gamble in the current intellectual climate, the basic dualist picture would remain. Hence, the more threatening rival that shadows Chalmers is a speculative metaphysics of hidden protophenomenal essences. That is to say, dualism might be challenged with the following point:

> [T]o claim that the zombie world is *physically identical* to ours is to misdescribe it.... [Namely,] the zombie world *seems* physically identical [despite] being physically different.... there are properties essential to the physical constitution of the world that are not accessible to physical investigation. (pp. 134–135)

Chalmers notes that this latter position echoes the neutral monist views of Bertrand Russell in *The Analysis of Matter* (1927), which Chalmers (p. 153) glosses as saying that "physical theory only characterizes its basic entities *relationally*, in terms of their causal and other relations to entities. [Even] basic particles.... are largely characterized in terms of their propensity to interact with other particles." For instance,

> reference to the proton is fixed as the thing that causes interactions of a certain kind, that combines in certain ways with other entities, and so on; but what is the thing doing the causing and the relating? As Russell notes, *this is a matter about which physical theory is silent*. (ibid.)

While Chalmers (p. 136) is correct that this position would still be much closer to dualism than to materialism, it would completely change the terms of the duality. Instead of a difference between first-person qualitative feels and third-person descriptions of physical matter, there would be a difference between nonrelational protophenomena and their relational manifestations. Both first-person and third-person descriptions would have to fall on the latter side of such a rift, since we do not exhaust our own reality in introspection any more than a proton is exhausted by our description of it, or even by its interactions with other particles when no one is looking. We also need to ask why only tiny particles should be granted a cryptic protophenomenal reality, rather than extending this gift to bulkier objects as well. Why should *physical* structure always be reducible to its microphysical basis, as Chalmers assumes?

A bit more can be said about this. What Chalmers envisions is a theory of consciousness that will give us "psychophysical laws" irreducible to more basic physical ones. These laws will have a certain "brute" aspect that describes the workings of any sort of mind in our universe. If this bruteness of the psychophysical realm sounds disappointing, Chalmers reminds us that it is no different with

> the theories that physics gives us of matter, of motion, or of space and time. Physical theories do not derive the existence of these features from anything more basic, but they still give us substantial, detailed accounts of these features and of how they interrelate.... They do this by giving a simple, powerful set of *laws* involving the various features.... (p. 213)

More generally, "in science, we never get something for nothing: something, somewhere, must always be taken for granted.... So be it. That is the price of constructing a theory." What is interesting here is the claim that we are left with nothing to talk about but *laws*. Laws express relations between entities. Notice that for Chalmers there could be no such thing as "laws of tables," since these could be re-expressed either as structural accounts of how a table is an aggregate built up out of miniature physical particles, or functional laws of how the table can be used by people and cats. This would not be the case for such realities as consciousness, matter, motion, space, and time. These must be taken for granted because they are real entities, "part of the basic furniture of the universe," unlike non-basic furniture such as wooden or plastic tables.

One point of tension is as follows: while Chalmers usually regards only physical particles, consciousness, and laws as basic furniture, there are two occasions when he uses James Clerk Maxwell's discoveries as analogies for the absolute novelty of consciousness. Chalmers recounts that after numerous failed attempts to explain electromagnetic phenomena in traditional mechanical terms,

> features such as *electromagnetic charge and electromagnetic forces* had to be taken as fundamental, and Maxwell introduced new fundamental electromagnetic laws.... *In the same way*, to explain consciousness, the features and laws of physical theory are not enough. (p. 127; emphasis added)

The oddity here is that electromagnetic charge and force are admitted as new sorts of objects with the same degree of surprising novelty as consciousness itself, irreducible to more basic physical mechanisms. To me at least, this seems to open the floodgates and allow for novel objects on countless different layers of the universe. Chemistry and geology also have brute laws pertaining to the sorts of entities with which these sciences are concerned – laws that "could not have been predicted" just by knowing all the facts about quarks and electrons. Chalmers would probably counter that chemical and geological entities can still be reduced, in principle, to lower-level physical explanations based on microparticles. But the problem here is that electromagnetism can itself be reduced to an "electroweak" force, following the Nobel Prize-winning work of Glashow, Salam, and Weinberg. Pushing even further, some future theory may well unify the electroweak and the strong nuclear force with gravity, as expressions of an even more fundamental layer of reality. Pressing even further, the philosopher Kasimir Twardowski imagined a general metaphysics of objects to which both material and imaginary objects could be reduced. Hence, it is unclear why Maxwell's electromagnetic realities receive a special status not granted to other non-basic, non-mechanical entities.

My purpose is not to attack Chalmers's understanding of science, which is apparently solid throughout the book. Rather, I simply wonder why he conflates 'autonomous' with 'physically fundamental.' Gravity remains a relatively brute fact in our own time, and is also an autonomous subject matter with its own laws and its own basic entities (masses, and since Einstein curvatures of space-time as well). But the brutality and the autonomy of gravity *are not the same thing*, since the former would disappear with a future scientific revolution, while the latter may or may not disappear in such a case. Geology would not be considered a 'brute' realm for Chalmers any more than a table, since both would be reducible to a tinier microphysics – yet both geology and the world of tables have their own autonomous entities and laws, even if larger-scale ones than nuclear physics. And though Chalmers is committed to the dubious idea that a given subject matter must be "fundamental" in order to be filled with its own autonomous personae, he makes a bad gamble by citing such examples of "fundamental" realities as mass, space, time, force, and charge. Quite obviously, the fundamental character of these realities is as open to further reduction and unification as the formerly basic proton was once we learned it was made of quarks. Demanding that a thing be "rock-bottom" in order to be real is too heavy a price for any ontology to pay. The world of Chalmers is disturbingly devoid of layers, giving us a physical model in which everything of greater than microscopic size is dismissed as a crude functional metaphor. This eventually creates severe problems for his version of dualism.

But let's return to the theme of nonreductive functionalism, where all these issues come to a head. Despite his objections to materialism, Chalmers remains committed to naturalism: consciousness may be mysterious, but it is not a spooky property that comes from nowhere, entirely unrelated to matter. And neither does it arise from some currently unknown *physical* X-factor. Rather,

> a natural suggestion is that consciousness arises in virtue of the *functional organization* of the brain. On this view, the chemical and indeed the quantum substrate of the brain is irrelevant to the production of consciousness. What counts is the brain's *abstract causal organization*... (p. 247; emphasis added)

Since the specific physical substrate of consciousness is irrelevant, all kinds of strange media might give rise to consciousness if their abstract causal organization were of the right kind. Among other things, this leads Chalmers to defend strong artificial intelligence, which might come as a surprise given his public image as a holistic, anti-materialist bohemian. Without a trace of irony, Chalmers (p. 251) openly holds that "the organization of our brain might be simulated by the people of China," with every Chinese citizen using radio links to mimic the functioning of neurons. If it sounds bizarre that such a rickety arrangement might lead to consciousness, Chalmers counters that "it is equally intuitively implausible that a *brain* should give rise to experience!" He faintly implies that Searle's famous "Chinese Room" might be conscious (p. 314), and openly entertains the notion that a thermostat might be, though he admits it would probably not be capable of thought or self-consciousness. (pp. 293–297).

This model bears directly on both of the neighboring theses that stalk Chalmers through his book: (a) panpsychism, and (b) the metaphysics of hidden essences. This becomes especially clear in his idea of consciousness as an information-processing system. Borrowing Bateson's slogan that "information is a difference that makes a difference" (p. 281), Chalmers gives an intriguing account of information as *abstraction*. When light strikes our eyes and activates cells in the retina,

> three varieties of cones abstract out information according to the amount of light present in various overlapping wavelength ranges. Immediately, many distinctions present in the original light wave are lost.... The system cannot report 'This patch is saturated with 500- to 600-nanometer reflections,' as all access to the original wavelengths is gone. Similarly, it cannot report about the neural structure, 'There's a 50-hertz spiking frequency now,' as it has no direct access to neural structures. The system has access only to the location in information space. (pp. 289–290)

This leads to an interesting conclusion: "it is information that plays the key role. It is *because the system has access only to information states* that the various judgments of brute 'qualities' are formed." (p. 292; emphasis added). Information is described as having a "double aspect," since both phenomenal and physical realities can be seen in informational terms. This is true not only for the phenomenal realm of vision and other such abstractions. It is also true in the physical realm, thanks to Chalmers's interpretation of Claude Shannon as saying that "information is always a *transmittable* state." (p. 282; emphasis added). While he admits that this principle is merely implicit in Shannon's work, it seems convincing enough that transmitted information about physical states will always amount to a *translation*, and that translation is always a kind of abstraction or distortion. Hence, both the physical and phenomenal realms can be described in informational terms, and this obviously suggests a powerful means of linking them.

In fact, "we find information everywhere we find causation. We find causation everywhere, so we find information everywhere. But surely we do not find experience everywhere?" (p. 293). We now arrive at Chalmers's well-known panpsychist moment. Though he considers the possibility that only certain *kinds* of information might yield experience, this sounds like an artificial shield against panpsychism, and Chalmers does not shy away from entertaining a more dramatic option. Since information is ubiquitous, it may follow that "experience is ubiquitous too." Among the many virtues of panpsychism, one is that

> if experience is truly a fundamental property, it seems natural for it to be widespread. . . . It would be odd for a fundamental property to be instantiated for the first time only relatively late in the history of the universe, and even then only in occasional complex systems. (p. 297)

Perhaps the most worrisome problem with panpsychism, for Chalmers, is what is often termed "the combination problem." In his own words,

> the central reason why the term [panpsychism] is misleading. . .. is that it suggests a view in which the experiences in simple systems such as atoms are fundamental, and in which complex experiences are somehow the sum of much simpler experiences. [And] while this is one way things could go. . .. complex experiences may be more autonomous than this suggests. (p. 299)

It is interesting to note that Chalmers (along with most panpsychists) is not worried about any combination problem in the *physical* realm. He never finds it troubling that complex physical objects could somehow be the sum of much simpler ones, since he actually believes that macro-entities such as tables do not really exist except as a crude sort of functional identity for those who encounter them. The combination problem supposedly arises only in the realm of consciousness, and "the *informational* view suggests a picture on which complex experiences are determined more holistically than this." Let's return, then, to the informational view.

Chalmers warns us (p. 302) that he is now venturing into "speculative metaphysics, but [this] is probably unavoidable in coming to terms with the ontology of consciousness." The metaphysics in question resembles Russell's neutral monist view that both the mental and the physical arise from a more fundamental reality. After all, "physics tells us nothing about what mass *is*, or what charge *is*: it simply tells us the range of different values that these features can take on, and it tells us their effects on other features." For the purposes of science, "specific states of mass or charge might as well be pure information states. . ." Chalmers spends two pages entertaining the possibility that information is the *only* thing that exists – a pure informational flux without anything concealed behind it. Yet he finally concludes (pp. 303–304) that this picture does justice neither to bodies nor to phenomenal experience. For there is a certain "intrinsic" character to experience, which does not immediately pass into further abstract information for some further purpose; it is simply *there*, absorbing our attention. And as for the physical realm, a model of pure information with nothing behind it might give the impression that "[such a] world is too lacking in substance to *be* a world. . .. one might find it plausible [instead] that every concrete difference in the world must be grounded: that is, that it must be a difference *in* something."

And this is where Chalmers feels close to Russell. If the informational model falls short of the intrinsic character of both phenomena *and* bodies, then perhaps some hidden intrinsic X can unify the dualism of Chalmers's model. Yet his own take on the problem tends to privilege the phenomenal side, about whose intrinsic quality he is much more convinced; his vague hunch that the physical realm might have some intrinsic character is overshadowed by his utter certainty that this is true of phenomenal experience. This leads him to suspect that everything in the world comes down to what is *phenomenally* intrinsic. As Chalmers (p. 305) sums up his proposal, "every time a feature such as mass and charge is realized, there is an intrinsic property behind it: a phenomenal or protophenomenal property, or a *microphenomenal* property for short." This gives him a double-aspect ontology, "or as a slogan: Experience is information from the inside; physics is information from the outside."

His worry about this model, yet again, is the so-called combination problem. For "our conscious experience does not seem to be any sort of sum of microphenomenal properties corresponding to the fundamental features in our brain.... Our experience seems much more holistic than that, and much more homogeneous than any simple sum would be." (p. 306). One approach to this problem, he admits, would be to expand the double-aspect ontology from the level of basic particles into the macroscopic sphere. But here Chalmers runs aground on his old prejudice: his disbelief in macroscopic *physical* entities that would be irreducible to basic particles. The problem, as he sees it, is that

> once we have fundamental physical features realized in phenomenal information spaces, then macroscopic information seems to be grounded already: the differences that make a difference here are now grounded in microscopic physical features, which are themselves grounded in microphenomenology.

In short, there is no room in Chalmers's ontology for intermediate physical objects. In physical terms there are only microparticles, while in mental terms there are both tiny and large minds, with a nagging difficulty in linking these two sizes of mind together. Chalmers is perfectly happy to view a table as nothing but a swarm of tiny particles, but finds it harder to picture our consciousness as a swarm of tiny minds.

Yet the problem of how to build macro-minds out of tiny minds is not even Chalmers's greatest concern. What he seems to fear most is the classic difficulty of mind becoming a useless epiphenomenon – a frivolous film on the surface of a causally closed universe. Earlier in the book (p. 165), he admitted briefly that "the biggest worry about [my] view is that it implies a certain irrelevance of phenomenal properties in explaining behavior, and may lead to epiphenomenalism..." And even earlier,

> if consciousness is merely naturally supervenient on the physical, then it seems to lack causal efficacy.... This implies that there is no room for a nonphysical consciousness to do any independent causal work. It seems to be a mere epiphenomenon hanging off the engine of physical causation, but making no difference in the physical world. (p. 150)

This problem will be considered below.

To summarize, the two main problems that Chalmers acknowledges with his model are the combination problem and epiphenomenalism. The major problem he fails to acknowledge is his strangely asymmetrical treatment of body and mind, which grants no macroscopic-sized entities in the physical case but is plagued with an odd tension between tiny- and large-sized minds. There is also the perplexing issue of why Chalmers is fixated on the difference between bodies and minds at all. If the entities of physics are described in purely informational terms, and if phenomenal experience is also filled with nothing but abstract information, then it seems fairly clear that Chalmers is discussing the wrong dualism. He should drop the idea that there are two basic classes called bodies and minds, and replace it with a dualism of *intrinsic realities* and *the information transmitted about them*. Objects would be zero-person intrinsic realities that simply go about being whatever they are, prior to any informational abstraction by other entities. But for objects to become *accessible* to other objects means that they must be reduced to abstractions, translated into informational holograms that do not do full justice to their reality. And this is all the dualism we need. Minds and bodies are both objects, not two fundamentally different pieces of furniture in the universe. An electron both is it what it is, and is also information making a difference to other realities, though in pitifully abstracted form. The same is true of a conscious mind: I am what I am, but all introspection comes up woefully short of exhausting what it is to be me. In a sense, eliminativists are right when they argue that first-person description is no different from the third-person kind.[12] Both are descriptions, and hence both are purely informational. My consciousness is not equivalent to my first-person "feel" of it, because my self-understanding is never adequate at any given moment.

3. Combination and epiphenomenon

The reason I have spent so much time on Chalmers is because his mistakes strike so close to the truth. Already, I have argued that his traditional distinction between bodies and minds needs to be replaced by one between objects and relations; furthermore, I have contended that he is wrong to reduce macroscopic *bodies* to lower-level structures and higher-level functions, since consciousness is not unique in being irreducible to its component parts.

Chalmers portrays himself as a former materialist who was finally forced to admit that consciousness must be irreducible to matter. Yet the most striking point is that even though Chalmers is no longer a materialist about consciousness, he remains a materialist about everything else. Now, the main problem with materialism was cited by Chalmers himself: it is a purely *relationist* model of the world. As Russell observed, scientific matter is defined only by its relational effects on other things, never in its own right. But since these effects are always measurable in mathematical terms, this makes materialism a form of *idealism*, not of realism.[13] And though Chalmers might seem

12. See, for instance, page 97 of Paul Churchland's lucid early work *Scientific Realism and the Plasticity of Mind* (1979; Cambridge University Press).

13. See Bruno Latour, "Can we get our materialism back, please?" *Isis*, 2007, 98: 138–142.

like a hardnosed realist, given his loyalty to the supposed microparticles of physics, he is an idealist about all physical things larger than that. Chalmersian physics exists only at the micro-level, while Chalmersian consciousness exists both at the micro-level of basic particles and (somehow) at the macro-level of complex living beings. For him it is largely a matter of adding conscious tiny particles to the known list of conscious humans, dogs, and mice, with nothing in between. This makes his proposal of conscious thermostats especially refreshing, since it begins to populate the intermediate zone of the world for the first time in the book. However, if every conscious state is associated with a physical state, this immediately suggests that the *physical* thermostat should also be a real entity over and above the quarks of which it is made, just as the *conscious* thermostat is something over and above its microphenomenal components. Yet Chalmers's instinctive materialism in physical questions prevents him from taking this step.

We must proceed further into speculative metaphysics than Chalmers himself. Recall his proposed final slogan: "Experience is information from the inside; physics is information from the outside." The difficulty lies in seeing how there could be any such thing as information from the *inside*. Chalmers extends Shannon's theory to say that all perceptual and physical information is an abstraction from some more complicated reality, filtering out all access to 50-hertz spiking frequencies and other causal entities. In this respect, both experience and physics are concerned with *outside* views on information. Therefore, I ask: why preserve the dualism between experience and bodies? Why not just unify them as forms of information straightaway? The reason stems from Chalmers's lingering sense that only phenomenal experience is intrinsic. Since he holds that the physical is always reducible, but the phenomenal never is, the phenomenal must count as something intrinsically real. Even physical microparticles turn out to be purely relational for Chalmers, due to Russell's point about the purely relational character of the physical. Thus, the only way for Chalmers to prevent the reduction of the world to a sheer causal flux, the only way to give it some sort of intrinsic reality, is to double up relational microparticles with intrinsically real microminds. But whatever the gains of such a model, it is certainly not neutral monism. Instead, it is a dualism of two *types* of entity, with minds playing the intrinsic role and bodies the relational role.

But if any genuine dualism arises from Chalmers's reflections, it lies between information and whatever it informs us about. Phenomenal experience can only be called 'intrinsic' on the basis of an ambiguity. To begin with, I will agree with Chalmers against eliminativism that phenomenal experience is a brute *factum*: here it is, I am having such experience. But introspection can never grasp this experience as a whole. Introspection, just like the relational descriptions of physics, gives us information viewed from without – it is a more or less noisy translation of whatever this information is *about*. Consciousness is intrinsic not because it is *experienced*, but because it *is*, and my experience of myself can only be an informational abstraction no less than physics is. Moreover, in this sense even bodies are intrinsic: no list of features of an electron can replace that electron, and this means that the electron too is an intrinsic, autonomous object. We do not need to add a micro-mind to the electron *just for the sake of making the electron intrinsic*; if there are grounds for panpsychism, they are not to be found here. This means once again that the difference between first-person and third-person is superficial, even nonexistent. Electrons exceed my information about them, and my conscious reality exceeds my own informational 'feels' about it. The key opposition is not between mind and body, but between objects and relations, as the occasionalists already knew. The difference is not between first-person and third-person, but between zero-person and any-other-person.

But it is not only we humans who encounter other entities as information; the same holds for non-human entities in their encounters with each other. In terms of Russell's remark, it is not just that *science* only gives us protons and electrons in relational terms, but that protons and electrons only encounter *each other* that way as well. It is not just human consciousness that translates reality into information; relationality in general must do this. This is the true root for any form of panpsychism. You and I encounter nothing but information, and so do protons, electrons, candles, and dogs. It does not follow from this that all of these entities are *nothing but* information, since this would eliminate any intrinsic features from the cosmos, and Chalmers is right to see problems with such attempts. Protons and electrons are intrinsically *objects*, irreducible to any causal information they might generate, and so are human beings. Shifting terminology slightly, the real dualism in question is one between objects and images. Objects are real, but withdraw permanently from any adequate relational access, just as in the occasionalist model. And given that real objects withdraw from interaction, it cannot be real objects that interact. They only interact *vicariously* in some shared medium where they are somehow able to meet. It should be clear by now that this shared vicarious medium of objects must be purely informational, since information is the only common currency that all objects share. Objects collide only indirectly, by means of the images they present as information. Yet there must be some way for this to lead to effects on real objects themselves, or else causal relations would never occur.

An obvious question is where information is located. Strangely enough, the only possible answer is that images of objects are found *on the interiors of other objects*. As bizarre as this might sound, it is already the basic principle of Brentano, the forefather of phenomenology. Brentano's discussion of the difference between the mental and the physical is well-known:

> Every mental phenomenon is characterized by what the Scholastics of the Middle Ages called the intentional (or mental) inexistence of an object.... or immanent objectivity. Every mental phenomenon includes something as object within itself, although they do not all do so in the same way. In presentation something is presented, in judgment something is affirmed or denied, in love loved, in hate hated, in desire desired and so on.
>
> This intentional in-existence is characteristic exclusively of mental phenomena. No physical phenomenon exhibits anything like it. We can, therefore, define men-

> tal phenomena by saying that they are those phenomena which contain an object intentionally within themselves. (1874/1995: 88–89)

Here I wish to retain just one key portion of Brentano's doctrine: the model of *inexistence*. Information or images, which we might also term 'intentional objects' in the manner of Husserl, are contained in another object, giving them the status of immanent objectivity. This contrasts with the withdrawn, never-immanent objectivity of real objects. Intentional objects are not autonomous, but exist only on the interiors of real ones.

But two other aspects of Brentano's theory must be rejected. First, we should refuse his implication that there is no intentionality in the physical realm. We have already suggested that information, translation, relation, or image do not just belong to mind in the narrow sense of advanced conscious beings, but characterize any relation at all. Electrons, just like humans, encounter mere informational images of atomic nuclei, and do not deal with these nuclei in naked presence any more than we do. This is the sense in which electrons have intentional experience, however primitive it may be. Second, even if intentional objects exist at the core of some other object, there is no reason to claim that this other object is *me*. In fact, my perception of the tree is not on the inside of me, but on the interior of a strange new object: my *relation* with the tree. Too often, the term 'object' is restricted to durable physical solids, and for this reason it might seem odd to describe my relation with the tree as an object. But the problem disappears if we redefine an object as anything that has intrinsic reality apart from the information that someone or something might have about it. And my relation with the tree clearly meets this standard. The relation clearly occurs, or there would be no perception; yet this relation is also not exhausted by my consciousness of it, since I can make mistakes in describing my perception, and painstaking phenomenological work is needed even to attain partial success. Just as little can some outside observer exhaust my relation to the tree, perhaps by describing it in the functional terms of experimental psychology. Hence, the relation between me and tree meets the criteria for an object. And it is this object, not me, whose interior contains my perception of the tree. It should be noted in passing that there is a strange asymmetry here. While the tree-image or tree-information is what appears in-existently in the perception, I myself am present as a *real* object rather than a merely intentional one, since I really am experiencing the image. Thus, the interior of an object contains the proximity of a real object with an intentional object. This means that if the tree manages to relate to me as well, this would generate a reciprocal but non-identical object in which the real tree brushes against the phenomenal version of me. But this is a theme for another occasion.

To change perception from something immanent in me to something generated by my *relations* with other things is reminiscent of Rockwell's best arguments in *Neither Brain Nor Ghost* (2005). His central idea in this book is the impossibility of localizing consciousness in the brain. Rockwell first contends that mind must be extended into the nervous system as a whole, but he eventually brings the entire surrounding world into the drama of consciousness:

> When we inquire into the world, we discover the system whose natural parts are the body, the brain, and the world. But we have no reason to assume that the brain can produce experience without the other two, any more than the lung can perform its proper function without oxygen. (p. 101)

And here I agree. But although it is admirable when Rockwell brings relations into the picture, he indulges in the pragmatist excess of *reducing* things to their relational contours:

> [W]e experience, not sense data that remind us of objects, but *the objects themselves* in a world with which we interact: tables and chairs in which we sit, and people with whom we have relationships, people whose likeability and cruelty or beauty is every bit as predicable to them as is their height or weight.

This passage denies the model that I advocate of information as a more-or-less faulty translation of intrinsic objects. For Rockwell, the things themselves simply *are* the information we have about them. What bothers Rockwell most is "the idea that we start from experience that exists only in our minds, and from this infer the existence of a universe of dead clockwork." But here he mixes two distinct issues. Realism about the external world in no way entails a universe of dead clockwork. Rockwell clings to the relationist view that there is no cryptic reality behind how things are accessed. But Rockwell's pragmatist views need not be opposed with a dead-clockwork version of realism: *au contraire*, the "dead clockwork" of physics means a purely *relational* system of things dealing with each other as simplified abstractions. Hence, Rockwell's pragmatist relationism ironically puts him in the same camp as the relationism of clockwork materialism. Furthermore, his insistence that a person's cruelty or beauty are just as real as their height or weight is both revealing and irrelevant. For why does Rockwell assume that height and weight are dull clockwork realities existing in a gray outer world, while cruelty or beauty must be exhausted by their manifestation to us? Beyond any *information* I have about a person's cruelty or beauty are the cruelty or beauty themselves, summoning me to explore their flickering depths. Although we should honor Rockwell's sensitivity to the fact that perception is produced by relations rather than by a simple brain-thing, there is no reason to endorse his pragmatist relationism, which already led him to miss the surprisingly *realist* lesson of Heidegger's tool-analysis: tools that hide behind any informational or relational profile.

We should make a final point concerning the various different *levels* of the world. We have seen that Chalmers largely rejects such levels. He offers a one-layered physical world of tiny things, and an apparently two-layered mental world in which tiny microminds combine at some point into full-blown macrominds. Yet we should no longer speak of a misleading dualism of minds and bodies. The real duality is between real objects and their interiors – volcanic regions riddled with intentional objects. Now, there is no reason to assume that objects are found only at Chalmers's own levels of microparticles and two sizes of minds, with everything else reducible to structure or function. Objects emerge at countless different levels. This is argued for instance by Manuel DeLanda (2006), who proposes a wonderful model of a world consisting of *assemblages*: real units made up of subpersonal components. In this way, he populates Chalmers's empty macro-sized wasteland with countless genuine entities. As DeLanda puts it, "the terms 'micro' and 'macro' should not be associated with two fixed levels of scale but used to denote the concrete parts and the resulting emergent whole *at any given spatial scale*." An emergent whole "must be shown to emerge from the interaction between *subpersonal components*." (p. 32). DeLanda even offers some criteria for what makes a real assemblage. He names at least four characteristics of new emergent realities, none of them permitted by Chalmers's less stratified vision:

1. Obviously, the emergent whole must have emergent properties not possessed by its parts. Here we should not be hasty in assuming that emergent *physical* processes can easily be reduced to lower-level physical ones.[14] If "no one could have predicted" the emergence of consciousness from the brain, it is equally true that "no one could have predicted" inert gases and rare earths just by knowing about protons, and "no one could have predicted" the basic forms of government just from knowing about human beings. There are effects of surprise and novelty at every possible level, not just at a single magical gap between microparticles and consciousness.

2. The whole can have retroactive effects on its parts.[15] This is easier to see in the case of large social objects such as fraternities and armies, but it holds at lower levels as well.

3. Emergent wholes are characterized by "redundant causation," in the sense that many of their parts can be removed or replaced with no impact at all on the whole (p. 37). For example, even if it is true that the atoms in the human body are completely replaced every seven years or so, this is not grounds for claiming that the body is no longer the same body.

4. Emergent wholes often create *new* parts. As DeLanda puts it,

> while some parts may pre-exist the whole, others may be generated by the maintenance processes of an already existing whole: while cities are composed of populations of interpersonal networks and organizations, it is simply not the case that these populations had to be there prior to the emergence of a city. In fact, most networks and organizations come into being as parts of already existing cities. (p. 39)

This is also clearer with large social entities, but holds for smaller objects as well.

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14. The contrary assumption is shared even by Galen Strawson, who agrees with Chalmers that phenomena such as liquidity and convection cells do not pose the same sort of mystery as consciousness. Strawson writes: "In both these cases we move in a small set of conceptually homogeneous shape-size-mass-charge-number-position-motion-involving physics notions with no sense of puzzlement" (2006: 13). Like Chalmers's own model, this grants materialism the right to run rampant over all of reality *except* consciousness.

15. 2006: 34. DeLanda credits Roy Bhaskar for this point.

In short, there is far more drama underway at each level of objects than Chalmers is willing to grant. To assemble a new object also means to assemble a new interior to that object, and hence a new information space. Instead of Chalmers's two-storey building of physical and phenomenal, DeLanda suggests a palace of infinite storeys. Every object is a capsule or container hiding its own interior. The world is made of autonomous ascending and descending levels of bubbles, vacuum-sealed spaces of information that nothing can penetrate, as if the world were a nested set of black holes.

This model may seem strange, but it has the immediate benefit of dissolving Chalmers's two biggest problems. First, consciousness is no longer a sterile epiphenomenon irrelevant to causation. Quite the opposite: an informational space that houses intentional objects is now the *only possible site* of causation, since real objects withdraw from each other to such a degree that they are never able to touch. Instead of an epiphenomenon, consciousness is now an *infraphenomenon* in the heart of an object, confronting images in their intentional inexistence or immanent objectivity. Second, the notorious combination problem is transformed into something more like the occasionalist problem. It is no longer a question of billions of microminds being packed together in a single mid-sized macromind. Instead, there are new assemblages of objects at each level, whose abstracting tendencies *cut them off* from most of the reality existing below. Just as cones in the retina abstract from most visual information, any macro-sized object will not have a chance of accessing most of the information possessed by its increasingly tiny sub-components. The world is filled with levels and way stations, and information does not smoothly cascade from one level to the next. The world is made of chunks, and each chunk translates information into a new language. A table is not locally composed of trillions of particles, but is made of only four or five pieces, isolated from most of what goes on deep below. Likewise, the conscious experience on the interior of an object arises from the relation between a small number of locally relevant objects, not from the trillions of tiny minds that swarm beneath the radar. Thus, we no longer have a combination problem of the sort that plagues Chalmers. But we do have a new problem, as any philosophy must. Namely, the problem is how immanent relations in the interior of an object ever puncture that immanence so as to affect *real objects*, instead of just making contact with pure images. This problem provides a lengthy research program, and cannot be discussed further here. Instead, I will close with a brief reflection on whether the model just described also amounts to panpsychism.

4. Panpsychism and endopsychism

Among other activities, David Skrbina often acts as a ruthless Minority Whip in the field of panpsychist studies. He frequently wonders aloud why certain authors walk the edge of the panpsychist pool while refusing to dive in. Instead of clear consideration of the panpsychist option, "one [usually] finds a mushy middle ground in which philosophers fail to clearly articulate their views one way or the other." (2005: 7). In the specific case of Chalmers:

> If [John] Searle has one valid point [in his response to Chalmers], it is that [he] is unwilling to follow through explicitly on the consequences of his own theory: information is postulated to have a phenomenal aspect, and information is everywhere, then so is experience. (pp. 242–243)

Concerning my own case, Skrbina writes: "I know you have been dancing around this whole [panpsychist] issue for awhile..."[16] Fair enough. Here is a good example of my previous dancing:

> [It is] invalid to draw [panpsychist] conclusions, and to conclude that because humans and rocks both enter into relations, rocks must already have human cognitive powers in germinal form.... If we shift to the case of glass.... the [panpsychist] is like someone who says that everything in the world is equally glass, though perhaps in a "weaker" form than windows. What is lacking is the most sensible alternative, which is to say that human knowledge, just like glass, backbones, reptiles, music, and mushrooms, arises at a certain point in the history of the universe, but without necessarily forming some sort of root metaphysical dualism in the world. I see no convincing reason to regard human knowledge as of such pivotal importance in the universe. (Harman 2005: 83–84)

There are two problems with this passage from my recent past. The first is that it takes panpsychism in too narrow a sense. Skrbina's book frequently observes that there is "a sort of panpsychist hierarchy of terminology, ranging from the most human-like to the most universal." (p. 18). His examples of various aspects that one might include in a panpsychist theory include: self-consciousness, cognition, thought, consciousness, sense, awareness, sentience, emotion, experience, mind, mental state, what-it-is-like, qualia, nous, psyche. The theory of universal relations between objects sketched above clearly belongs somewhere on this list, though it may remain unclear exactly where.

The second problem with the passage is its insufficient candor in admitting to the key dualism in question. If we speak of a universe where all objects withdraw equally from one another, then this is neutral monism insofar as everything is an object, and radical pluralism insofar as there are countless objects. But in another sense it is admittedly a form of frank dualism, given its basic split between hidden real objects and accessible images housed on the interior of objects. While it may be true that the *human* mind is of no more ontological importance than glass, something like mind is still present everywhere, and this is surely not true of glass. In the duality of objects and relations, there is something distinctly mind-like about the 'relations' side. On the whole, I am now more inclined to embrace the term 'panpsychism' than before, since the obligation I feel of placing all relations between entities on the same

16. Personal communication, June 27, 2007.

footing puts me closer to the panpsychist position than to either materialism or the usual human-world couplet.

If one thing seems to unify the mentality of all entities, from specks of dust, to bats, to humans, to demigods, it is what Chalmers describes as the experience of information. And if we are committed to reality having some sort of intrinsic character (as I am), then this entails some sort of sub-informational reality that can be presented only in translated form. It seems obvious that a genuine realist standpoint would need to focus on the tension between these two realms: realities vs. their informational profiles for other realities. But this would still miss something important, since it would overlook any stratification *within* the informational sphere. And here a surprising contribution is made by Edmund Husserl, whose human-centric phenomenology seems like such a poor match for panpsychist themes.

Husserl is rightly viewed as an idealist who brackets all consideration of the natural world and lets philosophy unfold only in the conscious sphere. But there is more to Husserl than this. Unlike most idealists, Husserl gives us an ideal realm that contains both intentional objects *and* the accidental ways in which they happen to appear (a.k.a., "adumbrations"). This challenges the usual model of conscious experience, which holds that experience encounters a certain content of specific qualities. In the famous *Logical Investigations* (1970), Husserl challenges the mainstream standpoint of British Empiricism, which holds that experience is always of "experienced contents" – that our supposed experience of a unified apple or horse result from a supplementary bundling of numerous discrete qualities. For Husserl, and for the entire phenomenological tradition he inaugurates, what we experience are intentional *objects* rather than free-floating pointillistic sensations held together through the force of habit. He even makes a similar criticism of his honored teacher Brentano. Whereas Brentano had held that "[intentions] are either presentations or founded upon presentations," Husserl counters that "every intention is either an *objectifying act* or has its basis in such an act." (p. 648; emphasis modified).

Now, what is the difference between a presentation and an objectifying act? A presentation consists of highly specific informational content, in which everything in our field of experience has a determinate color, position, surface glitter, and a specific distance and angle from the observer. All parts of the presentation are equally real *qua* presentation. Yet things are different if we consider experience as made up of objectifying acts. In this case, I look straight through the outer costume of things and intend objects as *essential units*. When circling a tree or a warehouse the presentation changes constantly, while the objectifying act itself does not. I intend the same *object* through all my motions, even though the *presentation* changes constantly. This all comes to a head in the famous *Logical Investigations* VI, where Husserl (p. 712) speaks of how the object "is only given 'from the front,' only 'perspectivally foreshortened and projected' etc." And

> whether I look at this book from above or below, from inside or outside, I always see *this book*. It is always one and the same thing, and that not merely in some purely physical sense [which plays no role in Husserl's philosophy- g.h.], but in

> the view of our percepts themselves. If individual properties dominate variably at each step, the thing itself, as a perceived unity, is not in essence set up by some over-reaching act, founded upon these separate percepts. (p. 789)

In other words, we no longer have just a distinction between real objects and their informational simulacra, with the latter forming the straightforward topic of experience. Instead, Husserl's philosophy gives us a permanent duel *within* the informational realm: a duel between intentional objects and the swirling surface-effects through which they are announced. In short, experience for Husserl is quantized into chunks, each of them encrusted with an ever-shifting patina of accidents.

Now, even panpsychists will surely accept that at least *some* features of human mentality are not found in whatever microminds might populate the world. High-level thinking capacity, color vision, language, emotional life, and the ability to dream are among the numerous mental gifts that we would not expect to find very far down the chain of mental beings. But what about Husserl's object-oriented model of intentionality? When considering the duality between intentional objects and their shifting surface-effects, it might be asked whether this is the sort of primitive mentality that belongs to all real beings, or whether it has all the special human complexity that we find in the ability to learn languages and make mathematical discoveries. The question is not whether all objects experience information generated by other, concealed real objects, since that point is already granted by the model developed so far. Instead, the question is whether even the most primitive sort of experience must encounter immanent objects in the intentional realm, rather than splotches of isolated qualities. My suspicion is that intentional objects are a primitive phenomenon found in all experience, and do not first arise in higher forms of consciousness. If this is so, then even the most rudimentary inanimate experience is torn by a rift between unified intentional objects and their shifting accidental profiles. And this suggests that greater mental complexity must arise from improved articulation of this very rift. Is it not the case that the apparently superior achievements of animals compared with stones are a matter of creating and distinguishing new *objects*? Physical organs ranging from ears to eyes to brains allow for greater fragmentation of experience into ever finer-grained chunks or zones. The discovery of mathematical objects adds even non-tangible realities to the field of human mentality. Complex human societies are able to preserve even dead persons in the form of historical records, and our fixed names, identification numbers, and career resumés help turn us from interchangeable others into highly articulated specific objects. What makes one mind more complex than others is probably its greater ability to discover, generate, and maintain a greater number of autonomous objects – and this is also what makes the social mind more powerful than any of our individual minds.

If this is true, if all interaction between entities involves an encounter with intentional objects, does this give us panpsychism? Almost, but not quite. The truth is subtler and stranger than this. Namely, although there is psychic experience on the inside of every object, that experience is not being had by the object itself. Hence, although every object has an interior, it is not necessarily the case that every object will enter into relations with others, and hence have experience of immanent objectivity on the inside of another. Earlier I claimed (against Brentano, and to some extent with Rockwell) that experience is not something internal to me, but internal to my *relation* with a tree, horse, apple, or whatever I perceive. If all experience occurs on the inside of an object, that object is never I myself, but a composite object formed of me and that to which I relate. Within that interior, I experience an informational image of the tree, and it may well encounter an image of me as well (though that would take place on the inside of a different object, if a closely related one). But consider the status of the larger object formed of me and the tree, or the parallel object formed of the tree and me. It need not be the case that such a larger object enters into relation with anything else. It certainly has an interior, because that is where my experience occurs right now. And to have an interior is enough to make it real, since that is all it means to be an object: to have a genuine internal reality not exhausted by any outside view. But the interior of that larger object is experienced only by one or more of its *pieces*, not by the larger object itself. No object experiences *its own* interior, just as I myself do not – I experience the interior of my relations with the things I perceive, not the interior of myself. It is nearly certain that there are many objects that have a genuine reality, but which still enter into no further relations. Such objects would be genuine inhabitants of the world, despite not entering into relation with anything else. Hence they would be real, but without experience. Instead of a full-blown *pan*-psychism, then, we would have to content ourselves with an *poly*-psychism, in which entities might be real while encountering nothing at all. Many real objects might be doomed to perpetual sleep.

In closing, let's review what this article has tried to show. First, the traditional mind–body problem was replaced by the occasionalist model of a body–body problem. Second, the supposed difference between first- and third-person descriptions was shown to be a false duality, since both kinds of description belong on the same side of the fence when compared with the zero-person intrinsic nature of things. And finally, it was suggested that while there is experience or immanent objectivity on the inside of every object, what does the experiencing is not the whole object itself (my relation with a tree), but only one of its components (in this case, I myself). This opposes Brentano's claim that perception occurs on the inside of the perceiver, and veers toward Rockwell's view that consciousness is a relational sort of reality. It follows that even if all entities *contain* experience, not all entities *have* experience. Hence panpsychism is not strictly true, even if there are exponentially many more minds than is usually believed.

CHAPTER 14

"All things think"

Panpsychism and the metaphysics of nature

Iain Hamilton Grant

Panpsychism has both a negative and a positive value to contemporary metaphysics. Negatively, it provides a critique of the problem of epistemological and/or phenomenological access as a precondition of metaphysical validity. This critique is pertinent because the precondition is as ubiquitous as it is unacknowledged in both post-Kantian and post-Humean metaphysics, an assumption that we will call the *principle of finitude*. Positively, by setting panpsychism against emergence, it opens a problem at the heart of contemporary metaphysics of nature, namely, the composition of nature from powers. Briefly stated, this essay will argue that if nature is so composed, then reason must be amongst its powers. In so doing, we will note how this composition recasts the panpsychism-emergence problem and removes from the principle of finitude its authority over reason.

By addressing panpsychism from the perspective of both post-Kantian and post-Humean metaphysics, I wish to indicate that these two 'schools' share more than they dispute.[1] This becomes especially apparent in the context of the contemporary metaphysics of nature. On the post-Humean side, metaphysicians of nature argue about the 'groundedness' of powers – are they ontologically basic, or properties of a more basic substance? Some argue for the 'ungrounded thesis' (Mumford 2006), and some hesitate between powers and substances (Molnar 2003). On the post-Kantian side, metaphysicians argue about the groundedness of reason – what candidates may satisfy the principle of sufficient reason? Some argue that this is best explored through the metaphysics of nature (Grant 2006), and some through 'pure reason' (Meillassoux 2008a). What vitiates all such projects, however, is an attachment to the metaphysics entailed by what I will call the principle of finitude, which we shall address below.

Before discussing the principle of finitude, I wish to demonstrate why it is that the problem-field of panpsychism requires address not from the philosophy of mind, which presupposes the access problem, but rather from the perspectives of ontology,

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1. That is, by what used to be called the 'Anglo-American' and 'continental' schools of philosophy.

on the one hand, and the philosophy of nature on the other. To do this, I shall derive some salient features of this expanded address to the problem of panpsychism by contrasting them with ontological claims from which they may be considered to derive.

1. In what does the identity of being and thinking consist?

First amongst these resources is Parmenides' *identity thesis* concerning being and thinking, which establishes the ontological scope of the problem. Fragment 3 reads, "for thinking and being are the same (*to gar auto noein estin te kai einai*)." Taken at face value, the panpsychist implication is immediately evident: whatever is, we might say, thinks. Yet even reformulating it to this slight extent presents us with problems. The inference from 'being is identical to thinking' to '*whatever* is, thinks' has added a qualification to being, now considered as composed of singular beings that are and that think, rather than being as such. To further clarify the point, consider Cornford's account of Parmenides' identity thesis: "It is the same thing that can be thought and can be," which he sets against what he takes to be the patently absurd thesis that "to think is the same thing as to be" (1964: 34). Behind both these versions lies the assumption of a thinking *subject*, one that either possesses the *capability* of thinking what is (where 'what is' is an object the 'being' of which satisfies the necessary conditions of thinkability), or that *is by virtue of thinking*. This becomes especially clear in Cornford's translation of fragment 8: "Thinking and the thought that *it is* are one and the same" (1964: 43), which restricts concern to the *thought* of 'what is'. *But does thinking entail a thinking subject*? No such assumption is evident in either fragment: while fragment 8 asserts the identity of thought (*noein*) and its object (*noema*), fragment 3 asserts the sameness of thinking and being in their infinitive forms. Although therefore neither fragment suggests anything about what thinks *amongst* what is, fragment 3 gives being itself as the only possible agent of thought. Cornford's subjectivist assumptions, most apparent in fragment 8, disguise the panpsychist implication of fragment 3 and transform it into a contest between a sanely epistemic account (only what is can be thought) and an 'hysterical' Berkeleyan subjective idealist account (to be it is sufficient to be thought).

By contrast, consider what Plato's *Parmenides* puts in its titular philosopher's mouth: "all things think" (132c). Although the dialogue does not present this as a statement of Parmenides' own theory, but results from his criticism of Socrates' presentation of the theory of forms, it effectively restates the panpsychist content of fragment 3, but with a difference. While fragment 3 states that *being is thinking*, Plato's Parmenidean ventriloquism has it that every *thing* that *is*, *thinks*. While Cornford's accounts assume something about thinking (that thought presupposes a thinking subject), Plato's assumes something about being (that it is composed of *things*). We can express this contrast as between the *subjectivist* and the *substantivist* accounts.

Despite their contrast, the assumption that if there is to be thinking, *there must be a thing that thinks* unites these accounts. From this assumption, there follows (a) the task of determining the *nature* of the "thinking thing," with its well-known Cartesian results; and (b) whatever its nature, its 'thinghood' determines it as bounded or finite. Yet if we compare them with the fragment of which they are versions, we note that Parmenides makes no such assumption: we cannot, in fact, infer a thinking *thing* at all. Rather than offering stipulations or hypotheses concerning the nature of what it is that thinks, fragment 3 simply asserts the identity of the activities of thinking and being, and specifies no subject or substance that either 'can' be or think, or in which such activities may inhere. Indeed, the substantivist assumption that Plato's dialogue makes is at odds with the essentially dynamic ontology advanced in the *Sophist* (247e): "I hold that the definition of being is simply power." Precisely this debate between Platonic dynamics and an Aristotelian substantivism lies at the core of an important strand in the contemporary metaphysics of nature. Recent discussions of powers have polarized into grounded and ungrounded accounts, where the former hold that powers inhere in substances, and the latter that they do not. For the latter, if nature consists solely in powers, then since powers are not powers unless they *can* do something, that something that powers can do expresses a "physical intentionality." With this conclusion, however, there arises what one such theorist presents as "the threat of panpsychism":

> To extend the domain of intentionality from the admittedly mental sphere to what are normally taken as purely physical states and properties, is to prove that Thales may have been literally correct in attributing a soul to the magnet.
>
> (Molnar 2003: 70)

What Molnar considers a "threat" is simply an argument: if there are no substances to ground powers, then intentionality cannot be the property of a substance, but rather the expression of a power. Hence intentionality is no longer the exclusive hallmark of the mental, since it cannot a priori be said to inhere in any subject or substance whatever. Regardless of the location of intentionality in all or some powers, we will maintain this ungrounded dynamic understanding of nature in what follows.

For the moment, however, we have arrived at a core contrast between Parmenides' identity thesis and the versions of it we have considered. The contrast is *ontological* in nature, and requires the rethinking of both subjectivist assumptions on the part of *thinking*, and substantivist assumptions on the part of *being*. Since we cannot infer subjects or substances from the fragment, we are led to consider the kind of ontology it actually proposes. And since in their infinitive forms, being and thinking are *powers*, we may conclude that this is an ontology of powers, ungrounded in any substance in which they might inhere or of which they might be properties.

Regardless, however, of whether the ontologies in question take substances/subjects or powers as basic, Parmenides' fragment leaves us with the further problem of determining whether 'being = thinking' amounts to one or many. Whether powers or subject-substances, both dynamic and substantivist accounts assert a plurality of powers or substances. It is this problem that the subjectivist-substantivist seeks to resolve by *individuating* the various existents and thinkers from the two otherwise undifferentiated infinitives. Yet subjects-substances are not the only ontological tools available for this individuation. Reformulated in terms of powers, for example, the problem remains: why, if being is identical to thinking, are there two powers between which an identity needs to be forged (and what, apart from either being or thinking, does Parmenides' ontology make available to forge this bond)? Surely if the proposition that being and thinking are the same is true, there are not many powers, but only one? Either, that is, we are left with a monistic being-thinking which distinction must ultimately be untenable, or with a dual-aspect monism of the Spinozist type.

This problem is therefore particularly pertinent as regards panpsychism, since if being and thinking are the same, although the panpsychist claim is asserted, the identity thesis does not so much resolve as restate the source of the problem. If a panpsychist claim on this basis is to offer more, it must *either* assert Plato's version of the claim, assume the existence of *particulars* that think, and accept the task of determining their nature and extent ("all" or only some things?). Core to this version is the "somatism" or substantivism the Eleatic Stranger uses the theory of powers to criticize in the *Sophist*. *Or* it may assert the identity thesis but with the qualification that the identity expressed is *itself* dynamic rather than substantivist, concerning powers rather than things, and thus expressing the necessity that being *as such entails* thinking. The cost of this latter account will be, as we shall see, that the asymmetry between the two terms in the proposition is maintained – *first* being, *then* thinking – so that being is not *at all times* 'the same as' thinking, but always entails that thinking ensues.

The conclusion that being and thinking are not *always* the same follows, indeed, from both alternatives. Assuming that singulars think, the 'pan' or *all* in panpsychism becomes unachievable in that it will *not* be the case that "being and thinking are the same" unless "being" is reduced to "beings" and the "all" in panpsychism covers only that collection of particulars, rather than being as such. On this account, the Platonic "all things think" trumps the Parmenidean identity thesis, while demonstrating the restricted ontological remit of the panpsychist claim. The restriction is informative on two counts. Firstly, it is because of it that the problem of the *nature* of thinking particulars has become the focus of much panpsychist theorizing. Secondly, the ontological perspective contextualizes and thus reorients the "either-panpsychism-or-emergence" problem, and offers the conceptual space for a solution that can affirm panpsychism all the way down without eliminating the genetic or natural-historical dimension emergence brings to the table. It is this latter that the dynamic understanding of the identity thesis brings into focus, since it posits a temporal or genetic difference between being and thinking. In what follows, we will work through both solutions, the finitist and the dynamist. The prevalence of the former is due to what we might call the *internalist lure* of philosophies of subjectivity and reflection. At its limit, this promotes a *universal phenomenology* or *subjective idealism* that seeks to extend the structures of subjectivity to all that is thinkable, and to deny the existence of all that is not. The latter, by contrast, enjoys the advantage over the former of providing a consistent ontology, not least because it unites metaphysics with '*physis*' or nature without denying a realism concerning ideas, and thus avoids the dualism we take it as the aim of panpsychism to eliminate.[2]

If it is asked "why must panpsychism involve an address to nature?", as if this prejudged any solution of the problem, the answer must be: if they are *not* nature, then being and thinking – whatever their own relations – must be considered *other than* nature, and a second level dualism ensues. If however the problem is considered from the perspective of the question '*does nature think?*', then its complexion changes. For if nature does not think, dualism follows; if it does, then nature is capable of more than the production of anoetic and inert substances with which it is usually and, in some quarters, grudgingly accredited.

For now, however, we turn to the principle of finitude. The form in which finitude emerges as a problem for panpsychism is twofold: thinking substances (regardless of whether these be minds or bodies) and reflective consciousness. The first binds reason to particular (and therefore not to all) things, while the second imposes phenomenological or reflective access conditions on the identifiability of thought as such, conditions to which only an *actual* ('now occurring') reflective consciousness has access. In both cases, a principle of finitude is used to derive *ontological* consequences from the claim of insuperable *epistemological* limits, consequences that restrict the plausibility of panpsychism *a priori*. To the complete contrary, we propose in what follows to situate the finitude of consciousness in a naturalistic ontology of powers rather than substances that therefore supports both panpsychist claims and the temporal anteriority of being to thinking that motivates emergentism.

2. The principle of finitude

> How can what forms the mere limitation of a science be made into the measure of the groundedness of science in general? (Schelling 1856, V: 137)

Schelling here poses the question we will pursue in this section. He poses it as a critical question, affirming that this approach, while useful in the "subordinate sciences," has no place in philosophy, where "these limits do not exist." Here, however, we will pursue it as a *programmatic* rather than a critical question; we are looking, in other words, for how this has been successfully achieved – how, that is, the Principle of Finitude has been unquestioningly accepted by both post-Humean and post-Kantian philosophy.

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2. Although as part of his 'broad church' claim that panpsychism is less a theory than a "meta-theory" of mindedness, Skrbina (2005: 2) asserts that a "panpsychist-dualism" is not inherently contradictory on the grounds that a "Supreme Being" may have "granted a mind to all things," I will claim on the contrary that it is in fact contradictory, since it would simply reconstitute dualism between original (Supreme Being) and derivative (all things) mindedness without resolving the issue of the nature of thinking things. I am grateful to David Skrbina for his insightful comments on an earlier draft of this paper.

The authors of the principle of finitude are Hume and Kant. Bluntly stated, this principle states that possible experience provides grounds for the restriction of reason. Neither Hume nor Kant deny that exceeding experience is a possibility for reason, which first appears to Hume "unbounded by nature and reality,"[3] but assert only that in exceeding what can be accessed through possible experience, where experience is defined in terms provided, in turn, by codifying its nature insofar as we have access to it, reason loses all sure footing. The 'possible' in 'possible experience,' therefore, does not so much promise rational access to *possibilia* as restrict reason to contingency, a consequence we argue here follows from all 'access' arguments.

The key problem that the principle of finitude must address consists in deriving necessary limits from contingent experience. Hume famously denies this is possible at all, insisting instead on the "experimental method" of slow and patient trials of experience. Since Kant, by contrast, seeks to bind the contingency of experience into a framework of necessary laws, I will begin with him.

a. Kant and the 'I think'

Kant's transcendental strategy consists in nothing more than the derivation of necessity from contingency. The fruit of this procedure is to divide the contingent content of actual experience from the necessity of the formal laws of their constitution. The linchpin of these laws is the "transcendental unity of apperception." "It must be possible for the 'I think' to accompany all my representations [*Vorstellungen* 4]," Kant writes,[4]

> for otherwise something would be represented in me which could not be thought at all, and that is equivalent to saying that the representation would be impossible, or at least would be nothing to me. That representation which can be given prior to all thought is entitled intuition. All the manifold of intuition has, therefore, a necessary relation to the 'I think' in the same subject in which this manifold is found. (1781–7, B131–132)

Kant here transforms *my* contingent lack of access to a representation into the *impossibility* of representation without access. It "would be nothing to me" therefore becomes "it is impossible" because "I" is necessary. From this, of course, Kant proceeds to his 'Deduction of the pure concepts of the understanding,' which apply *necessarily* to all my acts of sensible intuition. Yet Kant's move is circular, for it asserts the necessity of the 'I think' on the grounds of the impossibility of its non-occurrence, which is to say the same thing: 'it is necessary that *x*' = 'it is not possible that not-*x*.' To avoid the accusation that this circularity is vicious, Kant adds a distinction between representation that *necessarily* has no 'I think,' and a representation that *contingently* may not have

3. "Nothing, on first view, may seem more unbounded than the thought of man, which not only escapes all human power and authority, but is not even restrained within the limits of nature and reality" (*Enquiry* ii, 13).

4. Kant intends the term *Vorstellung*, translated as "representation," to be construed as a "placing-before" since this already includes that before which an empirical event is presented.

one but *will* give rise to one. Attention is thereby shifted from a principle of finite access to a *genetic* account of the I. Kant calls this 'transcendental unity of apperception' a synthetic *a priori* truth, although being *synthetic*, i.e., *produced*, the product is made to precede its own production. Disregarding this for the moment, the principle may thus be reformulated: *all representation necessarily gives rise to an 'I think.'*

Yet this may be taken in two ways, corresponding to its construal in the *Critique of Pure Reason* and the *Critique of Practical Reason*, respectively. Firstly, it invites us to check our representations for any absent *cogito*; when no such divergence is found (since by it being *my* thought-experiment, it cannot be), we accept this as necessary for *our* experience. Thus by virtue of this phenomenological quirk, the 'I think' is smuggled into a synthetic truth that profoundly alters the concept of necessity. Hence a 'constant conjunction' of thought with 'I am thinking' becomes associated with a logical necessity attaching to possible experience. Only then are the pure concepts of understanding deduced as the products and producers of a genetic account of I-hood.

Secondly, however, Kant gives no warrant to the extension of this phenomenological evidence to a necessary truth about *us*; his concern is famously with "finite rational beings," that need not be us at all, but will necessarily share with us those "pure concepts of the understanding" anchored by the necessarily accompanying 'I think.' Thus the prospect of a warranted *projection* opens up that enables the increased speculative range that Kant grants practical over theoretical reason. This projection seemingly also lends support to the panpsychist cause, insofar as it does not in principle restrict cognition to one species of creature, but generalizes it to any and all entities capable of generating an 'I think.' If we take Kant at his word, and consider the 'I think' a logical necessity, then no entity whatever may be definitively ruled out as a candidate vehicle for I-hood. It was left to Kant's successor, Fichte, to generalize from this principle in his 'Propositions for the Elucidation of the Essence of Animals' (1800), where he notably failed to extend this cognitive generosity to minerals.[5]

Although the second may seem, at first glance, to lend possible support to panpsychist claims, a feature uniting both of Kant's accounts must be stressed: it is the thinking I to which possible experience is restricted that warrants projection. Hence the subjectivist trap into which projectivist panpsychisms fall: the barriers of possible experience can be set wherever one chooses, on condition that the 'I think' be taken as a necessary element for any entity to which 'mindedness' is thus extended. Hence Sprigge's recent (2006: 484, 478) claims on behalf of panpsychism:

> It seems to me that it is only a panpsychist view of the world which can cope with the two facts (1) that only experience exists and (2) that the physical world exists. [But t]ry to imagine something which is unexperienced. Since physical things are the most obvious candidates for things which can exist unexperienced, choose some physical scene which is supposed not to be revealed to any mind. [...] It

5. Fichte's essay is found in *Fichtes Werke*, ed. Immanuel Hermann Fichte (1971, vol. XI: 362–367). For a discussion of it, see Chapter 3 of my *Philosophies of Nature after Schelling* (2006).

> seems to me evident that one cannot do so. [Thus] the physical world certainly exists, but that it consists in innumerable interacting streams of experience.

Sprigge's claims have the great virtue of making Kant's procedure explicit: he enjoins us to "imagine some physical scene... not revealed to any mind." Since I cannot, the world consists of streams of experience, of which imagining is one kind.

If this aspect of Sprigge's claims highlights a procedural affinity with Kant, and while both conclude that unexperienced reason is *a priori* impossible, their accounts differ in one crucial respect. While Sprigge sets the limits of possible experience as co-extensive with the world as such, Kant's critical principles ensure that the only possible 'non-I'd' rational activity is as a moment in the process of the I's emergence. While leaving the extent of possible consciousnesses undetermined, therefore, Kant limits consciousness to actually occurring consciousness insofar as this is the product of a genetic process. This limited/unlimited relation will be important in what follows, since despite himself, Kant's derivation of necessity from contingency establishes the finitude of consciousness with respect to an undetermined whole. In so doing, the Principle of Finitude initiates a possible ground of discrimination between reason and consciousness.

b. Hume and the Bounded Principle

Hume provides – and criticizes – one of the major arguments for which panpsychism is routinely attacked by its detractors. Sometimes called the argument from analogy, we shall call it the *mereological* or *extension* argument, since it concerns the legitimacy of extending what may be true of the part to the whole. While in the *Dialogues* this preoccupies Philo as he discusses the determinability of the origin of the universe, our present focus concerns the determinability of thought: "What peculiar privilege has this little agitation of the brain which we call thought, that we must thus make it the model of the whole universe?" (Hume 1779/1993: 50).

For Hume, the point may be crucial insofar as it seems to crown the naturalism of the *Treatise* with a proto-neurological account of thought itself. In Philo's brief statement there occurs a shattering in the manifest image of thought that dismisses another anti-panpsychist argument: the argument from *access*. For here Hume's naturalism achieves a richness in consequence that belies the brevity of its exposition. Consider the following passage in which Philo is building his case against Cleanthes' design argument:

> Thought, design, intelligence, such as we discover in men and other animals, is *no more than one of the springs and principles in the universe*, as well as heat or cold, attraction or repulsion, and a hundred others, which fall under daily observation. (ibid.: 49; my emphasis)

It is so quick as almost to escape notice: Hume considers thought as "one of the springs and principles in the universe"; in other words, as a natural power that, as with all the other powers in nature, must remain as epistemically indeterminable as they are ontologically undeniable.[6]

Its naturalism notwithstanding, Hume's project has evident parallels with the transcendental strategy Kant proposed: to discover the laws of thought, thinking must take thought as its object. Indeed, in the immediate wake of Kant's critical revolution, its most vociferous avatars were naturalists: Christoph Girtanner in natural history, and Johann Christian Reil in psycho-physiology.[7] The latter in particular considered it essential to completing Kant's program that the *many* powers of mind be reduced to a single one, the same as operates throughout nature.

While Kant's successors share Hume's naturalism concerning thought as one of nature's "springs and principles," it is in practice less its *nature* but the *sources of its content* that forms the basis for Hume's application, in the *Treatise*, of the Baconian "experimental" method in natural philosophy to its moral counterpart. Rather than constituting a problem of insufficient sampling as it would in other experimental contexts, this procedure is *unavoidable* insofar as the "exact analysis" of the "powers and capacity…of the human understanding" (*Enquiries* I, 7) leaves *us* no other possible basis than reflection upon its operations; and we have no other point of reflective access or observation but our own thinking. Thus the nature of thought, insofar as this is determinable at all, is to be determined in accordance with the character of *our thinking*.

However much, then, Philo may protest against Cleanthes taking "the *operations* of one part of nature upon another for the foundation of our judgment concerning the *origin* of the whole" (Hume 1779/1993: 49), the principles of the experimental philosophy entail that Hume must persist in so doing. Indeed, he confirms that analogy is the foundation of "all our reasonings concerning matter of fact" (*Enquiries* I, 9) while acknowledging it a "weak [and] bounded principle" (1779/1993: 50). In effect, Hume's Bounded Principle asserts rather than denies the mereological argument – extending the operations of one part of nature on another to the whole – as made necessary by the *contingent fact* of limited access.

Taken together, the Bounded Principle and the Finitude of Consciousness form the Principle of Finitude, which therefore asserts:

1. that conscious is finite with respect to reason, and
2. that this finitude is necessary

6. It is this claim that lies at the core of a renewed interest in Hume as metaphysician. See R. Read and K. Richman, eds., *The New Hume Debate*, 2nd edition, revised (2007).

7. Christoph Girtanner was the author of *On the Kantian Principle for Natural History* (1796), and Johann Christian Reil's power-monism is expressed in his *On the Vital Force* (1796). For more, see my 'Physics of analogy,' in R. Jones and A. Rehberg, eds, *The Matter of Critique: Readings in Kant's Philosophy*. (2007: 37–60).

Unlike Kant, Hume's Bounded Principle does not seek to derive necessity from contingency, but asserts contingency as necessary. Whichever way round, however, this equation is the chief achievement of the Principle of Finitude. At issue between them, for present purposes, is whether the finitude of consciousness vitiates an account of panpsychism. Before we turn to this, we will examine a more recent contributor to debates surrounding the Principle of Finitude.

c. After Finitude?[8]

In a recent work, Quentin Meillassoux (2008a) has asserted precisely the necessity of contingency in support of a renewed "speculative" approach to the problems of ontology. Like Hume and Kant, Meillassoux considers metaphysics a catalogue of *rationally* insoluble problems. Unlike either Hume or Kant, he wishes to end the imposition of finitude projected from "thought's discovery of its own intrinsic limits" onto reason itself, a projection whose dominance he considers the principal achievement of modern philosophy. "Whereas the Parmenidean postulate, 'being and thinking are the same', remained the prescription for all philosophy up to and including Kant," Meillassoux writes (2008a: 44), "the fundamental postulate" of more recent, 'post-metaphysical' philosophy has been: "*being and thinking must be thought as capable of being wholly other.*" In other words, metaphysics is no longer credible precisely because there is no necessary relation between thinking and being. This being so, it can and should be abandoned, he recommends, by any philosophy interested in reason and reality, that is, a *speculative* philosophy that begins not from the problem, but from the *fact* of existence.

Speculative philosophy must therefore abandon the search for a sufficient reason "why what is, is the way it is" (2008a: 82) since no such reason is to be found. This being so, the "principle of sufficient reason," which states that there must be a reason for the existence and nature of everything that is, can only be an object of belief, making metaphysics into "fideism." The unavailability of such a reason entails not only that no reason can be supplied for the way things are, but also that the way things are is a contingent matter: they may be otherwise, or change tomorrow, or haphazardly, without warning. It follows that "contingency alone is necessary" (2008a: 65). That is, it is necessary that there is no necessity attaching to the laws of nature remaining the same. While there may be causes that in fact form the laws of nature, Meillassoux agrees with Hume that the nature of the problem is the "*rational justification* of our belief in natural necessity" (2008b: 272; my emphasis), although as has been recently remarked (Strawson 1992), Hume's metaphysics contains a commitment to the *indemonstrable existence* of causal powers, so that where "reason is incapable. . ., nature herself suffices" (*Treatise* I.iv.7); Meillassoux's, as we shall see, does not. Finally, rather than resting within the *insuperability of the possible difference* between being and thinking, Meillassoux advocates, in an extended analysis of 'Hume's problem,' that we

8. I am grateful to Jeremy Dunham for his stimulus in this direction. See his 'Quentin Meillassoux and the End of Metaphysics' (forthcoming).

> transform our perspective on [the resulting] unreason, stop considering it as the form of our deficient grasp of the world and turn it into the veridical content of this world as such – we must project unreason into things themselves. (2008a: 82)

If Meillassoux's abandonment of sufficient reason is as absolute as he here claims, however, why is it *additionally* necessary to "project unreason into things themselves?" For surely if no necessity governs "why things are what they are," then "unreason" or, less dramatically, the non-existence of a sufficient reason lies not merely in the "deficiencies of our thinking" that Hume analyzed, then where else can it lie but in the things themselves? Yet if unreason did indeed lie in the things themselves, then wouldn't this unreason itself be 'sufficient' in precisely the manner that the principle of sufficient reason stipulates? Meillassoux's dilemma, in other words, is the following: *either* unreason lies in things, in which case unreason is sufficient in the metaphysical sense; *or* it does not, in which case it lies within the deficiencies of our thinking. If the former, speculative reason is a species of metaphysics rather than an alternative to it; if the latter, it has not escaped the Principle of Finitude.

The point is important because Meillassoux has returned our attention to the relation between thinking and being as lying at the core of our problem. He goes so far as to define post-Kantian (and, by extension, post-Humean) philosophy in general as premised on the possibility that thinking and being are entirely unrelated. However, in the end, the projection argument belies the principle of finitude operative in his solution to the problem of sufficient reason: reason is, in Hume's words, *not amongst the springs and principles of nature*.

While this may seem at odds with *After Finitude*'s opening Cartesian reconstruction of Locke's distinction of primary and secondary qualities, it in fact illustrates an important consequence of this mathematical defense. Seeking a new, non-Kantian way to repair the gulf between rationalism and empiricism, Meillassoux presents what "can be formulated in mathematical terms" as "properties of the object in itself" (2008a: 3), and defends these against *two* alternatives. Firstly, any ontological attachment to subject-dependent sensible properties (*qualia*); but secondly against *things* independent of either mathematical formalization or perception. This is clear if we compare Meillassoux's distinction between mathematizable and sensible properties with its Lockean source. Locke calls primary qualities those "resemblances" of the qualities of bodies "produced in us" by non-resembling secondary qualities, and adds "There is nothing like our ideas existing in the bodies themselves" (*Essay* II.viii, 16).[9] Thus the purpose of the distinction for both Locke and Meillassoux, is to divide reason from nature. The difference is, in the process of isolating ideation from nature, Locke acknowledges the relation between non-resembling bodies and ideas as a genetic one; Meillassoux, by contrast, makes the division absolute and unbridgeable.

9. Hume agrees, concluding what Molnar (2003: 114–115) describes as his "projectivist" account of causality, thus: "Upon the whole, necessity is something that exists in the mind, not in objects" (*Treatise* I.iii.14).

In this sense, all philosophies beginning from the finitude of reason turn into questions concerning cognitive, experiential or imaginative access to a nature necessarily external to it. It is therefore assumed from the outset that thinking has no necessary relation to nature. Yet this is false unless we consider thought to arise outside nature. If we do not accept this, but affirm thinking as consisting of events in a physical world, some version of panpsychism becomes inevitable. It is to this we now turn.

3. Panpsychism, finitude and externalism

In the foregoing section, we have seen that transcendental philosophies (the Kantian tradition) and experimental philosophies (the Humean tradition) that take consciousness or exclusively human reason as their starting point, have as a consequence of their principled finitude an entailment of externality for which they cannot account. The principle of finitude, as we have constructed it, is an excellent example of what Molnar calls "inversion hysteria." Citing as examples of this condition Mill's inversion of "it is possible to perceive real objects" into "objects are a permanent possibility of sensation" and Quine's insistence that the "conceptual centrality of logic and maths to science is all there is to necessity," Molnar describes this process in the following terms:

> Some piece of objective reality has characteristic effects on and in humans. You then turn around and define this piece of reality in terms of its effects on humans, thereby making it mind-dependent. Inversion hysteria is a kind of subjectivizing of reality, a kind of subjective idealism. (2003: 223)

Accordingly, what we contest here is not the finitude of consciousness, but rather that it can be derived from consciousness itself. If it cannot, then its conclusions cannot be asserted *necessary for reason*.

This is why, in the first section, we followed the Parmenidean problem concerning thinking and being as such, rather than under the constraint of the Principle of Finitude. Of the two metaphysical trajectories that follow from the identity thesis, the substantivist one leads towards either a panpsychism premised on a plurality of thinking things, or to a finitism premised on the one thinking thing to which we have access. The other, dynamist trajectory leads either to a compatibilism regarding the two powers under discussion (the power to exist and to think), or to a naturalism that has thinking as a genetic entailment of being. In this section, we will attempt a portrait of this latter, and provide a reason for it other than the now obvious limitations of finitism.

We begin with a quotation from the British Idealist philosopher, Bernard Bosanquet.

> Pan-psychism seems to me a gratuitous hypothesis, depending on a hasty resolution of the responsiveness of nature to mind by help of the idea of resemblance, and wholly failing to recognize the complementary functions of subjective mind

> on the one hand and externality on the other as together essential to any complete form of conscious experience. (1912a: 364–365)

There are two reasons we might offer as to why Bosanquet considers panpsychism "a gratuitous hypothesis." The first of these is that his attention is focused here on the requirements of an account of the "complete form of conscious experience" which, he claims, must involve "externality," which we will address below. The second is that panpsychism seems, in precisely the manner we noted concerning Parmenides' identity thesis, merely to affirm a changeless identity of the "subjective mind" and "external" sides of experience, while explaining neither. The question is, why does this identity not satisfy the "complementarity" criterion Bosanquet invokes?

The answer becomes apparent when we consider Bosanquet's concept of *externality*, by which he refers to *nature* qualified by temporality. Externality thus designates "the first nature of all" (1912b: 84), that which "comes first" (1912a: 219). Externality is "the instrument for sculpturing minds" (1912b: 16), and is "the source and storehouse of all primitive properties, contents, and distinctions of mind" (1912a: 359).

Two questions arise regarding the thesis of externality. The first is how it differs, if at all, from the standard emergentist rebuttal to panpsychism? The second is more complex, as it involves an address to the problem of natural causality, and therefore concerns the rational warrant for the *sequential* dimension of externality.

Taking the questions in order, emergentism standardly claims that mind is not present all the way down, but emerges as a consequence of sufficient complexity being attained in the physical architecture necessary to support mindedness. The problem here concerns the causal triggers responsible (a) for complexification and (b) for mindedness at all, since it is not present beneath a given complexity threshold. Emergentism explains mindedness, therefore, only if it can explain these causal triggers. Recent emergentisms have addressed this problem through the concept of 'autopoiesis' or 'self-organisation.'

Conceptually, however, this concept assumes what is to be explained, since the 'self' of 'self-organisation' does not precede but *consists in* its emergence from the accretion of processual richness. The emergentist's point in fact concerns the unpredictability of the emergence of these self-organizing processes, which is why many affirm the reintegration of physics and history, or the renewed primacy of 'becoming' over 'being' (Prigogine & Stengers 1984). Since the consequence of this argumentation is that the explanation of sufficient complexification is sacrificed, effectively, to an after-the-event account – a history – of particular emergences, the emergentist cannot explain the causal triggers involved in emergence, but affirms instead the unpredictability of natural history.[10] Since to assert 'unpredictability,' however, does not

10. Matters are more complicated, however. Consider, for instance, Isabelle Stengers' (1997: 22–23) account of the distinction between the "phenomenological" and "fundamental" versions of nonlinear processes: "When I learned physics, I accepted as 'only phenomenological' the laws that describe 'irreversible' evolutions – that is, evolutions that take place in one direcprovide criteria for complexification, but reaffirms only the want of an explanation, the emergentist has no rational warrant for maintaining that there is a threshold beneath which mind cannot arise.

So if the genetic dimension of the externality claim is a problem for the panpsychist, it remains one for the emergentist, who enjoys no particular explanatory advantage over her rival. It is to this problem we now turn. The externality claim, as we have seen, does not simply involve an objectivity complementing a subjectivity, but rather the priority of nature. Priority and posteriority establish asymmetrical relations between events which invokes a causal, or genetic processes. Bosanquet's further claim that nature is the "storehouse" not only of the production of mind, but also of its "contents and distinctions," makes the externalist claim more complex in that it holds out the prospect of a causal map of each act of intellection, from geological to neurological events.

The genetic account is only one part of the externalist thesis; the complementarity criterion asserts that posteriors (whatever their nature) necessarily have this externality, and that it is insuperable (Bosanquet considers the panpsychist hypothesis "hasty" precisely because it is insensible to priority and posteriority), since if they did not, there would be no prior-externality. Consider, for example, the relation between neurological processes and actual ideation. The non-resemblance identity we established *via* Parmenides holds good here, and since only an 'hysterical' finitist would hold to the ontological separability of the ideational qualia from the neurochemical activities that produce them, it clearly illuminates both dimensions of the externalist claim: logical and genetic priority coupled with an externality between the priors and posteriors thus related. Further, since Bosanquet claims nature to be the *source and storehouse* of mind, we can see that the externality thesis does not entail any ontological separability of mind from nature, and that it posits only priority as its threshold criterion for "mindedness." In other words, it affirms the identity thesis dynamically understood, as we outlined earlier in this chapter, and explicitly denies that resemblance plays any role in identity relations. Having examined the finitist position, we are now in a position to see why this is the case: resemblance relations are necessarily phenomenal, and entail therefore a second-order posterior, or a third element, to formulate them: a consciousness.

Prior to consciousness, the identity relation already involves nature (necessarily) *and* "the contents and distinctions" of mind. In other words, *nature* is prior and external to *reason*, which is in turn prior and external to consciousness. Externality is satisfied in every relation, so that reason can be said to be less 'sparse' than consciousness. Hence the advantage of externalism over finitism: the latter requires to

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tion (a mixture does not 'unmix' itself. . .). From a fundamental point of view, the differences between the evolutions that we observe and those that we think impossible is not valid. . .. The fundamental laws of physics do not recognize what leads us to recognize without hesitation that from one situation another will follow. It gives no direction to what we traditionally call the 'arrow of time'."

restrict reason to the "bounded principle" of consciousness, which can deal only in resemblances, projections and analogies. The advantages of externalism for panpsychism are equally evident: nature necessitates reason and consciousness and indeed, on condition of these genetic externalities, is identical to them.

We now move on to the genetic or causal claim on the part of externalism. Hume clearly demonstrated that, as long as we remain within the bounds set by the experimental philosophy, causality remains an hypothesis grounded only in an anthroponoetic habit, and therefore not grounded at all. Grounding causality, therefore, will involve the abandonment of that philosophy. We have already encountered an alternative version of the causal thesis, one bound up with the principle of sufficient reason.

Leibniz formulated the principle of sufficient reason in a number of ways, of which we will cite two (thus ignoring its application to God's selection amongst possible worlds). In one form, it states that "there can be no fact real or existing, no statement true, unless there be a sufficient reason why it should be so and not otherwise" (*Monadology*, section 32). So stated, it involves the relation between *reason* and *existence*, although it does not specify the nature of this relation. In another form, however, it states "the full cause is equivalent to the entire effect" (cited Stengers 1997: 25). In this latter version, it specifies the nature of the relation as equivalence. How are we to understand the assertion of the *equivalence* of reason and existence, or of causes and effects? Clearly they differ, as there is more in reason that in existence (there are rationally possible non-existents), and more causes than have actual effects (or causes would no longer be causes). Moreover, if these are not two different principles, but one and the same, then the principle of sufficient reason involves equivalence relations between reason and existence, *and* cause and effect. Accordingly, to deny the principle would be to deny that the reason for existence is a causal one, and that existence is always the effect of reason. It does not stipulate which reason, nor which cause, merely that for a reason to *exist* is for causes to involve effects.

We propose that the externality thesis satisfies reason in that it makes nature equivalent to reason, on condition that equivalence is dynamically understood in the way we have outlined it. Once it is so understood, this equivalence is clearly causal. In Parmenidean terms, being = thinking entails that *being generates thinking*; in naturalistic terms, nature = reason entails that *nature generates reasoning*.

How, finally, does this leave the panpsychist claim? Having addressed the genetic and the complementarity dimensions of the externality thesis, we may note the following. Firstly, by the genetic dimension, nature thinks, or reasoning is one of the powers causally operative in nature. Secondly, by the complementarity dimension, thinking is finite with respect to the nature that generates it. Thirdly, if (nature = reason) = consciousness, then consciousness cannot account for its own genesis (Hegel's error and Schelling's insight), which can only be explained by a reason that exceeds consciousness (is not access-dependent) and is exceeded in turn by a first, a nature, that generates it and of which it forms part.

Before concluding, we return to Meillassoux's arguments where we left them. His claim is that since the principle of sufficient reason cannot be satisfied, unsatisfied reason must be turned into an ontological principle. In other words, the reason of existence is *ungrounded*. We do not wish to dispute the ungrounding thesis, but simply to assert that this ungroundedness *is nature*.

Core to contemporary debates concerning the metaphysics of nature is whether powers are regarded as properties of entities, or are ontologically basic. This is known as the problem of *ground*, otherwise known as the problem of sufficient reason. Introducing a physicalist understanding of this problem that was absent from, although implicit in, our discussion of Meillassoux's treatment of it, Molnar writes:

> The ground of a power, *P*, is the set of properties (all of which are conceptually distinct from *P*) by virtue of which a thing has *P*. The Thesis of Groundedness is the claim that necessarily all powers have grounds. I have argued… that this claim is falsified by the basic powers of the fundamental subatomic particles that appear to be ungrounded or pure dispositions. (2003: 147)

Although Molnar goes on to express doubts concerning the uniform applicability of the ungrounded argument to powers in general, the cost of its rejection is a dualism of property and entity that in effect denies powers their power-ness. This is because to be a power entails that it be a power *for* something, a disposition *towards* something that must, by virtue of being a power at all, be (at least) *possibly* operative. The cost of ungroundedness is a "physical intentionality" which entails, so Molnar, the 'threateningly panpsychist' conclusion that Thales was correct, and magnets are indeed "ensouled" (1993: 70). The dualism of power and substance is doubly apparent in the hypothesis of the 'magnet + soul' complex. Firstly, a powers ontology problematizes the spatiotemporal localization that makes an assertion of the type 'this is a magnet' possible. Rather than enabling an *a priori* distribution of discrete substances, that *there is a magnet* presupposes a solution to this problem in a nature composed of powers that Molnar has not provided. Secondly, that nature is composed of powers does not entail the existence of souls at all, but only a qualitatively variable continuum of physical intentionality, amongst which magnetism and thinking must number.

This second dualism, therefore, is apparent in the division of thinking from other physical intentionalities. As with the first dualism, a powers ontology provides no grounds for so doing. If, by contrast, powers are ungrounded, physical intentionality confirms even as it naturalizes Parmenides' identity thesis: *when* there is being, *then* there is thinking. Molnar's "threat" should therefore have concluded: 'when there is magnetism, thinking must follow.' Thus, by rejecting the dualism of reason and the other powers constituting nature, genetic externalism yields an ontology that confirms the principle of sufficient reason in each of its genetic stages, while entailing ungroundedness as a consequence of their nature.

4. Conclusion: Speculative physics and the ensouled magnet

We have argued that the genetic and the complementarity dimensions of externalism, which entail a dynamic ontology, accounts for the real existence of finitude and for a panpsychism all the way down, that is, without exception. This is because a rigorous dynamism entails the derivative nature of individuation, since individuation, or the production of products, is necessarily consequent upon production rather than prior to it. However, dynamism, although 'all the way down' never reaches ground, since were it to do so, powers would cease to have the ontological priority over their products, and would become instead modes or properties of a substance or subject whose nature would have to be determined all over again. That the 'pan' of *panpsychism* may have to be rescinded, therefore, by virtue of the genetic element of the externality thesis, this sacrifice recovers panpsychist claims from the anti-naturalist assumption that being = thinking constitutes an extra-physical relation, and thus makes conceptual room not for emergence as regards 'mindedness,' but for the accommodation of a naturalism that insists on the priority of physical production over product. We may thus take the naturalist sting out of the emergentist tail.

We have also argued that the problem of ground is most completely addressed through the thesis of ungrounding, both as regards the powers of nature and those of reason. This is because an analysis of ground that concentrates only on its rational dimension (the principle of sufficient reason) to the exclusion of its causal one 'denaturalizes' reason and cannot answer, therefore, the problem of its own generation. Regarding, therefore, what many will consider an implicit dual-aspect theory involved in the assertion of two classes of powers, the natural and the rational, we have argued that this is soluble by the genetic externalism we have drawn from Bosanquet, on the one hand, and the powers theorists, on the other. This does not mean therefore that reason must simply be naturalized in the manner to which much twentieth century philosophy became accustomed, but that the identity relation between being and thinking be conceived *genetically*. Geneticism entails in turn that the ground of thinking is being, and that of being is power, as the Eleatic Stranger proposed. A powers ontology, however, consistently carried through, entails that the powers are ungrounded. It is this that enables the panpsychist to eat physical rather than merely noetic cake.

Finally, by avoiding the internalist lure integral to the phenomenologizing, epistemologizing, or multiple minding solutions to the panpsychist problem, with their entailed subject-substantivism, reason is no longer tied to a particular class of entity. Whereas the finitist can only analogize or project intelligence onto plausible vehicles for a rationality judged by resemblance, externalism makes the following case plausible. When we say nature causes thinking, the thinking in question is no longer localizable within any given subject-substance. This being so, the causing of thinking is not as sparse in nature as the finitist weakly imagines.

CHAPTER 15

'Something there?'

James and Fechner meet in a 'Pluralistic Universe'

Katrin Solhdju

"If we desire a record of uninterpreted experience, we must ask a stone to record its autobiography." – thus did Alfred North Whitehead (1929/1978: 15) once express the will to have an unmediated knowledge about things, inherent to modern science. Instead of reading this phrase metaphorically, however, one can just as well understand it in a literal sense, and ask, What would it imply for our conception of reality if stones were actually able to tell their autobiographies?

Following the etymological meaning of 'autobiography,' this would imply at least three things: first, whoever has an autobiography must have some kind of *bios*, a life, in the sense of having some kind of temporal existence; second, it requires an *autos*, a self or self-referentiality; and third, the *bios* and the *autos* have to entertain a more or less steady relation and thus share a common trajectory that could express itself as a sort of autobiographical account. As I don't feel that I have the adequate means for asking a stone directly to tell me its autobiography, I would like to ask: Who did consider dead matter such as stones as having not only a history of their own, one that could be described objectively, but also considered them as living beings, and aimed at investigating their interior points of view, their *autos*, within the context of modern science? Who – to put it differently – supplied stones or other non-humans with an autobiographical capacity?

I propose to examine the views of two such philosophers: Gustav Theodor Fechner and William James. In Fechner (1801–1887), we find such a project at the basis of experimental psychology, in his analysis of psychophysics. The interests of this 19th century physicist and natural philosopher went far beyond the human psyche in relation to the physical human body; psychophysics as a philosophical endeavor is concerned with all parts of reality. Consequently Fechner considered each of these parts to entertain a perspective of its own, implying that it follows its own interests and expresses them in its own respective way. In a certain sense one could therefore claim that for Fechner, the universe was not only inhabited by an indefinite number of psychophysical beings, but it was also full of the potentiality for autobiographies to emerge.

It was the obsession with entering into a *relation* with many parts of reality, of trying to access their perspectives and getting to understand their respective interests – in short, Fechner's radically pluralistic attitude – that fascinated the American psychologist and pragmatist philosopher William James (1842–1910). Shortly before his death, James dedicated to Fechner a complete part of his lecture-series that appeared under the title *A Pluralistic Universe*, claiming that:

> He [Fechner] was in fact a philosopher in the 'great' sense, altho he cared so much less than most philosophers care for abstractions of the 'thin' order. For him the abstract lived in the concrete, and the hidden motive of all he did was to bring what he called the daylight view of his world into even greater evidence, that daylight view being this, that the whole universe [...] is everywhere alive and conscious. (1909/1996: 70)

For Fechner as for James the vision of reality as "everywhere alive and conscious" derived from a primary interest in psychology. Psychology, for them, was the science dealing with phenomena such as human perceptions, feelings, and emotions that were unquestionably present but often almost impossible to trace. In order to explore such things, psychology had no other possibility than to rely on introspection for a large part of its research. It is easily imaginable that researchers like Fechner and James, being confronted with the recalcitrance of such phenomena to purely objective approaches, started to think about the possibility that there might be other parts of reality that have an interior life of their own – parts that might lie completely beyond the reach of a scientific approach to reality. Maybe, they inferred, every part of reality has – just as human beings – an aspect that exact science, relying on quantification and objectivity, cannot access. This would be an interiority that requires a different approach, one that might rather be an endless process of approximation than of distanced objectification. Fechner's psychophysical approach to reality, as well as James' pragmatist philosophy, consider it their task to help render expressive the indefinite and heterogeneous plurality of interior perspectives – step by step, and case by case.

1. A psychophysical world

Fechner is a curious figure. Born in the small village of Gross-Särchen, Saxony, in 1801, he studied medicine in Leipzig. It was largely on the basis of his autodidactic studies of physics, however, that he was appointed professor of this discipline at the University of Leipzig in 1834. The experiments, or rather self-experiments, on optical vision and galvanism that he conducted during the following years weakened his health considerably, so that by 1839 he was forced to withdraw from his institutional functions. During a long illness Fechner turned towards the philosophy of physics, and was appointed professor of natural philosophy and anthropology in 1843.

Fechner's continuing interest in the relation between the physical and the psychical world found its most famous expression in his 1860 work *Elemente der Psychophysik*.

This book, however, derived constitutively from his joint studies of physiology with Ernst Heinrich Weber. Weber had experimentally worked on the psycho-physical relationship mainly with respect to the perception of touch (*Tastempfindungen*). The results of these experiments have to be considered as some of the main bases on which Fechner formulated the law of the so-called psychophysical parallelism. Also known as the Weber-Fechner law, this is an algorithm generalizing the relation between measurable exterior stimuli (physical) and interior perceptions (psychical).

Even though the Weber-Fechner law has been acclaimed as the theoretical basis of experimental psychology (as founded in the 1870s by Wilhelm Wundt), Fechner had a much larger vision of psycho-physics. For him the idea of a psychophysical parallelism was by no means a purely scientific, mathematical law, one that would allow for the exact quantification of physical facts and their relation to corresponding psychical reactions. The reduction of psychophysics to the Weber-Fechner law, and therewith to the couplet of stimulus-and-response that formed the basis of 20th century behaviorism, took up only one aspect of what Fechner had in mind.

It has frequently been pointed out that psychophysical parallelism might be traced back to Leibniz's idea of the two clocks that, having been started at the same time, function independently of one another but nonetheless seem to entertain some kind of relation. But Fechner's indebtedness to Leibniz's philosophy can be considered on a much larger scale than might appear from this particular example. One might even read Fechner's philosophy as a reformulation of Leibniz's monadology, in that he has replaced the monad by a psychophysical being. This is so because, in the end, Fechner's universe is one in which *all psychophysical beings together express reality as a whole*, each of them elucidating a particular part of it more clearly than all the rest.

Consequently, psychophysics was by no means a science that applied only to human beings, but rather was an approach that should include every kind of reality. What has so often been identified as the starting point of experimental psychology – Fechner's *Elemente der Psychophysik* of 1860 – thus appears as part of a much larger project; and it is a project that we can without hesitation address as both pluralistic and panpsychist.

2. Where to situate the realm of souls?

The publication of Fechner's *Elemente der Psychophysik* in 1860 is framed by the appearance of three of his other books: In 1848 *Nanna oder über das Seelenleben der Pflanzen* ('Nanna or on the Soul-Life of Plants') appeared, in 1851 *Zend-Avesta* and in 1861 *Über die Seelenfrage: Ein Gang durch die sichtbare Welt, um die unsichtbare zu finden* ('The question of the soul: A walk through the visible world in order to find the invisible one'). All four books shed different light on the question of psychophysical parallelism. In *Elemente der Psychophysik* Fechner mainly followed the physiological work of Weber, trying to give it a mathematically precise shape, whereas the other three books must be considered as part of his more philosophical work. Though approaching it in a different way, they each assemble around the problem of "the extension of the realm of soul through nature or the physical world (*Körperwelt*)". In *Über die Seelenfrage*, Fechner presents to his reader a whole catalogue of sub-questions to this problem that make the scale of his project quite obvious:

> Do human beings have souls? Do animals have souls? Do plants have souls? Do stones have souls? Do planets have souls? Does the cosmos have a soul?" (1861: 2)

All these questions, Fechner declares, require a perspective that has to be well-distinguished from the ones taken by mathematicians, physicists, chemists, geologists and physiologists, using their scales, telescopes, chemical reagents, gouge bits, microscopes and scalpels. All these disciplines focus on physical appearances: conceptualizing them, cutting them up, measuring them, or rendering them visible. The science of the soul, that is, psychophysics in its philosophical version, has on the contrary to find the means for addressing the interior standpoint of each being. It has to find a way of getting closer to the part of a thing that usually "appears to no one but to itself;" a part that is "luminous to itself but dark to any exterior eye" (ibid.: 9). With this claim, Fechner does not aim to put into question any scientific discipline; rather, he wants to complement them with another possible approach to reality, an approach that concentrates on the backside, the neglected, interior, and invisible side of things:

> Concluding something visible from the visible cannot be the same as concluding something invisible from the visible; it is rather added to it in a coordinated way. (p. 20)

The question arising is: How can we draw conclusions about an invisible realm of soul-life from the visible, material, or physical realm? Fechner accepts that such an exploration has no other choice than to rely on cases in which "it is possible to disclose something apparent, or to abstract something apparent from it" (p. 9). By this he means that knowledge about the interior perspective of a given reality – be it another human, an animal, a plant, a stone, a planet, or even the cosmos – can only be achieved through the *signs* they give to an exterior observer. Fechner thus, somehow paradoxically, aims at dealing with realities that by his own definition appear only to themselves, through an investigation that takes exterior appearances as its starting point.

Conscious of the paradox inherent to his investigation, he therefore also concedes that

> the whole soul-question is and will remain a question of belief [...] Exact proof relies on experience and mathematics; but only of our own soul can we have a direct experience; and mathematics lacks any extension to prove other souls. (p. 17)

The only possible substitute for an exact mathematical proof is to start from the only fact available to us, the experience that "Our own bodies have a soul."

3. Recording Plant-experiences

Fechner's first systematic reflections in this direction can be found in *Nanna oder über das Seelenleben der Pflanzen*. Therein he starts with the proposition that plants have an interior experience of their plant-being, which he terms the 'central' perspective or soul. Fechner's strategy of approaching the central perspective of psychophysical non-human beings is presented most concretely and explicitly in this text. In the introduction to *Nanna*, Fechner first of all announces his project of approximating interior experiences as an ethical way of dealing with reality:

> I want to lead my reader in such a world, and I want myself to precede the small beings and act as their interpreter. So that, just as every people has its representative, they do not have to do without a representative. Only the ones who would like to welcome this proposition have to follow my invitation. (1848: v)

As he takes the uniqueness of each experience seriously, Fechner does not provide us with a generally applicable method of how to enter into an interior experience; each phenomenon rather requires its respective adequate attention. Fechner envisioned the multiplicity of exterior perspectives on a psychophysical entity as a circle. He called the interior or psychical perspective the "central" one, and his approach to getting close to this interior experience was one of *circling around it* – but circling on a specific path that had to be chosen well, according to the interests of the investigated phenomenon. The plant, for example, would be confused and bored, he claimed,

> if there were all of the sudden a lot of scholarly philosophers around it, each of whom would start to question it in his own way about whether and what it knew about, and whether it possessed freedom, just because he had declared freedom to be the only soul-making thing. What should the plant answer? It understands nothing of such questions. (ibid.: 98)

The investigator's first task is therefore to find an experimental plane that allows for a real exchange with a psychophysical being. For the plants, Fechner consequently started his investigation on the plane of fragrances and smell, something plants produced and reacted to, and were thus obviously interested in:

> It would be odd if we – who are so clearly opposed to the life of flowers – enjoyed more of its sweetness than the faint echo of what is being enjoyed by the flower-life itself. (...) Should we thus not think that the flower, by the interior development and effusion of the sweet fragrance from its immanence, perceives it with a greater intimacy than we its exterior flow? (p. 34)

This passage implicitly contains two of Fechner's major propositions. First, each central perspective, that is each interior standpoint, brings about a specific quality of experience. Accordingly the exterior signs that a plant gives are very distinct from the ones we can perceive in other humans or animals:

> Surely what we see here are not the signs of perception of a human being, a cat, a sparrow, a fish, a frog, or a worm; rather it's the signs of perception of a fir, a

> willow, a lily, a carnation, a moss. This is because the soul-life of plants is not supposed to duplicate that of animals, but rather to complement it. (p. 61)

And second, each being aims primarily at (self)-enjoyment or (self)-pleasure. The requisites needed for full enjoyment, however, differ substantially from one being to the other. Fechner therefore puts forward the following speculation about nature:

> Rather the thought appeared to me, that [nature] might have built the water lily in such a way in order that there is a creature who can enjoy the entire delights furnished by bathing in the moist and in the light at the same time, a creature that can sense this through and through. And I continued to think that nature probably also built the mountain plant in a different way, and put it at a different location in order to bring the specific qualities that the mountain has to offer, such as the freshness and clarity of air – and whatever else distinguishes a mountain from a lake – to a pure and full enjoyment in a living being. This seems to be the case, I said to myself, as the water lily is specially adjusted to the water, and the mountain-plant to the mountain; or, if we prefer to reverse it, could we not as well say that water is arranged for the water lily, and the mountain for the mountain-plant? (pp. 52–53)

Reality thus appears as the never-ending addition of interior perspectives which aim at experiencing satisfaction. Such experiences, as becomes obvious, are never purely self-referential processes; rather, each psychophysical being requires exterior resources and thus an *exchange with its environment* in order to experience – and even more in order to enjoy itself. Plants, for example, are by no means self-sufficient, but employ, as one can easily observe from an exterior perspective, other plants as well as animals in their surroundings in order to stay alive and to reach satisfaction. Scientific knowledge about plant physiology and the modes of their reproduction, together with his own observations, led Fechner to an understanding of the life of a plant as a *network of communication*, at the center of which he suspected a soul. Bees fly back and forth carrying seeds from one flower to another, or pollen is simply blown by the wind. The plants, Fechner speculated, thereby exchange parts of intimate experiences:

> Moreover each chalice pours this fragrance into a thousand other chalices, and each chalice in turn receives it from a thousand others. As an invisible mist the fragrance moves from one flower to the other (...) The flowers themselves go to each other with it, although they seem to be fixed to the ground. Each flower-soul may thus receive a sensation of what goes on in every other flower-soul by the particles of other flowers that enter its window on the world. (p. 53)

By observing such processes and connecting them by analogy with our own experiences, Fechner claimed that we can sense, to a certain extent, what might go on in flower-souls. He compared the communication by fragrances with our communication by words. Words, he claimed, try to evoke an analogous situation (emotional and sensational) in another person. And he concluded by asking: “But is there only a thinking-with and -into other souls, and not also a sensing?” (ibid.).

Fechner's method is thus an experimental procedure in which a speculative element, such as the belief in the existence of plant-souls, is employed as a tool to connect realms thus far separated – namely, his own experiences and those of the plant. The plants for Fechner were consequently not passive objects *about* which he tried to gain knowledge; they were rather conceived of as individual psychophysical beings who were not only transformed by the experimental intervention of a human being, but also who effectively transformed his perception of reality. They succeeded in transforming Fechner because he enabled them to show him that they were in a permanent reciprocal interaction with their environment, employing it for their own means and being employed by its various parts respectively. In observing plants with the presupposition that they comprise of two sides, just as oneself does, Fechner, one could say, gave them the chance to express or articulate themselves as *double*: as physical as well as psychical beings. Experimentation led by analogical interpretation is thus Fechner's way of substituting for both direct experience and exact mathematical proof.

Thus his practice consisted less in trying to access the interior experiences of a plant in a direct way than in becoming sensitive to its operational relations in order to grasp some of its soul-life indirectly. In *Über das Seeleneben* (1861: 20) Fechner epitomized the logic of his empirical and interpretative practice as follows:

> In fact, no alien soul can be seen or grasped directly; however, it is possible to see and grasp much that is related to its existence, and by grasping such elements together one can at the same time grasp something of the alien soul.

Fechner's claim that reality is everywhere full of souls is thus more than an abstract *a priori* definition. His philosophy rather has to be conceived of as an experimental practice that starts with concrete observable realities, and then tries to enter into some kind of responsive rapport with them. As within any experimental procedure there are some presuppositions made which direct not only the experimenter's attention but also the possible range of activity that the objects experimented with might show. Fechner thus aims at giving a chance to reality to *express itself* in ways that resonate with his primary hypothesis, that is, the existence of an indefinite number of souls. His hypothesis thus not only enables him to interpret the exterior signs he encounters, e.g. in plants, as expressions of their interior psychical activity, but it also enables the plants to be expressive in such a way that their soul-life gets accounted for in a realm outside of the one they are usually in exchange with. Fechner's philosophical practice can thus be described as the *active experimental production of a panpsychist reality* – a reality that he did not conceptualize *a priori* but that rather revealed itself to him in the process of explicitly entering into a relation with its various concrete parts.

4. Experiential Knowledge

The starting point of these experiments was, consequently, not a clear conception of plant souls. Fechner tells us rather of a vague idea that one day crossed his mind as he found himself observing a water lily:

> On a hot summer's day I was standing at a lake observing a water lily which had smoothly put her leaves over the water and was taking a sunbath with an open blossom. How exquisitely well this flower had to be, I thought, as she plunges her upper part into the sun and the lower one into the water, if she could sense anything of the sun and the bath. And why, I asked myself, should she not do so? (1848: 52)

What Fechner describes here as the initiative experience for him to start his investigation of plant souls might be conceptualized in terms of what William James later called an experience of 'something there.' James introduced the 'something there' primarily to describe an experiential event that could not be reduced to any of the senses, an event that occurred at the fringes of experience, e.g. in mystical states, hallucinations or drug-induced trances: "*a sense of reality* [...] more deep and more general than any of the special and particular 'senses' by which the current psychology supposes existent realities to be originally revealed." (1902: 58) In exactly this sense Fechner could not see or hear or touch or smell or taste the souls of plants, but nevertheless had the vague feeling that there was 'something there' that transcended purely exterior appearance, and that he tried to access by interpreting the relations they entertained. What James admired as Fechner's "intense concreteness" was thus his attempt to take into consideration intermediate tones and nuances for the extension of reality through the interstices of what was obvious at first sight.

It is patient work that takes concrete realities as a starting point for speculation about all possible potentials inherent to them. It was this bottom-up method, as one might call it, as opposed to idealist abstractions on the one side and materialist ideology on the other, that made for James' fascination with the founder of psychophysics. James defined his own 'radical empiricism' methodologically as an approach that

> must neither admit into its constructions any element that is not directly experienced, nor exclude from them any element that is directly experienced. For such a philosophy, *the relations that connect experiences must themselves be experienced relations, and any kind of relation experienced must be accounted as 'real' as anything else in the system.* (1912/2003: 22–23)

In this sense Fecher was, to James, a practitioner of this method *par excellence*.

An 'experience' within radical empiricism, and at least implicitly also for Fechner, is not reducible to isolated and passive objects on the one side and sensitive experience *of* them on the other. As we have seen, Fechner in his practice rather assumed relations to be constitutive parts of things. James had already expressed the importance of taking relations into consideration in his *Principles of Psychology* when he claimed that

"We ought to say a feeling of *and*, a feeling of *if*, a feeling of *but*, and a feeling of *by*" (1890/1950, Vol. I, p. 245).

In the same way James was interested in knowledge mainly insofar as he considered it to be a relational practice:

> the knower is not simply a mirror floating with no foot-hold, and passively reflecting an order that he comes upon and finds simply existing. The knower is an actor, a co-efficient of the truth on one side, whilst on the other he registers the truth which he helps to create. (1878/1920: 67–68)

In order to better understand such a concept of knowledge, however, we should slow down for a moment and try to grasp how James arrived at radical empiricism that has to be considered both as a method and as an epistemology. I therefore suggest we follow the evolution of the concept of experience within James' work, from a narrow anthropological focus towards a much broader concept. This change becomes most striking if we compare two quotations, one deriving from James' early psychological works the other from his *Essays in Radical Empiricism*. Whereas in the *Principles* 'experience' was defined as an "*experience of something foreign supposed to impress us*" (1890/1950, Vol. II, p. 619), and thus being clearly attributed to humans, the late James came up with "the supposition that there is only one primal stuff or material in the world, a stuff of which everything is composed, and [...] we call this stuff 'pure experience'." (1912/1996: 2f.). While experience in the first sense is referred to as something that *we*, as human beings, have, it has, in the second one become something that the whole of reality is made of; 'experience' has thus grown significantly.

From an *a posteriori* perspective, however, the earlier citation already implicitly opens up the possibility of a non-anthropological concept of experience, or at least might be interpreted in this way, envisioning James' later "supposition." In addition to being attributed to human beings alone, experience is here described as a process in which *one thing leaves an impression on another thing*. Experience is thus, first of all, the effect of something exterior on something interior. But this does not mean that having an experience is purely receptive. An experience is already in the *Principles* always a reaction towards something that is being noticed and taken into account or appropriated as one's own. And such experiential reconfiguration is never one-sided; instead, the foreign exterior reality undergoes a transformation at the same time that the self is transformed by the act of taking it into account as an impression. The exterior reality as it is accounted for also undergoes some kind of transformation, shifting from one state to another as it is impressed by something – and thus *it experiences*. In this sense, James' early concept of experience already has a tendency to blur the strict opposition of the subject and the object of an experience, as he considers both to play an active role within the process of their reciprocal experiences.

Experience is consequently a fundamentally *plural* event, in which resonances between formerly separated realms merge. And what appears in the resonating interstices of formerly unacquainted things potentially renders a plane for novel insights. For this plane of potentiality, James later invents the concept of 'pure experience,' that is to say, an experience outside of dualities, a direct experience that can then be attributed to every part of reality. Looking at it another way James might address 'pure experience' as the stuff "of which everything is composed."

'Pure' in James' understanding does not designate a state prior to experience, like Condillac's statue or Adam in paradise; pure experience is rather everyday lived experience "considered from an immanent point of view" (Lapoujade 2000: 191). It is thus close to what Fechner had addressed as the 'central' perspective of a given reality. Having a pure experience requires nothing but having or undergoing some kind of transformation. And consequently everything that is in relation to something else can have pure experiences in the process of transformation, of changing positions. One of the things that may come about in a process of experience is human consciousness; another may be the soul of a plant or an autobiographic stone, which in this process "is both constructed and reveals itself." (ibid.: 196).

And accordingly, pure experience is not exactly "one stuff" in the sense of one general principle that presides over reality; rather, there are "as many stuffs as there are 'natures' in the things experienced." (1912/2003: 14). Pure experience is thus firstly an immediate and immanent experience on a plane beyond any bifurcation between the object and the subject, or between thoughts and things. "The instant field of the present is always experience in its 'pure' state, plain, unqualified actuality, a simple *that*." (ibid.: 39).

Following this, a definition of the concept of pure experience can then be radicalized in the sense that it can be extrapolated to all kinds of non-human realities. David Lapoujade illustrates this by taking the example of reactions between chemical substances. He suggests that there is a Jamesian sense of an "*experience of crystallization* between chloride and sodium" that takes place in or between the respective substances. In other words, the chemicals in this process are *active interior experimenters* of their transformation:

> It is the chloride and the sodium which crystallize; it is they which can therefore rightly be said to be undergoing the experience of crystallization. Insofar as it is pure, experience can be said both of "subjects" and "objects" (in a manner of speaking of course, since at this level we are dealing with neither). (2000: 193)

Radicalized in such a way, James' concept of pure experience clearly provides us with tools to go beyond an anthropological perspective and to integrate non-human actors or experimenters into a radically empiricist conception of reality – one in which they play an active role in the process of reality's creation.

5. Knowledge as a relational practice

James opposed the simple *that* of pure experience with a more definite *what*, which corresponds to a verified (and purified) *knowledge about* something that he opposed to *knowledge in transitu*. Pure experience thus is not a purified (or cleansed) version of experience but rather the opposite, the most impure and chaotic one. From an epistemological point of view James (1912/2003: 2–3) says that

> the knowing can easily be explained as a particular sort of relation towards one another, into which portions of pure experience may enter. The relation itself is part of pure experience; one of its 'terms' becomes the subject or bearer of the knowledge, the knower; the other becomes the object known.

Pure experience thus goes on all the time, as "portions of it enter" into already given relations, and by unsettling them, enable the evolvement of a sphere in which positions have to be negotiated again. Consequently, this process of getting to know and of integrating these portions into our construction of reality also transforms knowledge about reality. A sensitivity to immediate or pure experiences therefore does not only play a role in self-relations and self-knowledge, but such sensitivity is an instrument that lies at the basis of getting to know or being acquainted with reality. Gaining an adequate understanding of reality's multiplicity thus presupposes a readiness to enter this insecure sphere, to be sensitive to "an intermediary reality outside of any matter/form relationship" (Lapoujade 2000: 193), in which new and unexpected affinities can emerge.

Like classical empiricism, radical empiricism begins with plural facts – a multiplicity of experiences of phenomena – and therefore, as James suggested, can be called a mosaic philosophy. There are two specificities that come with the *radical*, however, that we should keep in mind. First, radical empiricism abandons the dualist distinction between a material and a mental world; things are real whether they are experienced in our thoughts or in a material reality. Both interconnect and there is no substantial difference between them. Second, and consequently, radical empiricism grants relations as interior to things, and thus puts the relations on the same plane as things and thoughts. Radical empiricism focuses on conjunctions rather than on disjunctions, on passages, interstices, and processes rather than on oppositions. A radically empirical approach to reality therefore has to get away from dualist oppositions that imply hierarchies – such as material versus mental facts, subjects versus objects, humans versus non-humans – and consider all of them on one and the same plane, all as equally real as long as they are experienced.

> There is, I mean, no aboriginal stuff or quality of being, contrasted with that of which material objects are made, out of which our thoughts of them are made; but there is a function in experience which thoughts perform, and for the performance of which this quality of being is invoked. That function is *knowing*. (1912/2003: 2)

Knowledge as a noun does not appear in this quotation, and this is not an accident. James pleaded for the investigation of *processes and practices of knowing* rather than for a *theory of knowledge* that is interested in resulting facts or objects that are clearly distinct from their experienced emergence. Novelty only evolves in open experiential processes in which things that were previously separated are now linked to one another, are disconnected and reconnected again, until a configuration arises in which they take a clear position and can thus be defined and known. A new thing adds something to reality as it also adds to our knowledge about reality, and thus signifies the end of one specific process. At the same time, however, the result of such a process of getting to know a new phenomenon – like a new document added to an archive – has an effect on the complete system, as it shifts the relations between the things that were already there. Each novel thing that comes to be known thus takes part in the creative transformation of reality, which then serves as a plane for future experiences *ad infinitum*.

It is these processes of getting to know something in the sense of *noscere (kennen*, *connaître)*, rather than on *scire (wissen*, *savoir)*, knowledge *about something* – or as James put it, of "knowing as in transit or on its way" as opposed to "knowing as verified and completed" (ibid.: 35) that lie at the center of his interest. The process of getting to know another person, for example, is, by definition, endless. Knowing in the context of human relations obviously implies a strong personal investment; getting to know the other is only possible in a process of reciprocal exchange. Such an exchange presupposes some kind of nearness, a connecting thread, a resonance that can serve as a starting point for a network of common experiences. Common experiences form what James described as *knowledge-of-acquaintance*, a knowledge that is fundamentally reciprocal and in transit. The kind of relation, the respective knowledge about the other that will be established between the two experimenting actors, then depends largely on the quality of their shared experiences. And this relation that is defined by the positions of the participating experimenters towards each other is in permanent motion, and will continue to generate effects endlessly. We have to take seriously this idea that the transformations that are noticed and taken into account in the process of an experience happen in the *exterior reality* as well as inside the experiencing subject. This example of getting to know one another by building up a plane of common experiences can, without much effort, be extrapolated to the realm of getting to know non-human actors of any kind – and for that matter, of non-human actors to know each other.

Accordingly for James (1975: 32) experience is "the vehicle or medium connecting knower with known"; it is *between* them. Drawing from this, it becomes understandable that knowledge about things that aims at being adequate to their reality has to take into consideration each part of experience as a resource of mediation that precedes all later discrimination between subjects and objects. Experience is constitutive of both of them. And subjects and objects thus have to be approached from the point of view of the experiential becoming of their relationship; they are not clearly separated entities per se, but rather a common process of growing affinities that ends in their distinction.

Even if James' concept of knowledge is thus not panpsychist in the strong sense it is, nonetheless, panexperientialist. James conceived of radical empiricism as being closely linked to a panpsychist view of reality. Whereas he only hinted to this in the *Essays of Radical Empiricism*, there is more than one incident in which he more or less explicitly referred to panpsychism. One is particularly interesting with respect to what we took as the starting point for this chapter: the emergence of a new kind of panpsychism from within the realm of experimental psychology, represented here by Fechner and James, and with it the problems that come with the method of introspection:

> The only fully concrete data are, however, the successive moments of our own several histories, taken with their subjective personal aspect, as well as with their "objective" deliverance or "content". After the analogy of these moments of experiences must all complete reality be conceived. Radical empiricism thus leads to the assumption of a collectivism of personal lives (which may be of any grade of complication, and superhuman or infrahuman as well as human), variously conative and impulsive, genuinely evolving and changing by effort and trial, and by their interaction and cumulative achievements making up the world.
> (James 1903/1920: 443–444)

6. Conclusion

It has become obvious that the panpsychist question lay at the very center of Fechner's work, whereas James rather touched upon it as a consequence of his methodological and epistemological conception of radical empiricism. Fechner explicitly experimented with a panpsychist universe that he considered as "everywhere alive and conscious". James arrived at what he, at one point, termed the doctrine of 'pluralistic panpsychism' (in Perry 1935: 373) by the extension of his concept of experience. By 'pluralistic panpsychism' he meant, as he stated explicitly, that "material objects are 'for themselves' also" (ibid.: 745), thus expressing a view close to what Fechner addressed as a thing's capability for self-enjoyment.

For James this panexperientialist view was at the same time closely linked to his adherence to evolution theory. Was it possible that evolution brought about conscious beings if its basic materials completely lacked such a function? Arguing in a strict evolutionist framework, James' answer to this question was clearly 'No', as therein no new substances could be added to the original ones in the evolutionary process. "In this story [of evolution]," James writes already in *The Principles of Psychology* (p. 146), "no new *natures*, no factors not present at the beginning, are introduced at any later stage." Rather, "[T]he point which as evolutionists *we* are bound to hold fast to is that all the new forms of being that make their appearance are really nothing more than results of the redistribution of the original and unchanging materials." (ibid.; my italics). If we thus want to attribute consciousness to any being, it must have existed, at least latently, in all the others from the very beginning on, and must still exist in them today: "*If evolution is to work smoothly, consciousness in some shape must have been present at the very origin of things.*" (ibid.: 149)

Taking all this together, James' interest in Gustav Theodor Fechner gains a significance that goes far beyond the pure fascination for Fechner's innocent approach to reality. "The original sin, according to Fechner," (and we can now add, according to James), "of both our popular and our scientific thinking, is our inveterate habit of regarding the spiritual not as the rule but as an exception in the midst of nature." (1909/1996: 70).

CHAPTER 16

Panpsychic presuppositions of Samkhya metaphysics

Jaison A. Manjaly

> One endowed with the knowledge of the twenty-five principles will undoubtedly get salvation, no matter in what stage of life he is – whether he has matted hair, or is shaved or has top-knot. *Gaudapada-bhasya of Samkhyakarika*

Samkhya, one of the early philosophical schools in the classical Indian tradition, inherited its name from the enumeration of ontological principles. Samkhya literally means 'number.' It is also used as a synonym of 'enumeration.' As a philosophical system Samkhya built an inventory of ontologically real principles/entities, fundamental attributes, fundamental dispositions and fundamental characteristics. Samkhya metaphysics conceptualizes the universe as composed of two ultimate principles: *Prakrti* (primordial materiality) and *Purusa* (primordial consciousness). Prakrti evolves and further manifest itself into 23 principles. Purusa does not evolve but facilitates the evolution of Prakrti. All the principles except Purusa are material. Purusa, on the other hand, is not supernatural or nonphysical but only a fundamental principle which 'witnesses' Prakrti and its evolutes. This naturalistic interpretation of fundamental principles is, therefore, one of the unique achievements of the Samkhya School which is also one of the *realistic* schools in classical Indian philosophy.

As a school of thought Samkhya falls into the orthodox tradition which accepts the authority of Vedas and Upanishads. Samkhya accepts Vedas as the means of knowledge which is at par with perception and inference. Samkhya School also subscribes to other Vedic and Upanishadic views. It is argued that Vedas and Upanishads house some of the early philosophical thoughts of Samkhya in its proto form (Larson & Bhattacharya 1987). The development of the Samkhya system was initially based on these treatises which were instrumental in building a distinctive school of thought.

The ontological inventory of Samkhya philosophy is built on certain panpsychic presuppositions. An analysis of these presuppositions is offered in this chapter. I will describe how the Samkhya conception of panpsychism escapes the problems of contemporary conceptions of panpsychism, especially, the version proposed by Strawson (2006). Some of the assumptions of panpsychism as discussed by Strawson are brought in to show that there is a fundamental flaw in the conception of experience/consciousness as a fundamental property. This chapter further shows how Samkhya metaphysics overcomes this difficulty by bringing an ontological distinction between *experience* and *consciousness*.

1. Presuppositions of panpsychism

The contemporary metaphysical framework of panpsychism presupposes consciousness as a fundamental property, on par with other fundamental properties like size, shape, charge etc. However, physicalists and property dualists disagree on the metaphysical status of consciousness. Strawson argues that experiential properties are physical in their metaphysical make-up but stand apart from other physical properties in terms of their metaphysical manifestations. His framework of panpsychism strategically aligns itself to the physicalistic metaphysics. According to him there is nothing over and above physical facts. Property dualists, on the other side of the spectrum, claim that consciousness as a fundamental property is not physical. Rather than looking into the debate, this chapter looks into the presuppositions of panpsychism. I consider Strawson's conception as one of the systematic expositions of panpsychism and his assumptions are treated as the presuppositions of panpsychism.

Strawson assumes that all concrete reals are physical and hence consciousness/experience which is concrete is also physical. If the nonphysicalists disagree with this assumption, I would advise them to ignore the physical aspect of reals for the time being. Irrespective of any metaphysical commitment, Strawson's assumption presupposes a plurality of concrete reals, which could be considered the initiation to panpsychism.

Strawson further assumes that brute emergence is impossible, which is also an acceptable proposition irrespective of any metaphysical commitment. This assumption is the sustaining force of panpsychism. The impossibility of brute emergence rules out the possibility of consciousness emerging from completely non-conscious substances. Strawson admits micro-experiential/conscious properties, which according to him are "intrinsically suited to constituting certain sorts of experiential phenomena in a certain way" (2006: 21). Unless we are prepared to admit the presence of micro-mental properties as a fundamental real in everything physical, emergence theory remains inconsistent.

Plurality of reals and impossibility of brute emergence are, therefore, fundamental to panpsychism. Samkhya School has debated these presuppositions, which implies the existence of a coherent and robust theory of panpsychism in classical Indian philosophical tradition. Interestingly the presuppositions of Samkhya are similar to the presuppositions of current conception of panpsychism. Samkhya presupposes the following:

- Plurality of fundamental entities;

- Plural and ubiquitous conscious principle (Purusa);
- Distinction between consciousness and experience.

These presuppositions are not subsidiary, but central to Samkhya School, and all of them have retained their conceptual clarity across the centuries. I take up on these three assumptions to examine how Samkhya conceptualizes panpsychism, and I will also to bring them into the current debate on panpsychism.

2. Plurality of fundamental entities

Samkhya metaphysics is *realistic* and at the same time *pluralistic*. It presupposes a multitude of principles/entities (*tattvas*), attributes (*gunas*), and predispositions (*bhavas*). An introduction to fundamental principles/entities and fundamental attributes would suffice to see how this plurality of principles has been conceptualized.

Fundamental principles or entities are 25 in number, and they are as follows (Larson & Bhattacharya 1987: 49):

- ***Purusa*** (primordial consciousness) and ***Prakrti*** (primordial materiality).
- ***Buddhi/Mahat*** (Intellect), ***Ahamkara*** (Ego) and ***Manas*** (Mind).
- ***Jnanendriyas*** (five sense capacities): hearing (*srotra*), touching (*tvac*), seeing (*caksus*), tasting (*rasana*) and smelling (*ghrana*).
- ***Karmendriyas*** (five action capacities): speaking (*vac*), grasping/prehending (*pani*), walking/motion (*pada*), excreting (*payu*) and procreating (*upastha*).
- ***Tanmatras*** (five subtle elements): sound (*sabda*), contact (*sparsa*), form (*rupa*), taste (*rasa*) and smell (*gandha*).
- ***Mahabhutas*** (five gross elements): space (*akasa*), wind/air (*vayu*), fire (*tejas*), water (*ap*) and earth (*prthvi*).

These 25 categories are called *principles* (*tattva*) of reality. The principles are also interpreted as fundamental *entities* of the larger metaphysical framework of the universe.

They may be classified or organized in two distinct ways. The first way is according to causal status. There are four possible causal categories, depending on whether or not a given principle is causally efficacious (i.e. can cause change in other principles), or is causally susceptible (i.e. can be changed by other principles). The four categories are defined as follows:

(1) *Evolvent*: causal.

(2) *Evolute*: caused.

(3) *Evolvent-Evolute*: both causal and caused.

(4) ∼(*Evolvent-Evolute*): neither causal nor caused.

The first ultimate principle, Purusa, stands alone among the 25 as ∼(evolvent-evolute); it has neither causal power, nor can it be affected by anything. It is eternal and unchanging. The second, Prakrti, stands alone as evolvent; it has causal power on all but is unaffected by anything.

Of the remaining 23 principles, three have the status of evolvent-evolute: Buddhi/Mahat, Ahamkara, and Tanmatras. Buddhi is caused by Prakrti, and causes Ahamkara. Ahamkara additionally, as ego, is causal on Tanmatras (subtle elements), Jnanendriyas (sense capacities), Karmendriyas (action capacities), and Manas (mind). Tanmatras, in turn, are causal on the gross elements (Mahabhutas). The final category, evolute, includes the remaining 16 principles: Manas (mind), Jnanendriyas (five sense capacities), Karmendriyas (five motor capacities), and Mahabhutas (five gross elements). These 16 are susceptible only, and have no causal power of themselves.

These causal relations are summarized in the Table below:

Principle		**Caused by:**	**Causal on:**	**Causal Category**
Purusa	(consciousness)	nothing	nothing	∼(Evolvent-Evolute)
Prakrti	(materiality)	nothing	Buddhi	Evolvent
Buddhi/Mahat	(intellect)	Prakrti	Ahamkara	Evolvent-Evolute
Ahamkara	(ego)	Buddhi	Manas, Tanmatras Jnanendriyas, Karmendriyas	Evolvent-Evolute
Manas	(mind)	Ahamkara	nothing	Evolute
Tanmatras	(5 subtle elements)	Ahamkara	Mahabhutas	Evolvent-Evolute
Mahabhutas	(5 gross elements)	Tanmatras	nothing	Evolute
Jnanendriyas	(5 sense capacities)	Ahamkara	nothing	Evolute
Karmendriyas	(5 motor capacities)	Ahamkara	nothing	Evolute

This structure reflects the causal relationship among the evolvents and evolutes. Note that the two ultimate principles – Prakrti and Purusa – are *non-evolute*, that is, are not affected by anything. They alone are eternal and unchanging. However, the nearness of Purusa disturbs the equilibrium of Prakrti, which triggers the causal chains and facilitates evolution. The other 23 principles are *all* evolute; they all are susceptible to change and evolution.

Schematically, the causal chain can be represented as:

(Purusa) (Prakrti) → Buddhi → Ahamkara →
(Manas+Jnanendriyas+Karmendriyas+Tanmatras → Mahabhutas)

Secondly, the 25 fundamental principles can also be classified into three categories: (1) the Manifest, (2) the Unmanifest and (3) the Knower (*Samkhyakarika* II). Prakrti is the all-encompassing material principle, from which the other 23 principles (apart from Purusa) evolve. These 23 evolutes of Prakrti are manifests, while the root material principle itself is unmanifest, and the primordial conscious principle (Purusa) is the knower. Primordial materiality does not manifest itself; rather it is manifested *through the evolutes*. This distinction matches with the Kantian conception of Noumena and

Phenomena, where Prakrti could be identified as noumena and other principles as phenomena.

Purusa is in addition to this noumena / phenomena distinction. It is neither manifest nor unmanifest. It is in itself a principle with an independent existence. Its proximity to Prakrti results in evolution. Samkhya holds that the conscious principle and the primordial materiality are in a *state of co-presence*, but do not causally influence each other.

Prakrti is subtle because it is not an object of perception. However, Samkhya claims that we have inferential knowledge about Prakrti, via the manifest principles. The other 23 principles are described as: "caused, non-eternal, non-pervading, active, manifold, dependent, mergent, conjunct and subordinate" (*Samkhyakarika* X). The unmanifest Prakrti is characterized with all the *reverse* of these attributes. But if the attributes of the manifest and the unmanifest are diametrically opposite this violates the Samkhya principle of *satkaryavada*, that is, the effect is not completely independent of the cause. According to Samkhya,

> The effect is existent (in its cause), since, non-existent cannot be produced, since the material (cause) is selected, since everything cannot be produced (from anything), since a potent (cause) produces that of which it is capable, and since (effect is) of the same nature as the cause. (*Samkhyakarika* IX)

If the cause and effect have commonalities, how can Prakrti be completely different from its effects? Samkhya seems to strike a balance here. Although the above mentioned attributes are not shared by Prakrti, there are other attributes common to Prakrti and all manifest principles:

> The manifest is composed of the three attributes, non-discriminated, objective, general, non-intelligent and productive. So also is the Nature (Prakrti). (*Samkhyakarika*, XI)

The three attributes present in Prakrti and its evolutes are *sattva*, *rajas* and *tamas*. As I explain below, these represent *pleasure*, *pain*, and *indifference*, respectively. The existence of common attributes therefore nullifies the possible objection.

The rejection of brute emergence would also be applicable to the subjective realm such as experience. Experience according to Samkhya is a (non-brute) emergent *disposition*. It emerges from the operation of intellect (*buddhi*), ego (*ahamkara*) and mind (*manas*) – the three highest evolutes.

The union of these principles is called the *anthahkarana*, or 'internal organ.' Anthahkarana along with three attributes (*sattva*, *rajas* and *tamas*) in conjunction with other sense organs facilitate the emergence of experience. *Buddhi*, *ahamkara* and *manas* represent the three aspects of: *knowing*, *willing* and *feeling* (or, cognition, conation and affection), respectively. Without this internal organ, the external sense organs cannot function as organs of cognition. For cognition is facilitated by the internal organ, by enabling the external sense organs to contact the objects of cognition.

Experience is therefore conceived as a (non-brute) emergent property of the interplay of multiple factors, such as, internal organ, external sense organs and the three attributes. This implies that experience is possible only in sentient entities, as it requires bringing multiple factors into action. If experience is a unique property of sentient beings, how is panpsychism possible within the Samkhya metaphysical framework? Samkhya answers that there are *common underlying fundamental facts* present in all the evolutes – most significantly, the three attributes.

Strawson (2006) solves this problem by bringing in a micro-macro distinction of the experiential property. He claims that micro-conscious properties of ultimates have evolved into macro-conscious properties in humans. Micro-conscious properties are fundamental to everything physical, but macro-experientiality is present only in highly complex organisms.

A similar but different explanation of this micro-macro distinction can be drawn from Samkhya metaphysics. In Samkhya, *sattva*, *rajas*, and *tamas* (the attributes which are common to Prakrti and its evolutes) can be identified as the micro-experiential facts. *Sattva* is 'illumination,' and is the principle of pleasure. *Rajas* is stimulating and dynamic, which represents pain. *Tamas* is characterized as indifferent, heavy and inactive. The combinatorial effect of these three attributes determines the nature of all derivative principles enumerated by Samkhya:

> The attributes are of the nature of pleasure, pain and delusion; they are adapted to illuminate, to activate and restrain. They mutually suppress, support and produce, consort and exist. (*Samkhyakarika* XII)

The specific *nature* of the internal organ, which consists of intellect, ego and mind, is determined by the combination of these three attributes. According to their variations, the subjective realm acquires its particular characteristics. It is also important to note that the internal organ alone is not responsible for subjectivity but only when it comes in contact with the sense organs.

Moreover, Samkhya holds that *subjectivity is part of primordial materiality* (Prakrti). This establishes the material nature of subjectivity. Samkhya does not seem to hold an antagonistic opposition between subjectivity and objectivity as seen in the dualistic metaphysics. However, a similar distinction of subjectivity and objectivity is found among the materialists. Strawson also seems to subscribe to this distinction, but adopts a 'removal strategy' of this distinction by forcing the experiential into the physicalistic metaphysics. But he still holds to a distinction between the physical and the experiential.

This distinction is blurred in Samkhya metaphysics. Subjectivity according to Samkhya is a (non-brute) emergent property, and the depth of this subjectivity or experience varies according to the combinatorial presence of the three attributes. Larson and Bhattacharya (1987) propose that subjectivity is not ontologically distinct from the objective materiality, but a particular approach to objectivity. According to them:

> There is no polarity or bifurcation of subjective and objective within tripartite process, no ontological distinction between "mind" and "matter" or "thought" and "extension." The subjective flow of experience is simply another way of describing the objective primal material energy that unfolds in a continuing

> tripartite process of spontaneous activity, rational ordering and determinate. formation (p. 67)

However, physicalism and dualism, irrespective of their metaphysical commitments, presuppose the ontological distinction between mind and matter. The Samkhya metaphysical approach to this problem is different. It maintains that there is no ontological distinction between the experiential and the material, but that both have only *epistemic* values. That is, there are two different ways of knowing objects when there is an interplay of the internal organ, the three attributes, and sense organs. This interplay is a continuous and ever-existing process. Hence *subjectivity is ubiquitous*, and coded into *all* the fundamental principles. But *concrete* subjectivity is not ubiquitous, but emerges, in a non-brute fashion, according to the nature of combinatorial effect.

3. Plural and ubiquitous conscious principle (Purusa)

The root meaning of *Purusa* is 'man,' in the ordinary sense. The Vedas and Upanishads use this term as synonymous to *atman* (self). It is also used to signify the ultimate cosmic reality. In Samkhya metaphysics Purusa refers to the primordial conscious principle. The existence of the conscious principle is established by various inferential facts. Samkhya claims primordial materiality (Prakrti) and the other 23 evolutes could not have existed without primordial consciousness, for there must be at least one principle to oversee the existence of other entities. Furthermore, the *purposiveness* of other entities is completely dependent on the conscious principle – the 'one who knows':

> The spirit (Purusa) exists, since composite (objects) are meant for another; since it is the reverse of that which has the three Attributes and the rest; since there must be control; since there must be someone who enjoys; and since there is activity for release. (*Samkhyakarika* XVII)

Samkhya allows for the multiplicity of Purusa, which is *conscious and present in all the entities/principles*. The plurality of Purusa is established by the fact that there are pluralities of real entities. Samkhya claims that if there were only one Purusa, all entities would have undergone similar changes if any one entity underwent change. This claim presupposes that the primordial *consciousness* is ubiquitous, and Samkhya thus subscribes to an account of panpsychism that is different from Strawson:

> Plurality of the spirit is established, because birth, death and organs are allotted separately, because there is no activity at one time, and because there are different modifications of the three Attributes. (*Samkhyakarika* XVIII)

In the previous section I have shown that, like the conscious principle, the *experiential* component in Samkhya metaphysics is ubiquitous as well. But Samkhya makes a distinction between experience and consciousness. The conscious principle in Samkhya is Purusa and it is conceived as the witness and the observer (*Samkhyakarika* XIX). The notion of witnessing has to be understood as an ability to *reflect upon*. A witness is the one who *sees through the surrounding*. Prusua as a witness is not an alien entity looking at other entities from some distant place. It is an existential attribute shared by all entities. The notion of consciousness in this context is not similar to the traditional understanding, which is equivalent to experience or awareness. In the Samkhya philosophical context it does not mean awareness but a contentless or pure consciousness. Pure consciousness is a state of wakefulness or a state of witnessing. The pure consciousness receives its content through experience, when the internal organ, fundamental attributes and external sense organs come together and present the object of experience to the Purusa.

Experience is not identical with consciousness, but is the *content* of consciousness. However, this does not mean that we can undergo experience without being conscious of it. This possibility is ruled out because Purusa, the conscious principle is ubiquitous and all instances of experience are presented to Purusa. The depth of experience which is decided by the fundamental attributes could vary among different entities, which would also determine the nature of consciousness.

4. Evolution of consciousness

It has been shown that, in Samkhya, both the conscious principle and experiential facts are ubiquitous. This two-tier conception of panpsychism is less problematic than Strawson's. There are problems with his micro-macro distinction when applied to fundamental properties. If consciousness is a fundamental property, the micro-macro distinction cannot hold, because *fundamental properties do not evolve*. However, Strawson claims that evolution plays an active role in transforming the micro-consciousness to macro-consciousness. I argue that the concept of micro-consciousness and evolution of consciousness are misleading.

Having brought in the distinction between micro- and macro-consciousness, he (ultimately) claims that micro-consciousness is ubiquitous. According to him, micropsychism – the view that "at least *some* ultimates are intrinsically experience-involving" (2006: 25) – is a limited claim. Strawson further claims that micropsychism leads to panpsychism:

> Micropsychism is not yet panpsychism, for as things stand realistic physicalists can conjecture that only some types of ultimates are intrinsically experiential. But they must allow that panpsychism may be true and the big step has already been taken with micropsychism, the admission that at least some ultimates must be experiential... I think that the idea that some but not all physical ultimates are experiential would look like the idea that some but not all physical ultimates are spatio-temporal.

It seems there are no compelling reasons to accept experientiality as a fundamental unit on par with other fundamental physical facts. This dilemma exists because micropsychism is left by Strawson to be mysterious and inconsistent. First it leaves out 'what it is like' to be micropsychic. We know 'what it is like' in the case of fundamental *physical* properties. There is nothing mysterious about 'what it is like' to be spatial, or 'what it is like' to be qualified or quantified. But there is no way to know 'what it is like' to be micropsychic. To know anything about experience is to undergo that experience. This verification method is implausible with respect to micropsychic properties. If we are unable to understand 'what it is like' in the case of the micro-experiential, then his claim that such experience is concretely real does not hold. The only way to classify the micro-experientials is to place them under the category of *abstract* entities. Abstract reals are not necessarily concrete. And there is no reason to believe that abstract micropsychism could evolve into a concrete macropsychism.

In the Samkhya framework these problems dissolve. First, there is no distinction between micro/macro consciousnesses. The conscious principle, Purusa, is ubiquitous and fundamental. Moreover, Samkhya holds that Purusa does *not evolve*. If consciousness as a fundamental property does not evolve, its presence is static. In other words, there is no evolution possible from micro to macro consciousness. This proposition is based on the assumption that the fundamental properties of the universe do not evolve. Properties such as shape, size, mass, energy etc do not evolve. Similarly if consciousness is a fundamental property it does not evolve and therefore does not undergo any change. Samkhya metaphysics operates within this framework. Evolution takes place *only* at the realm of primordial materiality (Prakrti). Purusa, on the other hand, does not evolve but only facilitates evolution.

I have shown how Samkhya metaphysics is built on panpsychic presuppositions, and offers to reexamine the fundamental structure of reality. It necessitates reworking the current conception of consciousness and experience. Of course, there are inevitable problems in relocating centuries-old theories into a contemporary philosophical framework. Although this remains as a limitation, presuppositions of Samkhya philosophy offer conceptual clarity to various aspects of panpsychism.

CHAPTER 17

The awareness of rock

East-Asian understandings and implications

Graham Parkes

If one were to write a book on the topic of panpsychism in East-Asian thought, it would have to be several times the length of David Skrbina's *Panpsychism in the West*, since most of traditional Chinese and Japanese and Korean philosophy would qualify as panpsychist in nature. For the philosophical schools best known in the west – Chinese Daoism and Neo-Confucianism, and Japanese Buddhism – the world is a dynamic force-field of energies known as *qi* or *busshō* (buddha-nature) and classifiable in Western terms as 'psychophysical.' The topic is vast, but a rough idea can be conveyed through a consideration of the Chinese and Japanese understandings of the phenomena that to Western eyes seem least capable of awareness: namely, rocks and stones.

1. Reverence for stone in China

Examples could be multiplied that would confirm the Chinese as the world's foremost lithophiles or petromaniacs (significant that one has to resort to such neologisms in English).[1] Some might think that such unbridled enthusiasm for stone is evidence of some kind of primitive animism or, more charitably, anthropomorphic projection. But nothing could be farther from the truth – as a brief exposition of the philosophical presuppositions underlying the Chinese passion for rock will show. But first a few historical anecdotes by way of introduction.

A text from around the third century BCE mentions "weird rocks" or "strange stones" being sent as tribute to the mythical emperor Yu, and records of rocks being

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1. Some of the material in the next two sections is drawn from my essay *Thinking like a Stone: Learning from the Zen Rock Garden* (Parkes 2008). I gratefully acknowledge the MIT Press for permission to use it here.

arranged in emperors' parks go back some two thousand years.[2] One of the most famous painters and calligraphers of the Song dynasty (960–1279), the poet Mi Fu, has been proposed with justification as the consummate connoisseur of rocks in the Chinese tradition. On taking up an appointment as a magistrate in Anhui province, a place renowned for the quality of its stone, he is said to have noticed a magnificent rock in a garden of the official precincts. Overwhelmed with admiration, he made obeisance to it and from then on addressed it respectfully as "Elder Brother Rock" every time he passed by. The episode became a favorite theme of painters, who delighted in assimilating the poet's shape and attire to the contours and patterns of the much larger rock.[3] The frequent depictions in painting of the isomorphism between human and stone attest to their enduring affinity in the Chinese tradition.

The emperor who ruled China for the first quarter of the twelfth century, Huizong, was not only a great connoisseur of stone but also the most accomplished painter among the many Chinese emperors who painted as well as reigned. Possessed by a passion for stone that amounted to obsession, Huizong built a huge park near his capital at Kaifeng which he filled with the finest zoomorphic and anthropomorphic rocks that could be found. What fascinates about such stone is the way natural processes mold the apparently least animate form of being into the shapes of more complex forms such as plants, animals, and human beings. But thanks to the Chinese inclination toward correlative thinking, such an isomorphism is to be expected.

At the western entrance to the park Huizong placed a rock some fifteen meters high. A visitor observed at the time: "The rocks on the side had various forms. Some looked like ministers having audience with the Emperor. They were solemn, serious, trembling and full of awe. Some were charging forward as if they had some important advice or argument to present."[4] Here we see the Confucian tradition vitally embodied in the practice of arranging rocks in such a way as to make their interrelations mimetic of social relationships. Huizong gave names to his most spectacularly anthropomorphic rocks and had these inscribed upon them in gold. Although the park was called *Genyue* ('Impregnable Mountain' or 'Mountain of Longevity'), the emperor expended so much of his fortune on it that the extravagance eventually cost him the empire – and all his gardens and rocks along with it.

Stone collecting reached another high point in the late Ming dynasty (1368–1644) and has remained popular ever since. A contemporary account describes the vitalizing effect of a particular stone on one of the era's most famous collectors, Mi Wanzhong, as follows (in Little 1999: 24): "If he was tired, the stone would rouse him; if he was

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2. See Hay (1985: 18); also see Kuck, *The World of the Japanese Garden* (1968).

3. Hay (1985: 32). See also Rambach (1987: 78–79), where there is a reproduction of Mi Fu's *Homage to the Rock* from Wang Gai's *Mustard Seed Garden Manual of Painting*, and Hay (1985: 33–35), for three other paintings of this subject.

4. From the *Record of Hua Yang Palace* by the monk Zi-xui, cited in Keswick (1978: 54).

feeling low, it would cheer him up. As the madness of his passion got worse, he was on the verge of becoming a stone himself."

The case of Mi Wanzhong is emblematic of the contrast between the Western tendency to make a sharp distinction between the animate and inanimate, with rocks falling on the lifeless side of the divide, and the ancient Chinese understanding of all natural phenomena, including humans, as configurations of an energy they call *qi*. Around the fourth or third century BCE, philosophical Daoism set the direction for two millennia of subsequent Chinese thought in understanding the cosmos as a field of *qi* energies. The title of the earliest and best known Daoist text, the *Daodejing* attributed to Laozi and dating from the fourth century BCE, can be translated as 'the classic [*jing*] of the way [*dao*] of powers [*de*].' As Roger Ames has shown in a number of his writings on Daoism, the basic idea is of a patterning field (*dao*) of foci of interpretive energies (*de*), in which each particular focal point can construe the entire field from its own perspective.[5]

A passage in a chapter of the second great Daoist classic, the *Zhuangzi*, reads: "The human being's life is an assembling of *qi*. The assembling is deemed birth, the dispersing is deemed death.... Running through the whole world there is nothing but the one *qi*" (ch. 22). Since breathing is a process that distinguishes the living from the dead, it was natural to think of the breath as a special manifestation of the energy that animates the cosmos, with an active (*yang*) phase corresponding to inhalation and a passive (*yin*) phase corresponding to exhalation. There we have it: birth life death every few moments in the cosmic breath, which moves through and animates "the ten thousand things."

A later Daoist text known as the *Huainanzi* (2nd century BCE) offers a more specific account:

> A shoreline divided the primordial *qi*.
> That which was pure and bright spread out to form Heaven;
> While the heavy and turbid congealed to form Earth. . . .
> The conjoined essences of Heaven and Earth produced *yin* and *yang*.
> The essences of *yin* and *yang* caused the four seasons.
> The scattered essences of the four seasons created all things.[6]

Qi is seen here as the source of all the world's particulars, the variety among them depending on where they lie on the spectrum from the most rarefied ("pure and bright") to the most condensed ("heavy and turbid") forms of energy.

A similar idea seems to have arisen independently in ancient Greek cosmology, and especially in the thought of Anaximenes, for whom "the underlying nature is one

5. See, for example, Ames (1991), though this is a theme that he has developed in several subsequent publications.

6. *Huainanzi* 3:1a:1, in Major (1993: 62).

and infinite and identified as air." In particular he speaks of condensation (*puknotēs*) and rarefaction (*manotēs*) as the two basic transformations of this one "nature."

> It differs in its substantial nature by rarity and density. Being made finer it becomes fire, being made thicker it becomes wind, then cloud, then (when thickened still more) water, then earth, then stones; and the rest come into being from these. (in Kirk & Raven 1963: 144–145)

This characterization of *aer* as the nature powering all things at varying degrees of condensation is remarkably reminiscent of accounts of *qi*. Yet insofar as Chinese philosophy sees transformations of energy as fundamental, it has no place for anything as substantial as the traditional 'four elements' that underlie so much Western thinking about the nature of the cosmos. This difference was for a long time obscured by the practice of talking about the 'five elements' in Chinese cosmology – an infelicitous translation of the Chinese *wuxing*, which literally means 'five goings,' or 'transitions,' 'conducts,' 'doings,' 'processes,' or 'phases (of transformation).'

Corresponding to the 'Six Energies' of Heaven – shade [*yin*] and sunshine [*yang*], wind and rain, dark and light – are the Five Processes associated with Earth: wood, fire, soil, metal, water.[7] Far from referring to static elements that form the building blocks of the world, *wuxing* denotes the five primary phases of transformation through which telluric energies pass in a continuous cycle of self-generation: wood → fire → soil → metal → water → wood, and so on. As a dense form of earth, stone is not to be understood as some kind of matter or substance but rather a phase in this endless cycle of energetic transformations, a slow hard change between the softness of soil and the malleability of metal. An entry on stone from an 18th-century encyclopedia characterizes rocks as follows:

> The essential energy of earth forms rock. . . . Rocks are kernels of energy; the generation of rock from energy is like the body's arterial system producing nails and teeth. . . . The earth has the famous mountains as its support . . . rocks are its bones.[8]

To describe rocks as the bones of the earth seems to the Western reader natural enough, but to appreciate the Chinese reverence for rock one has to concentrate on the characterization of stone as a manifestation of earth's "essential energy." In a work called *Eulogy to the Lodestone*, the fourth century writer Guo Pu marvels at the inscrutable operations of the earth's energies: "Lodestone draws in iron, amber picks up mustard seeds. Energy invisibly passes, cosmic numerology mysteriously matches. Things respond to each other, in ways beyond our knowing" (in Hay 1985: 53). Even if Chinese thinkers as are unable to articulate the precise operations of these energies, they under-

7. These six atmospheric energies are first mentioned in a text from the 4th century BCE known as the *Zuo Commentary* (to the *Annals of Lu*).

8. Cited from *The Classical Contents of the Mirror of Profound Depths* in Hay (1985: 52). The entry on stone is 86 pages long.

stand from experience their considerable efficacy: Guo Pu is revered to this day as one of the founders of that branch of *fengshui* that constitutes a genuine environmental science.[9]

Along with Daoism, Buddhism was another source of panpsychist ways of thinking in China. A significant development took place in the early Tang dynasty (618–907), in which the Mahayana Buddhist extension of the promise of salvation to "all sentient beings," based on the "dependent co-arising" of all things, was taken to its logical conclusion. A philosopher by the name of Jizang wrote of "the attainment of Buddhahood by plants and trees," and a later thinker, Zhanran from the Tiantai School, argued that "even non-sentient beings have Buddha-nature."

> Therefore we may know that the single mind of a single particle of dust comprises the mind-nature of all sentient beings and Buddhas. . . . Therefore, when we speak of all things, why should exception be made in the case of a tiny particle of dust? Why should the substance of "suchness" pertain exclusively to "us" and not to "others"? . . .
>
> Who, then, is "animate" and who "inanimate"? Within the Assembly of the Lotus, all are present without division. In the case of grass, trees, and the soil . . . whether they merely lift their feet or energetically traverse the long path, they will all reach Nirvana.[10]

The Tiantai School was transmitted to Japan (as Tendai Buddhism) by the monk Saichō (767–823), who picked up the line of thinking developed by Zhanran and was the first in Japan to write of "the buddha-nature of trees and rocks," meaning that these so-called insentient beings, being mindful, can be awakened just like the Awakened One (which is what "Buddha" means).

Back in China: with the development of sophisticated rock connoisseurship several types of rock came to be highly prized. The most spectacular kind came from Lake Tai (Tai Hu, also known as 'Grand Lake') near Suzhou and Shanghai, in the heart of literati culture in the south-east. The earliest description we have of a Taihu rock comes from a poem by the Tang poet Bai Juyi.

> Its controlling spirit overpowers the bamboo and trees,
> Its manifested energy dominates the pavilions and terrace.
> From its interior rise quiet whispers,
> Is it the womb of winds? (in Hay 1985: 19–21)

The geology of the Lake Tai area is remarkable in that the rock there is formed from limestone deposits nearly 300 million years old (op. cit., p. 36). These ancient formations were corroded into extravagant shapes when the area was covered by sea, and were then worked and sculpted by the action of hard pebbles in the lake during storms.

9. For a discussion of *fengshui* as practical environmental science see Parkes (2003).

10. See LaFleur (1989), on which the present paragraph is based.

Especially fine specimens of these Taihu rocks – which often look like frozen billows of ocean-spume, or enormous stone fungi burgeoning into the air, or extravagant coral formations poised in an invisible ocean – often stand alone as the centerpieces of famous gardens.

For the Chinese, a special manifestation of the creative workings of nature through the medium of rock is found in the 'stone screens' that have long been a common item of furniture in China. The veining of the marble used for these screens exhibits "traces of mineral combinations of pure limestone and sedimentary layers of clay mixed with organic material or iron oxides which the limestone has recrystallized," all of which produces by way of "natural painting" patterns that look like mist-enshrouded landscapes (Rambach 1987: 26–29). Also known as 'dreamstones' or 'journeying stones,' they have always been avidly collected by scholars and officials for the decoration of their residences, and several different kinds are described in the 12th-century treatise by Du Wan, the *Cloud Forest Catalogue of Rocks*, which is the world's first handbook of rock aesthetics. These dreamstones manifest nature's artistry in depicting a large part of itself (a landscape) in a smaller part of that part (a rock), and such artistry can best be explained by a form of panpsychism that would posit some kind of mimetic capacity between microcosmic and macrocosmic levels of the natural world.

2. Japanese understandings of rock

When the Chinese arts of rock-arranging and garden-making spread to Japan, they found fertile ground in the indigenous religion, Shinto, which has a corresponding reverence for rock and stone. According to Shinto, the whole world is pervaded by awe-inspiring forces known as *kami*. Large and powerfully shaped rocks, as conduits of high intensities of *kami*, were experienced as generating a kind of sacred space around them – an effect that could be enhanced by grouping them together in appropriate ways. Influences from Daoist mythology, Confucian philosophy, and Buddhist philosophy contributed to the development of a unique style of rock garden known as *karesansui* (dry landscape), in which the emphasis was on unworked stone to the exclusion of ponds and vegetation.[11]

Unfortunately none of the dry landscape gardens from the mediaeval period in Japan has survived the ravages of time and war, though one thing that did survive lays claim to being the oldest manual for garden-making in the world. This is the *Sakuteiki* ('Notes on Garden-Making'), attributed to the eleventh-century nobleman Tachibana no Toshitsuna. Even though the text deals with the Heian period pleasure gardens of the nobility with their ponds and streams, a section near the beginning contains the first mention of 'dry landscape' in the literature: "There is also a way to place rocks [create gardens] without ponds or streams. This is called the dry landscape style"

11. For a detailed study of this style of garden, see Parkes (2000).

(Takei & Keane 2001: 161). A look at this classic treatise, about one quarter of which is devoted to the topic of rocks, will help us to appreciate the understanding of stone that underlies the development of the art of garden-making in Japan.

The text's opening words, "*Ishi wo tate*" literally mean "when placing rocks"; but this locution eventually acquired the broader sense of "when making a garden," which demonstrates the centrality of rock-arranging to the development of that art. The primary principle to be observed is exemplified in frequent occurrences of the locution "following the request [of the rock]." They are meant to encourage a responsiveness on the part of the garden-maker to what we might call the 'soul' of the stone: one translator refers in this context to the Japanese term *ishigokoro*, meaning the 'heart,' or 'mind,' of the rock (Shimoyama 1976: ix). Rather than imposing a preconceived design onto the site and the elements to be arranged there, the accomplished garden-maker will be sensitive to what the particular rocks 'want.' If he listens carefully, they will tell him where they best belong.

Readers operating on the Cartesian dichotomy between mind and matter will tend to regard (and perhaps dismiss) much of the content of this text as naïve anthropomorphism; but they would do well to reflect on just how recent and parochial the Cartesian worldview is – no matter how much it has enabled human manipulation of the world by means of technology. By endorsing Cartesian dualism, natural science gave itself permission to deflate the 'world soul' of antiquity, as it were, draining the *anima mundi* and bottling up of all soul within human beings alone. It is only after such operations that any apparent animation of nonhuman phenomena has to be seen as a result of anthropomorphic projection. The parochial nature of this perspective is evident from its contrast with the widespread reverence for rocks in most other parts of the world at almost all times. (The Indian, South American, Australian aboriginal, Polynesian, and Native American traditions come immediately to mind, but respect for stone seems to come naturally for indigenous cultures.)

For those who do not espouse a Cartesian dualism, the term 'panpsychism' is an appropriate name for worldviews that have humans embedded in an unbroken continuum of 'animation' pervading all natural phenomena. At any rate, in order to appreciate the role of rock in the Japanese tradition we do well to suspend methodological prejudices and be open to the possibility that the relationship between the mineral and human realms may be closer than is first apparent. (It's not a matter of claiming that the natural science perspective is false, but rather of affirming the validity of other, ancient perspectives that are nevertheless still experientially accessible to us in the twenty-first century.)

The most important thing is the position of the "Master Rock" – the most powerful in the garden or group – which will then dictate how the other rocks are to be placed. In a section of the *Notes on Garden-Making* entitled "Secret Teachings on Setting Stones," the reader is advised to position first the Master Rock, or Main Stone, and then proceed to "set [the other rocks] in relation to the request of this one stone" (Takei & Keane 2001: 183). The vocabulary of rock-arranging was quite sophisticated by the time this text was written, as evidenced by the large number of terms of art applied to different kinds of stone it contains. They range from the ordinary, such as 'side rock' and 'lying rock,' to the more striking, such as 'master rock,' 'demon rock,' 'Buddhist triad rocks,' and 'rock of vengeful spirits.' This detailed vocabulary surely reflects a heightened sense for stone: where the average person might see just 'a rock,' the medieval makers and appreciators of Japanese gardens see a particular kind with its own unique dynamism, tendencies connected with a vast matrix of other natural phenomena and interrelations. As in the Chinese *qi* cosmology that is behind these Japanese conceptions, the underlying idea is that all phenomena are manifestations of the same cosmic energies, correlated in a multiplicity of different ways that can be understood through appropriate attention and reflection.

A passage containing advice concerning the arrangement of rocks at the foot of hillsides assimilates them to the animal realm: "The stones at the base of a mountain or those of a rolling meadow are like a pack of dogs at rest, wild pigs running chaotically, or calves frolicking with their mothers." The theriomorphism gives way to what we might call personification: "As a rule of thumb, when setting stones, if one pair 'flees' from the group, then seven or eight should 'chase' after them, like children playing tag. The dyad of "running" and "chasing" is followed by several others: "If there are stones that lean, there should be some that lend support; if some proceed, then others should acquiesce; if some face up, then others should face down; and to balance the stones that stand upright, there should also be those that recline" (184–185). Rather than dismissing this kind of talk as betraying a naïve animism, we do better to see it as employing tropes akin to personification in poetry, figurative speech that reflects a rather sophisticated understanding of the relationships between the denizens of what we distinguish as the human, animal, and mineral realms.

One of the most fascinating sections in the *Notes on Garden-Making* is concerned with "taboos" on the placing of rocks, and is full of warnings against violating taboos deriving from *fengshui* practices. But a primary prohibition appears to be grounded more generally in a reluctance (that is not so evident in the Chinese treatises) to infringe upon the stone's naturalness. Placing sideways a rock that was originally vertical, or setting up vertically one that was originally lying, is taboo. If this taboo is violated, the rock will surely turn into a "rock of vengeful spirits" and will bring a kind of curse.

> A stone that is 1.2 to 1.5 meters tall should not be placed in the northeasterly direction. This will become a Phantom Stone [demon rock], and, since it would become a landmark to aid the entry of evil spirits, people will not be able to live there for long. However, if a Buddhist Trinity [Buddhist triad formation] is placed in the southwest, there will be no curse, nor will devils be able to enter. (189)

There is a combination of considerations here drawn from *fengshui* (the north-east as the most inauspicious direction) and Buddhism. It was believed that sometimes simply to transpose a rock from its natural home in the mountains or riverbeds could lead to its turning demonic. The author cites a Song dynasty writer who says that in cases where rocks have ended up in a different orientation as a result of having fallen down the mountainside, these may be positioned in the latter way. "Because the stones have weathered naturally, they can be set or laid in the garden as they were found nature without impediment" (193). Some configurations are to be avoided simply because they resemble the forms of Chinese characters with inauspicious meanings – such as the graph for 'curse,' while others are to be encouraged for the opposite reason – as with a pattern of, three rocks resembling the graph for 'goods' (190–192).

The misfortunes that will beset the master of the house if taboos are violated are various and dire: he may lose the property, the household may be plagued by disease, and the master may lose his wealth, servants, and domestic animals. Even the women of the household will be adversely affected by transgressions in the layout, as when a valley between hills points toward the house. One has to admit that the early development of the practice of *fengshui* in China took advantage of people's susceptibility to superstition, so that a good part of it became tainted with charlatanry and mystification. Yet while some of the discourse on taboos in the *Notes on Garden-Making* seems to stem from mere superstition, we might take such passages not literally but rather as emblematic of a basic and valid *fengshui* principle: namely that to ignore the relationship between the configurations of life-energies that enable human activities and those that inform and shape the environment will diminish those activities and render them less likely to succeed.

At this point a brief autobiographical interlude is unavoidable. What never fails to strike me, when hiking through rocky terrain, are the ways rocks and boulders tend to gather in what look like social groups. In particular, whether nestled in turf or partially submerged in small lakes and ponds, boulders in many different parts of the world seem to have congregated in small groups resembling the so-called nuclear family: two larger rocks as parents, and one, two, or three smaller ones as the children. Rather than being cases of anthropomorphic projection, such impressions of kinship, which always seem charged with significance, present themselves as coming from a deeper realm than the level on which Cartesianism and scientific realism operate. With some distance from the structures of civilization and immersed in more natural surroundings, our experience of the world becomes prereflective and thereby more direct. Depth psychologists would understand the phenomenon in terms of archaism and the quasi mystical 'participation' typical of the (imagined) experience of human beings in far earlier eras.

The point is not to claim that this kind of experience is more valid or true than experience of a world of objects that are totally different in kind from oneself as a subject, but rather that the perspective of modern science is only one among many – effective for certain practical purposes, but not one that much enhances our understanding or appreciation of rocks. Correspondingly, it seems that the perspectives on rock of the Australian aborigine, say, or the medieval Zen master, are still accessible, under the right conditions, to us 21st-century experiencers, and that we would do well to entertain such perspectives as we strive for a fuller understanding of the world. The perceptual and conceptual shifts that allow one to sense such affinities among rocks open up modes of experience that are rich in meaning.

3. Stone as a source of understanding

The sense that so-called inanimate phenomena of nature 'speak' to us is fully confirmed by some of the profoundest philosophers in the Japanese Buddhist tradition, and in particular by the ninth-century Shingon Buddhist thinker Kūkai and the thirteenth-century Zen master Dōgen. Both thinkers discuss the speech and scripture of natural phenomena at a depth that is far from any kind of primitive animism. The Shingon esoteric school was a form of Buddhism that, like Zen, brought the locus of salvation back from some yonder shore and distant time beyond innumerable reincarnations to the present existential situation experienced by "this very body." In several of his writings Kūkai radicalizes Mahayana Buddhist thinking by revisioning the 'Dharmakaya,' which had been previously understood as some formless and timeless Absolute, as the "reality embodiment" of the cosmic Buddha *Mahavairochana* (*Dainichi Nyorai* in Japanese) and nothing other than the physical universe. This means that natural phenomena such as rocks and stones are to be included among sentient beings and revered as constituting the supreme embodiment of the Buddha.

Moreover, with his assertion that "the Dharmakaya expounds the Dharma [Buddhist teachings]," Kûkai claims that the physical world, as the cosmic Buddha's reality embodiment and in the person of Dainichi Nyorai (where the personal is not projected onto the natural world but is there, numinously, all along) proclaims the essential teachings of Buddhism. At a more basic level than where the Patriarchs and Bodhisattvas teach, the world of nature makes manifest the fundamental tenets of Buddhist philosophy. Furthermore, the Buddha Dainichi expounds the Dharma purely "for his own enjoyment" and not for human benefit (there being other embodiments of the Buddha that address human beings directly). So that even though the cosmos may in some indirect sense be 'speaking' to us, it is not doing so in any human language. Speech is for Kūkai one of the 'three mysteries' or 'intimacies' of Dainichi, and so it takes considerable practice for human beings to develop the necessary sensibility for overhearing the discourse and understanding the teachings of natural phenomena.

Almost five centuries later, Dōgen developed similar ideas in the context of the Sōtō Zen tradition. Just as Kūkai identifies the Dharmakaya with the phenomenal world, so Dōgen promotes a similar understanding of natural landscape as the body of the Buddha. In his essay *Voices of the River-Valley, Forms of the Mountain* he urges his readers to hear and read natural landscapes as Buddhist sermons and scriptures, and cites the following poem, which a Chan master in China had authenticated as evidence of its author's enlightenment:

> The voices of the river valley are the Buddha's Wide and Long Tongue,
> The forms of the mountain are nothing other than his Pure Body.
> Throughout the night, eighty-four thousand verses.
> On another day, how can I recount them to others?
>
> (Dōgen 1994–99, vol. 1:86)

Philosophically speaking, Dōgen asserts the nonduality of the world of impermanence and the totality of Buddha-nature. (To say that the totality of existence is 'Buddha-nature' means that all phenomena in their interrelations participate in enlightenment.) Arguing vehemently against the more 'biocentric' standpoint of earlier Buddhism, he claims that Buddha-nature is not restricted to sentient beings, and that "fences, walls, tiles, and pebbles" are also "mind" (1994–99, vol. 3:47). Given that the Japanese term for 'Buddha-nature' (*busshō*) has, like our word 'nature,' connotations of birth and life, it is significant that Dōgen includes human-made artifacts such as fences, walls, and tiles in the realm of the mental – though the Japanese word *shin* (mind), like the Chinese *xin*, means 'heart' as much as 'mind' and thus refers to the mental in the broadest sense.

Furthermore, corresponding to Kūkai's idea of the Dharmakaya's expounding the Buddha Dharma, Dōgen develops the idea that even "insentient beings expound the teachings" – although in a different way from the sentient. To help his listeners or readers understand how insentient beings manage this, he recommends practicing zazen, or 'just sitting,' which gradually takes one beyond the usual anthropocentric understanding of the insentient as utterly 'other' than the human.

It's not only a matter of listening and hearing, but also of seeing and reading. Along with hearing the cosmos as a sermon, one can also see, or read, the natural world as scripture. As Kūkai (1982:31) writes in one of his poems:

> Being painted by brushes of mountains, by ink of oceans,
> Heaven and earth are the bindings of a sutra revealing the truth.

Again it takes practice motivated by a desire for understanding to read this natural text, but the notion of nature as scripture certainly does justice to the sense one often has that there is something 'inscribed' in natural phenomena – and that patterns in stone especially have some kind of meaning. This is perhaps a more muted form of panpsychism than that exemplified by river valleys' giving voice to Buddhist teachings, but it's clear that the inscription is performed by the phenomena themselves (as with the dreamstones) and not by any agent outside or beyond the natural world. The skeptic's charge that this is merely a case of projection might be valid if one claimed to find inscriptions in English or some other human language, but again the point is that we have to do here with natural language in the literal, primordial sense.

Similarly, for Dōgen, the sutras (Buddhist scriptures) are not restricted to writings contained in scrolls, since the natural world too can be read as sacred scripture. This is the message of his essay *Mountains and Waters as Sutras*, where he writes that the words of the eternal Buddha "are engraved on trees and on rocks . . . in fields and in villages" (1994–99, vol. 1:177). In another essay, *Samadhi as Experience of the Self*, he writes that the sutras are "the whole Universe in ten directions, mountains, rivers, and the Earth, grass and trees, self and others" (ibid., vol. 4: 32). Fields and villages (human-made things again), grass and trees, as legible signs – but all in dynamic and differential interaction with everything else (Saussure!). It all issues from the same source, even though that source is by no means singular (as metaphysical sources in Western thought tend to be), but is rather, like the words of the Buddha and the interplay of self and others, radically multiple.

A third Buddhist thinker deserves mention here, the Zen master Musō Soseki (1275–1351), who flourished some three generations after Dōgen. As a renowned garden-maker in the 'dry landscape' style, responsible for two masterpieces in Kyoto (at Saihōji and Tenryūji), Musō was a great advocate of the soteric power of nature as something to be celebrated – as long as one doesn't become attached to it. There is a passage in his best known work, the *Dream Dialogues*, in which he responds to criticism that his emphasis on the natural world makes his philosophy too worldly.

> Those who experience mountains, rivers, the great earth, grasses, trees, and rocks as the self's original part, though they may seem by their love of nature to cling to worldly feelings, it is precisely through this that they show themselves to be mindful of the Way, and they take the phenomena that transform themselves into the four elements as topics of their practice. And when they do this aright, they exemplify perfectly how true followers of the Way love landscape.[12]

Those who surround themselves with a small landscape in the form of a garden gain nourishment from nature because its self-transforming elements are "the self's original part," out of which "all things arise." Through advocating the benefits of communion with the natural world in this way, Musō contributed to the increasing valorization of nature in Zen thinking and practice.

Musō's ideas about the activity of the world's phenomena are very much in line with those of Kūkai and Dōgen:

> All things in the world – grasses and trees, bricks and tile, all creatures, all actions and activities – are nothing but the manifestations of the Buddha Dharma. Therefore it is said that all phenomena in the universe bear the mark of this Dharma.. . . Every single person here is precious in himself, and everything here – plaques, paintings, square eaves and round pillars – every single thing is preaching the Dharma.[13]

When even artifacts are said to be capable of spreading the teachings, one is inclined to ask whether these Japanese Buddhist thinkers would draw the line at such common products in contemporary Japan as plastic water bottles and nuclear waste. Are *all* artifacts through their Buddha-nature expounding the Dharma? In panpsychist terms, are synthetic products sentient in the same way as natural products, things produced by human labor on natural materials, such as leather gloves, or wooden mallets? And if not, does the difference justify a favoring of the latter on aesthetic grounds or for reasons of human flourishing? These are questions that one needs to ponder if panpsychism is to contribute to ecological thinking.

12. Musō Soseki, *Muchū mondō*, in Benl and Hammitzsch (1956: 158–159) (translation slightly modified).

13. Musō Soseki, "Sermon at the Opening of Tenryūji," in Tsunoda (1964: 254).

At the other end of the spectrum from synthetic products are the rocks of the Zen garden, as exemplified by the dry landscape masterpiece at Ryōanji in Kyoto. This garden is a paradigm of landscape – *sansui*, mountains waters, in stone and gravel – as sacred scripture, in which rocks that are now world renowned proclaim the central Buddhist teachings of impermanence and dependent co-arising with considerable power.

The initial impression made by this garden is one of sparse sterility – fifteen rocks (7+5+3) like mountains in a sea of light gray gravel – until one notices the moss that surrounds the bases of several of the rocks. Not much life for a garden, by Western standards, but just enough to point up the stark minerality of everything else within its borders. In summer the bright green of the moss echoes the lush colors of the trees that are visible outside the garden, while in winter its darker greens and mauves match the hues of both the evergreens and the bare branches of the deciduous trees beyond the wall that runs along the garden's south and west sides. Being surrounded by gravel, the moss emphasizes the effect created by the elements of the garden being 'cut off' from the nature outside.

The notion of the 'cut' is an important one in Japanese aesthetics, especially in the figure of 'cut-continuance,'[14] where a cut both separates and joins two things, just as the cinematic cut links two scenes in a film. At Ryōanji the wall cuts the rock garden off from the outside and yet is low enough to permit a view of the surroundings from within. This cut (which is itself doubled by the angled roof that runs along the top of the wall) is most evident in the contrast between movement and stillness. Above and beyond the wall there is nature in movement: branches wave and sway, clouds float by, and the occasional bird flies past. Unless rain or snow is falling, or a stray leaf is blown across, the only movement visible within the garden is shadowed or illusory. In seasons when the sun is low, shadows of branches move slowly across the sea of gravel, accentuating the stillness of the rocks to a point where, even when the moving shadows fade, the rocks themselves seem to be on the move, to be in some sense 'underway.'

The garden is cut off on the near side too, by a border of pebbles (larger, darker, and more rounded than the pieces of gravel) that runs along the east and north edges. There is a striking contrast between the severe rectangularity of the garden's borders and the irregular natural forms of the rocks within them. The expanse of gravel is also cut through by the upthrust of the rocks from below: earth energies peaking in irruptions of stone. Each group of rocks is cut off from the others by the expanse of gravel, and the separation is enhanced by the 'concentric ripples' patterns in the raking that encircle each group (and some individual rocks). And yet the overall effect is to intensify the invisible lines of connection among the rocks, whose interrelations exemplify the fundamental Buddhist insight of 'dependent co-arising,' whereby one sees the dynamic interrelations among all phenomena.

The Zen rock garden is cut off from the surrounding nature with the aim of *drying up* its organic life, which then no longer flourishes and decays in the usual manner.

14. See R. Ōhashi, *Kire: Das Schöne in Japan* (1994).

Karesansui means, literally, 'dried up' or 'withered' 'mountains and waters,' but when Musō Soseki writes the word in the title of his *Ode to the Dry Landscape* he uses a different graph for the *kare* with the meaning 'provisional,' or 'temporary.' Being dried up, the mountains and waters (rocks and gravel) of the garden at Ryōanji at first appear less temporary than their counterparts outside, which manifest the cyclical changes that organic life is heir to. But just as plants look deceptively permanent thanks to their being rooted in the earth, so the rocks of the dry landscape garden, which appear not to change over the decades, give an impression of permanence that is ultimately deceptive. As participants in the "great central life" of the earth (in Thoreau's happy phrase), rocks have a life that unfolds in time sequences that are different from ours, yet which is also subject to the impermanence that characterizes all things.

The philosopher Keiji Nishitani has explained the enigmatic power of the rocks at Ryōanji in terms of their ability to enlighten and teach:

> We are within the garden and are not just spectators, for we have ourselves become part of the actual manifestation of the garden architect's expression of his own enlightenment experience. The garden is my Zen master now, and it is your Zen master too.[15]

This echoes the idea from Dōgen that, while we are seeking a teacher, one may "spring out from the earth" and "make nonsentient beings speak the truth" (1994–99, vol. 1: 94). Just as contemplation of dry landscape gardens can enhance one's understanding of Japanese Buddhism, so a sense for the Japanese Buddhist conception of the expressive powers of so-called inanimate nature can help one better appreciate the role of rock in the gardens that have been inspired by Zen. Contemplation of these rocks can lead to an awareness of what the Zen tradition calls our 'original nature' as humans, which, while apparently fleeting, insubstantial, and ephemeral, may have more rocklike steadfastness to it, at the deepest layers of the self, than is commonly realized in scientific models for mentality.

4. Some consequences and implications

Focusing on the phenomenon of stone within the context of East-Asian panpsychism, we have seen that the Chinese tradition reveres rocks for their age and beauty, for their being expressive of the fundamental energies of the earth on which we live, and for their role in vitalizing human activities. Japanese Buddhism adds pedagogic and soteric dimensions by inviting us to regard rocks (and other natural phenomena) as sources of wisdom, and moreover as companions on the path to profounder awareness. Before considering the implications of these ideas, we might ask whether these East-Asian forms of panpsychism are similar to the standard Western forms, or, if not, what the important differences might be.

15. Keiji Nishitani, as recounted in Carter (1992: 95).

According to the distillation of the essence of panpsychism in the West by David Skrbina, it is important that "objects have experiences *for themselves*," that "the mind-like quality is something internal to or inherent in the object," that "the experience is *singular*," and that "this oneness is reflected in a kind of unitary mental experience" (2005: 16). The East-Asian understanding is quite different, with little emphasis on the internal and 'for itself,' the singular and unitary. It is by contrast non-essentialistic, with 'for others' emphasized, and mind understood as radically relational and external rather than internal and inherent, and therefore multiple and plural. There is "Big Mind," the whole field with its patterning, the structured totality, and lesser minds, particulars as foci within the patterning of the field which construe the totality each from its own particular perspective, and where a sense of the whole through experiential relations with other particulars requires a multiplicity of views and angles. This is the basic idea, from Chinese Daoism to Japanese Buddhism. But why so different, one wonders, from the Western versions?

It is clear that one current of panpsychism in the West does emphasize such features as unity, inherence, and so forth, but perhaps these features come too much from traditional conceptions of philosophy, and the more interesting kinds of panpsychism in the West have different emphases that correspond more closely with East-Asian forms. Or perhaps it's that, of the two Western currents, the one with Heraclitus as its source is closer to the Asian, while the form originated by Parmenides plays out mainly through Platonism. In the Heraclitean stream are the Stoics and Epicureans, and, much later, Nietzsche, whose panpsychism is especially robust. But this is a topic for a different essay, since it's time to conclude, reverting to the East-Asian form and a brief consideration of some of its implications.

One salutary consequence of an awareness of panpsychic kinship with stone and earth is that it obviates any feelings of alienation from the world. If one follows the injunction of Nietzsche's Zarathustra to "stay true to the earth," one can feel fully at home in the world – which is by no means to say that the whole world means us well.[16] The earth is productive enough (without meaning to be so) to sustain an enormous population of human beings, as long as a sufficient proportion of them work the land; but avalanches of rock still injure or kill any humans unfortunate enough to be in the way. Yet whether or not earthquakes have claimed more human lives over time than mining disasters, impartial observers see hubris at work in the practice of mining where respect for telluric forces might be more fitting.

The most important implications of panpsychism in the current world situation are surely for environmental issues and ecological thinking. While Descartes is not here the villain he is often made out to be, there is no doubt that radical Cartesianism, whereby one thinks of oneself as being essentially mind and thus totally other than non-human (mindless) beings, has contributed significantly to the development of

16. See Friedrich Nietzsche, *Thus Spoke Zarathustra*, trans. Graham Parkes (Oxford 2005), Prologue, §3.

those peculiarly Western forms of technology that are designed to control and exploit all other beings for human benefit. Such a Cartesian view also provides moral sanction for such exploitation, since if other beings are essentially different in kind from humans, this precludes the possibility of any moral responsibility toward them.

One reason why, by contrast, the natural sciences in China, in spite of their high level of sophistication, did not assist the development of such exploitative technologies, is probably that they remained – thanks to their basis in *qi* cosmology – panpsychist in outlook. If the ancient Chinese were nevertheless pretty successful in ravaging their environment, this was in part due to the internecine warfare that plagued the country for so many centuries. And when in the modern period Mao Zedong declared war against nature, in the name of making the nation strong, he was explicitly pitting himself against scientists who adhered to more traditional Chinese understandings of the natural world.[17]

Insofar as panpsychism understands humans and other beings as being interrelated by virtue of participating in a continuum of degrees of awareness, it tends to promote a respect for other forms of life and existence. The strength of this tendency would depend in part on whether the panpsychism is subscribed to only in theory, as an intellectual commitment, or whether it's experientially based as a result of some kind of (somatic) practice like Daoist or Buddhist meditation. In the former case a gap between belief and actions, good intentions and failed practice, is likely to open up. One might be a practicing Christian, for example, who believes that the natural world as God's creation is worthy of respect, and yet if there's an opportunity for vast financial gain through ruthless exploitation of natural resources, that belief may easily be relegated to the back of one's mind for the time being. On the other hand, if one follows a thinker like Dōgen and engages in the practice of sitting zazen, one gradually comes to experience a mental or psychical kinship with other beings; and as this experience becomes incorporated, one's activities are naturally transformed thereby. Here we have the Buddhist idea of the intimate link between the twin virtues 'insight and compassion': as one comes to realize one's interrelations with others, selfishness is correspondingly reduced, and increasing compassion is a natural consequence.

Because of our usual preconceptions concerning rocks, we not only regard them but also experience them as being more distantly related to us (if related at all) than plants or animals. They are thus an especially challenging form of 'other' with respect to the task of developing compassion. But if we shift our conceptions, and direct our attention to the rocks in an exemplary East-Asian garden, we find that our perceptions of them will shift as well. Then we may even begin to hear them proclaim the tenets of panpsychism, or to see them as texts that attest to the pervasiveness of psychical significance.

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17. See the account in Dai Qing, *The River Dragon Has Come!* (1998), pp. 151–153. Also the more general discussion in Judith Shapiro, *Mao's War against Nature* (2001).

CHAPTER 18

Why has the West failed to embrace panpsychism?

Freya Mathews

When I was invited to write this chapter, I thought I would summarize, and hopefully extend somewhat, my main arguments-to-date for panpsychism. I do have something of a store of such arguments, for I have been developing a philosophy of nature along panpsychist lines, basically in the context of environmental philosophy, for the last twenty years. (I would call it a *naturphilosophie*, if that term were not so encumbered with historical disdain.) Moreover, I have spent my entire philosophical life proclaiming, to anyone who might be listening, the need for metaphysics generally (Mathews 2008b). I have been an ardent defender of metaphysics against the historical and contemporary onslaughts that have for two centuries almost stymied metaphysical inquiry in favor of explorations of logic, truth and language or, more recently, in deference to phenomenological and postmodern scruples about ontology. Now that metaphysics is back on the academic agenda, and even panpsychism is obtaining a small following, thanks to challenges posed by contemporary philosophy of consciousness, I could have welcomed the opportunity to try out my metaphysical arguments on a wider circle.

At just this moment however I find myself, not exactly having doubts, but undergoing a certain re-orientation towards the project of metaphysics. This is a result, not of being persuaded at last by Western critiques, from Kant to A. J. Ayer to Rorty, but rather of a pervasive though gradual transformation of consciousness accruing from my long-time engagement with Chinese thought. Under this influence I find that questions about truth are becoming important for me after all, though not in the way they were for Kantians or for philosophers of language and logic. From the Chinese perspective, truth can no longer be seen as the taken-for-granted goal, and theory the taken-for-granted vehicle, of cognition. Yet truth and theory are indeed the taken-for-granted presuppositions of the project of metaphysics. Questioning these presuppositions turns out to have implications not only for the project of metaphysics generally, but for panpsychism specifically: such questioning throws light, I think, on why panpsychism, though recurrently surfacing in Western thought (Skrbina 2005), has nevertheless invariably so far failed to take root in the Western philosophical imagination. So, rather than detailing metaphysical arguments for panpsychism, as I originally intended, I have opted instead to use the present chapter to examine obstacles to panpsychist thinking that I take to be endemic to the Western philosophical project.[1] After all, if the world really is invested with mental or psychic presence, as panpsychism avers, why have we in the West so resolutely turned our backs on it? How can we have continued to be so blind?

1. *Theoria*: The perspective of the West

In order to identify obstacles to panpsychist thinking, we need to go back to the beginning – where for us in the West this means, of course, going back to the Greeks, to the origins of philosophy.

All human societies ponder fundamental existential questions – why are things as they are, how did the world originate, what is the place of human beings in the greater scheme, and such like – but the Greeks are generally taken to have been the first to separate out a secular approach to these questions from the usual mythopoetic approach. So, amongst the pre-Socratic philosophers for instance, Thales suggested that everything is really made of water: beneath the flux and diversity of appearance there lies a kind of unity, an order, a uniformity or universality of process. Anaximenes construed this underlying, unifying substratum as air, and Anaximander went one step further in the direction of abstraction and rendered it a boundless substance, *apeiron*, without specific empirical characteristics (and in this respect unlike water or air) but nevertheless regulated by a principle of 'justice' that ensured that each element of reality would play its allotted role and then give way to its contrary.[2]

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1. For readers who may nevertheless be interested in the *naturphilosophie* that has been taking shape through my various books and papers, I include here a little summary. My main arguments for panpsychism appear in my 1991 book, *The Ecological Self* and my 2003 book, *For Love of Matter: Towards a Contemporary Panpsychism*. The arguments developed in *For Love of Matter* rest on and presuppose foundations developed in *The Ecological Self*, and the two books really need to be read in conjunction. In *For Love of Matter*, the manifest world, as described by physics, is represented as the outward appearance of an inner field of 'subjectivity,' in an expanded sense of subjectivity. Reality is, from this point of view, both a unity and a manifold of differentia, a One and a Many. Viewed from within, it is a field of subjectivity, with a conativity (that is to say, a will to realize itself and increase its own existence) of its own and a capacity for communication; from the viewpoint of its finite modes, or those of them that are capable of acting as observers, it is an order of extension, as represented by physics. As a locus of subjectivity and conativity in its own right, the universe is capable of and actively seeks communicative engagement with its finite modes, the Many, or, again, with those of them that are capable of such engagement. Wherever this communicative engagement is actualized, it is manifest in a *communicative* order that unfolds alongside the *causal* order. This communicative order, or order of meaning, exceeds the causal order but in no way contradicts it.

2. See R. McKirahan, "Presocratic philosophy." In C. Shields (ed.), *Blackwell Guide to Ancient Philosophy* (2003; Oxford: Blackwell).

Underlying and structuring this secular approach was a new and sophisticated notion of *truth* – a notion that there is, in addition to the world itself, the *truth* about the world, a truth that we as knowers can discover. The seeker after truth engages in a particular mental or cognitive operation: he holds a mirror up to the world; he duplicates the world mentally, and when he finds in that mental double a picture which he regards as accurately reflecting the nature of things, he has found truth. The truth about reality, or some aspect of reality, is permanent. It is in fact eternal: the world changes, but the truth about the world does not change. Things arise and pass away, moment by moment, but the truth about things is timeless. The goal of thought is to grasp truth, and the grasping of truth is an end in itself, a form of epistemological satisfaction peculiar to the intellect, where intellect itself comes into existence with the advent of this kind of epistemological activity.[3]

Such a notion of truth had not crystallized in other ancient societies in quite the same way as it did amongst the Greeks. In other ancient societies thinking was still inextricable from agency: humans thought in order to act in some way. Apprehending the world, via animistic stories, was inseparable from invoking its divinity or tapping into its agency. In thinking and knowing in these old ways one remained, first and foremost, an agent within the world negotiating one's way around it, rather than a spectator, a looker in an inner mirror that reflected reality. For the Greeks however, approaching the world through this mental operation of doubling, of reproducing the world in this inner mirror, reality appeared under a peculiar disembodied, untouchable, abstract aspect, reflective of what-is but inert, unable to act upon the observer or be acted upon by them. While this inertness of the ideal duplicate of reality that was the object of knowledge was not accomplished all at once, and traces of the older mythopoetic animisms lingered in the philosophizing of the pre-Socratics, it did become dramatically explicit in Plato, in the shape of the Theory of Forms. The Forms were the abstract, eternal, perfect and unchanging images to which any actual, concrete, perishable world must conform. The goal of thought was to access this abstract realm and apprehend reality under a timeless rather than an ever-changing aspect.

Although the Theory of Forms seems a little bizarre or metaphysically florid to us today, Plato was really, in positing the Forms, no more than making explicit the ontological implication of the Greek discovery of truth. This reification of thought, this extraction, from fallible and temporal experience, of abstract and eternal mirror images of the world which then became the proper objects of the epistemological quest, resonates down through the Western tradition. It is the origin of *theory*: in projecting a mental reflection or *re*-presentation or idealized picture of the world onto a kind of abstract screen in an inner *theatre*, the mind is constituting theory. These mental processes have left their trace in etymology: the word, 'theory,' is derived from the Greek, *theoria*, a looking at, thing looked at; *theoros*, spectator; and *thea*, spectacle.

3. See B. Snell, *The Discovery of the Mind: The Greek Origins of European Thought* (1953/1982; New York: Dover).

Achieving such an ideal re-presentation or doubling of the world constituted the act of knowledge. Moreover, in making knowledge its goal, the human mind subtly removed itself from reality and became reality's spectator, an observer of the drama – an observer invisible from within the constructed drama itself and in this sense invested with a status different from the elements of that drama, the elements of a re-presented reality. The drama itself, the spectacle, was constructed via extrapolation from and idealization of experience. The mind constructed a map or model that was intended to reflect the immediate world of experience but also to complete it. This map or model – *theoria* – was both pictorial, in that it conveyed an image of the world, and propositional, in that it abstracted from the unfinished and immediate particularity of things in favor of a completed totality, a totality which nevertheless, as something created by the knower, could not include the knower amongst its contents.

This knower who could not be included in its own ideal re-presentation of reality was, I would suggest, the original *subject*, and the world as ideal projection, or re-presentation in the theatre of the subject's mind, the original *object*. It was, in other words, via the subtle reification involved in *theoria*, the introjective act of contemplative knowing, that the world first became an *object* for the human mind, inert and untouchable and completely devoid of real presence or agency of its own. This separation of active, world-constructing *subject* from the merely acted-upon, constructed *object*, was, I would further venture to suggest, the origin of the famous *dualism* that has systematically inflected Western thought. This dualism is a function of the subject-object bifurcation that inevitably occurs as a result of the mental operations involved in that form of knowing that I am here calling theory or *theoria*. Qua active knower, the subject is categorically different from the mere after-image of the world that it projects onto its mental screen, and as a result it inevitably feels the sense of apartness from, and aloofness to, the world that we witness in the history of dualism. Indeed there is a built-in autism, or radical self-centrism, in the standpoint of the subject, in the sense that the subject is developmentally disposed to fail to recognize, in any deeply felt way, the subjectivity of re-presented others. This will make self-other relations problematic even at the most immediate personal level. It will effectively block an outlook, such as panpsychism, which attributes subjectivity to the world at large.

Much further down the track, when the initial objectification of reality for purely explanatory purposes had led to a more accurate, detailed and comprehensive form of theorization – the body of knowledge known to us as science – humanity would be enabled to exercise its agency, which had initially been bracketed in the search for truth, on an unprecedented scale. But this was a new form of agency, the agency of a subject no longer negotiating the world from a standpoint of immersion within it but objectifying it in the 'mirror' of *theoria*, then reflexively premeditating and rehearsing action before carrying it out in actuality. This calculated form of agency turned out to entrain undreamed-of efficacy, and this efficacy, combined with the autistic tendency of dualism, has in time enabled the wholesale transformation – and degradation – of nature in the service of human ends.

Although the consequences of *theoria* have thus been in certain crucial respects sad and sorry, the developmental significance of this epistemic break-through was of course inestimable for human consciousness. For *theoria* brought with it not merely a powerful new way of organizing experience, by re-presenting it, but also a powerful new way of explaining what was re-presented. It is for this reason that theoretical knowledge serves a contemplative purpose: it purports to tell us not merely *that* the world is so, but *why* it is so. Even to wonder why the world is so is to embark on a course that is richly generative of meaning and therefore of culture. The significance of this question for opening up the Greek mind can hardly be underestimated. But we can also note that the *structure* of explanation in Greek thought followed a particular pattern. This was the pattern of *inference from universal to particular*. This pattern is discernible in the proto-theories of the pre-Socratics: reality was re-presented by them in terms of specific universal principles or essences: water in Thales' case, air in Anaximenes', the *apeiron* governed by a principle of justice in Anaximander's, the ungenerated, indestructible, unchanging, indivisible and eternal plenum in the case of Parmenides, and atoms and void in the case of Democritus. In all these cases, a universal, law-like and unified somewhat is posited to underlie the flux of empirical particulars and the behavior of empirical particulars is understood in terms of it.

This pattern of explanation – involving inference from universal to particular – seems natural and obvious to us in the West, but this is because it informs the whole structure of thought that we have inherited. On closer inspection it actually turns out to be rather odd. How are we supposed to discover the kinds of universals on which such explanation depends, given that we never have access to the whole of reality? The 'completed totality' that *theoria* requires turns out to be unavoidably speculative. And even if we could truly discover such universals, why should we find them explanatory, since they are themselves generally contingent.

Consider, for instance, Newton's laws of motion. If we are given Newton's second law then we can indeed predict that a billiard ball will accelerate in proportion to the strength of the force applied to it, but if we have no idea why force and mass and acceleration are related in the way the law describes, we will not really understand why the ball behaves as it does. In other words, since this model of explanation leaves universals themselves unexplained, it ultimately begs the explanatory question. The illusion of explanatory power that attaches to this structure of inference from universal to particular emanates not from ontology but from logic, and reflects the fact that 'the world,' as it is re-presented in *theoria*, is organized not by innate ontological necessity but by the rules that govern propositions. These are rules of predication, consistency and inference, first and foremost inference from universal to particular. So the structure of *theoria* subtly follows the structure of mental doubling or re-presentation via the mirror of picture-propositions; in conformity with this, *theoria* orders these picture-propositions in accordance with the laws apposite to them, namely, the laws of logic, rather than discerning in reality itself the contours of any innate ontological necessity. In this way the world takes on the aspect of a *rational* order: in characterizing it as rational however we are in fact identifying the logical structure of the mental mirror rather than the structure of the world itself.

In the evolution of Western thought from the time of the Greeks, this *theoretical* model of intelligibility prevails: intelligibility is assumed to reside in a set of universals from which the behavior or form of particulars may be inferred. The universals may be pre-Socratic substrates or Aristotelian essences, which fix the form of instances in advance, or they may be the kinds of 'laws of nature' postulated by the mechanical science of the 17th century – or indeed by the post-classical science of the 21st century. Aristotelian essences could indeed lay claim to a certain kind of necessity, but this was generally necessity of the 'opium induces sleep by virtue of its soporific power,' tautological kind. After more than fifteen hundred years of this kind of 'explanation,' thinkers were understandably impatient, and when the grip of medieval Christian dogma (which had subsumed Aristotelian teleology under theology) loosened somewhat at the time of the Renaissance, thinkers started to look for a more empirical kind of universality in nature, and found it in the laws of motion finally established by Newton. Here were universals of a genuinely substantive – non-tautological – kind. However, the problem of *guaranteeing* their universality – and hence the explanatory power of the new science as a whole – remained. Their universality could not be established by observation, since the universe as a whole vastly exceeds the reach of our observational capacity, both in space and in time. Even if we discounted our limitations as observers, these 'laws' would still be patently contingent: enormous experimental ingenuity is required to discover them in the first place, and once discovered, we can see no reason why they have to be as they are. The proportions of mass to force to velocity and so on seem arbitrary. They could apparently be otherwise. Certainly they are not self-evident. So the riddle of explanation – of *why* things are as they are – remains.

To solve this problem of contingency or arbitrariness, and hence this failure of intelligibility, at the heart of science, the postulate of causality was tacitly assumed. The universals of science were underpinned by *causal* necessity. The forces posited by physics were vectors of a causal power that simply *made* things that were otherwise entirely arbitrary happen. Physics was a theater of *force*, of coercion, because otherwise there was no way of accounting for the fact that things happened as they did. But Hume of course exploded this device, by revealing that the principle of causation is neither logically necessary nor detectable by observation. The whole edifice of science is held in place by it but it is, in fact, a metaphysical fraud or sleight of hand. Kant famously 'resolved' this epistemological scandal by acknowledging the 'transcendental' status of causation; that is, although the postulate of causation is not anchored in reality, it is required for explanation, and hence is part of the organizational structure of the mind itself. Kant's recognition of this transcendental status of causation led him to assert the transcendental status of explanation generally: it is via the innately mind-imposed or mind-constructed categories of thought that raw experience is organized into a comprehensible order, but this order remains a mental construct; it tells us nothing directly about reality as it is in itself. In light of the present conjecture regarding the origins of theoretical thought in the mental operation of re-presentation, with its bifurcation of consciousness into subject and object, however, we might perhaps view Kant's 'transcendental structure of thought' as the transcendental structure of *theoria*. That is to say, we might see Kant's inventory of the categories and the forms of intuition (in his special, technical sense of these terms), together with his analysis of the 'transcendental unity of apperception,' as a very precise dissection of the mental operations whereby mind constructs the idealized mirror of reality that constitutes *theoria*. There may be alternative modes of thought, and indeed of explanation, which do not share this structure – the structure of *theoria* – and do enable us to see both how and why reality itself hangs together.

Before introducing an example of such a mode of thought, I would like to spell out in a little more detail how the conundrum of causation at the heart of science is a consequence, at a subtler level, of the mirroring maneuver at the base of theory. In this mirroring maneuver the mind, as we have seen, projects 'the world' as an idealized totality onto a kind of mental screen and in the process differentiates itself, in just the kind of way Kant detailed in his analysis of the transcendental unity of apperception, into a knowing subject, on the one hand, and the world as object or known, on the other. Since this object is, despite its world-content, mentally a passive construct of the subject, it will be understood by the subject to be, in an ultimate sense, inert. In the explanatory scenario of *theoria*, self-activity, and hence motive power, will always be intuited to lie outside the object. The object by definition, qua object, lacks the power of self-creation or self-animation. It will for this reason seem intuitively natural, from the perspective of the subject, to posit an external source of motive power for the world, a Prime Mover or, as secular substitute for such a Mover in science, a principle of causation, which is, as we have seen, a principle of coercion or force. The laws of nature are held in place by the arbitrary but coercive force of causation.

So, to continue the recapitulation, science, the ultimate expression (so far) of *theoria*, is inevitably a physicalism or materialism. In its re-presentations, *theoria* is faithful to the subject/object bifurcation on which it rests: it portrays the world as an inert realm of object-nature, which is best figured as a manifold of object-stuff in object-space, where the stuff partakes of object-nature in the sense that it is devoid of subjectivity and its correlates, the power of self-movement, self-activation, self-structuration, self-increase. Lacking the motive-power that resides in subjectivity, this object-world has to be activated by an external agency (Prime Mover or principle of causation), where such an agency is proxy for the 'transcendental' subject who originally constructs the object.

Clearly then, *theoria* is deeply and subtly biased towards accounts of the world that reflect its own bifurcated or dualist origins: either materialist/physicalist accounts like those of science which render the world a fully externalised object, or omnipotent forms of idealism, like Kant's, which acknowledge the merely constructed and hence ideal status of 'the world.' In this sense, *theoria* is deeply antipathetic to accounts which attribute subject-nature to the world considered both real in its own right (not merely a mental construct) and knowable. In other words, since panpsychism has precisely such a realist orientation and ascribes subject-nature to the world, *theoria* is an inimical vehicle for panpsychism. This is not to say that panpsychism cannot be theorized. It manifestly can, and often has been, historically and in the present, as the present book attests. It is rather to say that panpsychism cuts against the transcendental experience, so to speak, from which *theoria* arises, the mental experience of subject/object bifurcation. For the subject born of this bifurcation – the subject engaged in *theoria* – some form of either physicalism or idealism will remain its natural and plausible metaphysical default position.

2. The strategic perspective

It was a brilliant and arresting article by Francois Jullien (2002), "Did philosophers have to become fixated on Truth?", that first sensitized me to the possible contingency of truth as the goal of cognition. And it was the meta-level contrast Jullien drew between the figure of the Greek philosopher and that of the Chinese sage that somehow made this contingency of truth as a goal plain. Jullien's arguments were different from those I have offered here; he did not posit *theoria* as a distinct category of cognitive process nor did he, accordingly, seek to demonstrate that dualism originated in such a process. But his aim was, like mine, to show that truth, the goal of the Greek philosopher, was an historical and cultural discovery. In seeking truth, the Greek philosopher was seeking a kind of final solution to the riddle of existence, an account of the nature of things that was fixed and eternal despite the perishability of things themselves. Truth in this sense, Jullien emphasized, was exclusive: if a view were true it necessarily excluded all competing views. It was in this respect that the Greek philosopher stood in marked contrast to the Chinese sage, who, Jullien observed, set out not to *explain* the world but to *adapt himself to it*. The sage sought to identify the tendencies or dispositions at work in particular situations in order to harness those tendencies or dispositions to his own best advantage. To this end he remained open to all points of view instead of insisting on a single viewpoint ('truth') exclusive of others. In describing the sage as seeking 'congruence' with reality, Jullien seems to be implying that the thinking of the sage remained inextricable from agency rather than becoming, like the thinking of the Greeks, an end in itself.

The contrast between the Greek and the Chinese approaches to cognition is instructive, for as I remarked earlier, it can be difficult for us as Westerners to imagine alternatives to the founding presuppositions of our own modes of cognition. Yet, as I have already intimated and shall argue further in due course, it may be these founding presuppositions that are shaping the project of metaphysics in such a way that it subtly and systematically renders the idea of panpsychism untenable. For this reason I want to develop the contrast between Greek/Western and Chinese approaches further, and show that the Chinese approach, characterized by Jullien as "accommodation," is part of a very different project from that of *theoria*, and yet leads ultimately to its own model of explanation, one that is much more conducive than the Western model to an outlook that could be described as panpsychist. (The Chinese themselves wouldn't describe it as panpsychist however because such metaphysical categories are not, as we shall see, their terms of reference.) In speaking about 'the Greek' and 'the Chinese' approaches, I am of course constructing these as ideal-types, with some degree of historical purchase, at a very general level, but without any pretension of doing justice to the great variability of Greek and Chinese thought in actuality. The purpose is merely to highlight defining characteristics of *theoria*, and to conceive of alternatives to it.

The project which I am here attributing to the Chinese, and to which Jullien's art of accommodation belongs, is, I would suggest, a *strategic* project. Where the Greek approach could be described in terms of *theoria*, the Chinese approach could be described in terms of *strategy*. As strategists, we are concerned, not, like the theorist, with the world as a completed totality projected by the subject onto an ideal screen, where that totality is then perceived as external to and independent of the subject; we are concerned rather with the immediate field of influences in which we are immersed and the way in which that field impacts upon our agency. That is, we are concerned not with an idealized 'world,' conceived under its universal aspect, but rather with our own immediate situation and how the influences at play in it are impinging on us, corporeally and tangibly, in the present moment. Our focus has shifted from the world as an inner but nevertheless external-to-the-subject object of observation to the immediate field of active influences in which we are agentically immersed. We do not need a theory about the nature of reality in order to respond strategically to this field: we can feel the environmental pressure increasing and decreasing as we respond now this way, now that. There is no sense of this world as a completed totality; it extends just as far as the range of our own sensitivity, and as we move around in it this range is constantly changing. To train the strategic faculty, one does not teach reason, which is to say, the rules of logic and abstraction, but rather one sets exercises or practices which cultivate sensitivity and responsiveness. This is why Chinese sages typically received their training in martial and other Daoist arts rather than in discursive inquiry.

Strategic consciousness then, unlike discursive consciousness, is inherently nondualist, not because it is unself-consciousness but because it doesn't project 'the world' into an abstract space of re-presentation beyond the agency of the self, where it can be grasped as a bounded totality. Rather, the strategic self remains immersed in a fluxing field of immediate pressures which are registered not 'objectively,' as part of a totality at an epistemic remove from the subject, but in terms of their immediate impact or influence on the agency of the self. Etymology is helpful here, as it was in the case of the term 'theory': 'strategy' is derived from the Greek *strategia*, 'office or command or art of a general,' from *stratos*, 'multitude, army, expedition' and *agein*, 'to lead, guide, drive, carry off,' from Sanskrit *ajirah*, 'moving, active.' In light of this, strategy may be understood as concerned with the coordination of collective or individual agency. Cognition is required for such coodination, but this is not the kind of cognition involved in *theoria*, which abstracts from the empirical agency of the subject in order to attain a more 'objective' rendering of the world. In *strategia*, cognition remains in the service of agency.

However – and this is the important point – it is not as though the sage, by staking out his epistemological standpoint within the terrain of his own agency and cultivating sensitivity to the immediate and particular influences impinging on him, does not discover anything about the nature of reality. What he discovers is that *strategia* calls for accommodation. The best way of negotiating the field of influences and conativities in which one is immersed is generally to adapt to them, which is to say, to make one's own ends as consistent as possible with them, rather than seeking to force those influences and conativities into compliance with one's own will. This is self-evident inasmuch as he who achieves his goals in ways best calculated to conserve his own energy will be most fit to continue to preserve and increase his own existence. *Strategia* then points to *wu wei*, the way of least resistance, which can be understood not simply as the giving up of one's own ends in deference to the ends of others but rather as tailoring one's ends to those already in train in one's environment, and using the energies already at play therein to further one's own goals.

The sage discovers the wisdom of *wu wei* not, as we have seen, through the ideal objectification of nature, as in science, but through strategic trial and error, with his own agency as the terrain of experimentation. By cultivating his sensitivity to immediate environmental signals, and responding to them now one way, now another, he learns that generally he does best when he does least. He learns that if one can yield to pressure without being harmed, it is best to yield, rather than to resist or try to overcome. If one can use the energy, including the energy of ambient conativity, already available in one's environment to attain one's goals, it is, again, best to use that energy, rather than drawing on one's own. The less energy of one's own one uses, the less one will deplete one's own resources; the less depleted one is, the greater one's fitness. If one cannot yield, or harness ambient energies, without being harmed or diminished, then one might have to fight or contend – one might have to draw upon one's own resources and exert oneself strenuously. But even then (indeed particularly then), principles of *wu wei* will apply to the methods one adopts for fighting or contending.

In discovering this strategic principle, the sage is not of course discovering something that applies uniquely to himself. Having discovered it he can simply *see* that it must apply generally, other things being equal, to everything in nature, since things are by and large naturally or necessarily selected according to fitness. This way of least resistance, or *wu wei*, is in fact the Way, the Dao, which, unlike the arbitrary universals of the pre-Socratics or indeed of modern science, is a self-evident ontological necessity, built into the fabric of being. So, starting only with the strategic imperatives of his own being – the motive power of his own conativity on the one hand and the efficacy of least resistance on the other – the sage discovers, incidentally as it were, the Way of all nature.

But this is not all. For the strategic approach not only reveals the Way of reality; it also yields, incidentally in effect, a particular model of explanation. This is a model of explanation that delivers intelligibility in a way that the theoretical-causal model failed to do; that is, it delivers not the illusory intelligibility of inference from contingent universal to particular, but the genuine intelligibility of self-evidence. Here is how it works.

As strategic agents we are, firstly, imbued with a conative imperative, the imperative to preserve and increase our own existence. (This is Spinoza's definition of conatus, and it is not accidental that it figures here, as we shall see below.) We learn, through strategic experimentation, that the optimal way of preserving and increasing our existence is the way of least resistance, of *wu wei*, adapting our ends to those of others in our immediate environment and harnessing processes already under way to achieve our ends. This may mean free-riding on winds, rains, solar radiation and natural geometries and topographies, for instance. But it might also mean more subtle strategies, shaping ourselves to our environment in ways that involve a reciprocal effect.

Through cultivating our sensitivity to the conativities already acting in our environment, we can engage those conativities, joining them with our own to create new ends which transcend the ends of each of the participants, including ourselves, but which nevertheless remain true to each participant's conative dispositions. I have elsewhere called this engagement of conativities, by which new and larger forms, continuous with the existing conative dispositions of the participants, come into being, *synergy*. Through synergies, in this sense, new form, new possibility, is continuously brought into the world, without the need for one party to impose itself on, or violate the conativity of, another. New form is continuously generated out of the conative energy of that which already exists. In the biological realm this principle of synergy is expressed as reproduction, and its essentially creative function is identified as fertility. But the scope of this principle – of synergy, in the present sense – is wider than this. It points to a basic onto-structural necessity: things are optimally preserved to the extent that they fit with their environment and allow the energies of their environment to carry them to conatively appropriate goals. The sage, cultivating sensitivity to the field of influences and conativities in which he is immersed and experimenting with strategic possibilities, learns not only how to fit into the world himself, but how everything fits together creatively in nature.

It is this fitting together that provides the key to explanation, to the intelligibility of things. When he wants to know why a thing is as it is, he looks, not for some arbitrary 'law of nature' from which it might be inferred, but for the way the thing in question has been shaped by and with other things in its immediate environment. He looks at a pea and sees how it has been shaped by the contours of the pod. He looks at the honey-eater's beak and sees how it has adapted itself to the flower's throat. He looks at the Blue Whale and sees how its form is dictated by the great baleen structures that have been shaped to sieve the waters for krill. He sees a jigsaw world, everything shaped by and shaping everything else, an Escher world of birds contoured exactly to fish, fish to other fish, fish to waves, waves to rocks, rocks to other rocks... The sage needs no *theory* to understand why things are as they are in such a world; once he understands the way things are shaped by and shape the things around them, he can see why they have to be so.

How different this piecing-it-together, or as I shall term it, *con-formational*, way of looking at the world is from the way of science! It makes no assumptions about a 'fundamental level' from which phenomena observable by us are built up, in accordance with arbitrary but universal laws. It does not even posit fundaments. It looks instead for instances of mutual morphology or mutual functionality amongst the appearances, just as these appearances are given in perception. From these clues it seeks to piece together the jigsaw of a larger pattern. Starting from the phenomenal in this way, and with the pieces of the jigsaw that are nearest to hand, it doesn't assert, at the outset, metaphysical categories such as 'mind' and 'matter'. Notions such as these pertain to the 'fundamental level,' to which the strategic approach, with its interest in conformation, has no recourse. Rather, it is taken for granted from the strategic perspective that human consciousness, like everything else, seeks self-expression and receives its particular shape, or function, from internal relations with other elements of a larger pattern. The terms of reference required to describe the larger pattern will therefore have to be as encompassing of the 'psycho-' as of the 'physico-'. Not that the Chinese would put it this way. From their viewpoint, this great fitting-together of things cannot be anticipated by preconceived and fixed metaphysical categories: the Dao cannot be named. It is not a law, a specifiable universal. This is not because it is a mystical somewhat beyond our ken, but rather because it is merely a continuity of unfolding, whose outcome cannot be prefigured, though the principles for strategically negotiating it can be discovered.

Let me expand on this latter point a little. As I have already explained, the strategic principle of *wu wei*, disclosed in the very person of the sage himself, does give a clue to the dynamic of this unfolding: it is a flow-dynamic of conative striving for self-existence and self-expression on the one hand, and of accommodation or least resistance on the other, where least resistance also expresses itself through the highly creative processes of synergy. Although there are no predetermining universals assumed to be at work in this scenario, the sage can still seek to explain why things are as they are in any particular instance. He will do so by discovering the pattern whereby the things in question fit together in that instance. If the pattern happens to include a pattern of meaning – if the things in question seem to fit together in a synchronistic or poetic or other meaningful way, and not merely in morphological or functional ways – then meaning will figure as part of the pattern. In other words, there is no hard and fast distinction made at the outset between organization according to meaning and organization according to physical structure. It is, to adapt Gregory Bateson's famous dictum, 'the pattern that explains,' and the pattern is metaphysically neutral with respect to Western categories, such as mind and matter. Viewed from this perspective, we can see how heavy-handed and reductive are terms such as 'materialism'/'physicalism' and 'panpsychism,' although we can also see that the conformational perspective, with its open-ness to the psycho- as much as the physico- in its search for pattern, is far more aligned with psychophysical outlooks than it is with any kind of physicalism or materialism.

This affinity between the conformational perspective and what we in the West might call a panpsychist or psychophysical outlook is reinforced when we consider that the whole tenor of reality as revealed through the strategic experience is far more mind-like than is any view of the world obtainable through science. When we experience reality, Escher-style, as a field of internal relations, everything fitting together, the identities of things porous and inter-permeating, everything fluidly pouring into and out of everything else, no rigid boundaries or hard edges, no intractable resistances, everything responsively seeking a space for itself in the moving jigsaw of others, then the world of outer sense has the same quality as the inner field of consciousness, in which thought and experience inter-morph and inter-permeate, resolve and dissolve, in just this fluid kind of way. The world of outer sense, in other words, has a character consistent with its being the outer expression of an inner field of subjectivity.

Indeed, one definitive question that can never be answered by physics, 'Why does the world cohere?', has an almost self-evident answer from the strategic perspective. Or rather, it has no more need of an answer than does the question, 'Why does the field of my own subjectivity cohere?'. The question arises for physics because when the world is conceptualized in physicalist terms, as a manifold of logically discrete physical elements only externally and contingently stuck together by causal laws, then it is a mystery why these elements remain stuck together – why the 'laws' continue to hold. For, as we have seen, nothing can be shown to anchor those laws, ontologically speaking. Causality has been unmasked as illusory, at least insofar as it is supposed to confer natural necessity. There is therefore no reason why the universe should not simply fall apart at any moment. On the other hand, when we consider the nature of subjectivity, it is immediately self-evident that it is a field-like phenomenon. I can no more conceive of subjectivity as free-floating, un-referenced to a subject, or of a given subject's subjectivity as somehow scattered or existing in discrete fragments, than I can conceive of thoughts and feelings having hard edges or clearly defined boundaries. The whole phenomenology of subjectivity is of a unified though unbounded field-phenomenon with shifting patterns of activation permeated with patterns of meaning that take their shape and coloration from the field as a whole. No segregation of thought or feeling can occur in this field, and every instance of experience is shaped by the larger meanings that inform the field and whose continual unfolding may drive change in the field as a whole. Cohering then is integral to subjectivity. If reality is experienced as cohering in similar fashion, this is good prima facie evidence, from the viewpoint of the strategist, unencumbered as he is with dualist presuppositions, that he and reality share a common nature. Reality coheres because it is, like him, inwardly constituted as a subject, as a field of subjectivity.

The strategic perspective then is deeply conducive to panpsychist or psychophysical attitudes even though it does not commit to panpsychism, or any other metaphysical absolute, in a fixed and predetermining fashion.

3. Western anticipations: Spinoza and Goethe

Amongst Western philosophers there are two that I would like to pick out as prophets of the alternative way of knowing that I am here characterizing as strategic as opposed to theoretic or discursive. I say prophets rather than proponents, because their utterances in this connection are admittedly obscure. Both are, as one would expect, neither materialist nor idealist but panpsychist in outlook. The first is Spinoza, the second Goethe. I shall consider Goethe first because he offers a much fuller account of his alternative to science than Spinoza does.[4] But Spinoza offers a schema of the relation between knowledge of the scientific kind and knowledge of a broadly strategic kind that I think provides a promising and appropriate way forward for those of us committed to panpsychist-type perspectives today.

Goethe famously eschewed both rationalist metaphysics (of the kind taken up, even after Kant, by his Romantic contemporaries) and the methods of classical or Newtonian science, while yet being an ardent student of nature, devoting himself throughout his life to detailed empirical studies of natural, particularly botanical, phenomena. Science was of little use in his endeavor to understand nature because, as leading Goethe scholar, Henri Bortoft, points out, Goethe regarded it, not so much as untrue, as misguided: it failed to capture what was intelligible in nature.[5] One of the principal ways in which it was misguided, according to Goethe, was in its reliance on analytical method. Working from an analytical perspective, the scientist seeks to explain phenomena by reducing them to their elements, to the logically discrete units out of which they are made. Insofar as these units are logically discrete, they are external to one another; the resulting order is an order of externality.

This was troubling on two counts. Firstly, to break phenomena down into discrete elements or units was to drain them of life. Life resides in wholes; when organisms are taken apart they are no longer alive. In order to understand the aliveness of nature we have to understand it in terms of its wholeness. Secondly, when nature is conceptually taken apart into discrete elements, it becomes necessary – as we have already observed – to postulate causal laws to stick the elements back together again. Causal laws are logically arbitrary 'add-ons,' discovered *a posteriori* rather than through any inherent intelligibility: Goethe recognized that we can never see *why* the causal regularities that we find in nature are as they are. In this he is concurring with our earlier arguments to the effect that nature as revealed by analytical science lacks intelligibility. Goethe found this situation unsatisfactory: we do not truly understand nature, he thought, unless we grasp *why* things are as they are.

To the analytical method, Goethe developed an holistic alternative that was uniquely his own. When studying natural phenomena – and it is his botanical studies which are best known – he looked for the inner principle that is manifested in the phenomenon. He called this inner principle the *Urphanomën,* or Ur-phenomenon – the primordial or "deep down phenomenon" (Roszak 1972: 331). The *Urphanomën* is the implicated whole that is manifest, though never exhaustively so, in any explicated particular. When studying the morphology of plants, it was the *Urpflanze*, or

4. The next several paragraphs are adapted from Mathews 2008a.

5. I am much indebted to Bortoft's wonderful book, *The Wholeness of Nature: Goethe's Way of Science* (1992; Lindisfarne Books), for my current interpretation of Goethe.

Ur-plant, that Goethe sought. The Ur-plant was to be understood not as a primitive ancestor-plant from which all later plants were descended, such as Darwin would propose. Nor was it a kind of Platonic Form of the plant, an essence or abstract universal which all particular plants instantiate. Rather, the Ur-plant was to be interpreted – and here I am again following Bortoft – as plant-life as a whole, considered as a single greater planetary life-form that propagates vegetatively into whatever niches are available, adapting to those niches in ways that result in the manifold variations of plant-form observable on earth.

To make further sense of this interpretation, at least in relation to botany, I would suggest that we consider the Ur-plant not simply as the manifest totality of the plant kingdom but as the determining but inexhaustible impulse that articulates itself in that totality. This impulse may perhaps be understood – straying from Goethe's (and Bortoft's) terms of reference and reverting to my own – as the conativity of the plant kingdom, its impulse to seek self-actualization. This conativity, existing 'deep down' within plant-life, is an inner impulse to exist that has its own felt vegetative rhythms or patterns of flow, its own large-scale grain or texture of becoming. Within each individual plant, moreover, this rhythm is uniquely inflected. Each plant, in other words, has its own inner vegetative 'signature,' a particular style of vegetative being which is discernible in every aspect of its self-expression. A given plant assumes its distinctive morphology as a result of the unique pattern of its conativity adapting to the contingent environmental context of its existence.

What is true for plants is true for all the other entities in nature. In any manifest entity there dwells, 'deep down,' the Ur-phenomenon, the conative impulse which finds partial expression in that entity. That expression is always partial because the Ur-phenomenon itself can never be fully articulated; it is a potential for form rather than form itself. The aim of Goethe's nature studies was to discover the Ur-phenomenon in any given context of investigation. From close observation of the style or signature of an entity, one can sense the informing unity of potential, the indwelling meaning, that patterns its conativity. Goethe's method was a form of intuitive perception that focused on particulars: through a practice of patient attentiveness to the particularity of entities the inquirer could gain a feeling for their inner grain or rhythm, an inner grain or rhythm that was discernible through the style inflecting every aspect of their actualization, including their actions. As soon as the Ur-phenomenon is intuited in this way, the form the entity takes in a particular environmental niche becomes intelligible: *this* is the way that an entity with *that* style of becoming would actualize itself under *those* conditions. We can see *why* the '*Ur*' of the plant world, for instance, introduced into a particular niche, develops the leaf and flower shapes, the hues and scents, the dimensions and habit, of the particular plants that occupy this niche. These shapes and hues are just the result of a particular vegetative tendency being placed in a particular jigsaw context of light and shade, moisture, wind, soil, insect-life, animals and other plants, and, like a pea to a pod, adapting its form to the contours of this slot.

In sum, to understand nature is, for Goethe, to intuit the generative, organizational impulse of the Ur-phenomenon – whether this be the Ur-plant or the Ur-animal or the Ur-planetary system. The Ur-phenomenon, I am suggesting, is the diffused but unified field of felt conative potential that informs the entity but is never fully articulated in it. In light of this it is clear why a Goethean intuiting of the Ur-phenomenon in no way results in a *representation* of nature in its actual, present dimensions, as science does; it in no way provides a *mirroring* of nature.

Rather, our intuiting of the Ur-phenomenon is tantamount, from a Goethean point of view, to our *continuing* or *extending* nature, or to nature continuing or extending itself through us. By this I take Goethe to mean that when we intuit the Ur-phenomenon our understanding itself actually becomes a further expression of the Ur-phenomenon. The organizational dynamics of nature which find expression in the efflorescence of the plant kingdom are actualized again at the level of thought in the mind that intuitively grasps the Ur-phenomenon. The thoughts of that mind are like ghostly tendrils arising from the very calyx of the Ur-plant, following the same organizational pathways already traced by leaf and flower and all the other phenomena of the natural world. Our thought, following the inner patterns of nature, is as much an emanation of the Ur-phenomenon as is the rest of nature. Nature can reproduce its organizational dynamics through the far-reaching tendrils of our understanding just as much as it can through the never-ending metamorphosis of leaf into stem into sepal into petal into seed-pod within the vegetative domain. Thought, properly channeled through Goethe's method of understanding, is leaf, in the sense that it is merely another emanation of the same inner organizational dynamics that are expressed as leaf.

For Goethe then the aim is not to *reflect* nature, to provide a discursive *representation* of nature, as in *theoria*, but to become, in our knowing, a further elaboration of nature, a tendril escaping from the calyx of the Ur-plant and discovering a whole new plane of self-actualization. In this sense the mode of cognition explored by Goethe may be considered to a degree *strategic*: through such cognition the knower ties herself into the patterned conativities of nature, and thereby makes her knowing a part of the larger self-unfolding of reality itself. For Goethe this strategic opportunity exists only at the level of epistemology. In this respect his commitment to what I am calling *strategia* is more limited than that of the Chinese sage, for whom the possibility of human agency expressing the organizational dynamics of nature extends to the whole of life: in all our activities we can follow the conative rhythms that animate the rest of reality.

Now let us turn to the second of the two Western philosophers I have selected as offering alternatives to the dualism of *theoria.* This second philosopher is the preeminent panpsychist of the Western tradition, Spinoza. As perhaps the most rationalist *and* most determinist philosopher in history, one whose entire system seems to turn around the axis of causation, Spinoza might appear to pose a counter-example to my thesis that panpsychism tends to elude the *theoretical* and concomitantly predominantly *causal* framework of Western metaphysics. But it is worth remembering that Spinoza ultimately identified three kinds of knowledge, of ascending degrees of adequacy, and therefore that the overt epistemology of his presentation in the *Ethics* might, as I explain below, be of a lower grade than the epistemology suggested by his ultimate findings.

This is not the place for a detailed exegesis of the notoriously opaque (but still glorious!) Spinoza. I bring him into the discussion only because I think his doctrine of the three kinds of knowledge provides a clue to the way the kinds of cognition I have dubbed *theoria* and *strategia* respectively might be positioned relative to each other: to posit *strategia* need not mean discarding *theoria*, but may rather be to situate *theoria* within a larger epistemological context. About Spinoza's panpsychist metaphysics I shall say no more than is needed to explain the doctrine of the three kinds of knowledge, nor will I attempt to justify the interpretations I rely on in this process. (It is not for nothing that Spinoza is named Spinoza: 'spinosity' means thorniness; the dictionary gives "a difficult argument or theory" as one of the meanings of spinosity, from Latin *spinosus*, *spina*, thorn. Spinoza made his argument difficult – bristling, like a hedgehog, with forbidding spikes, the better to protect the truth within. Indeed he is the ultimate hedgehog, knower of one big thing, as opposed to fox, knower of many things.)

First kind of knowledge: this is knowledge of what Spinoza calls *natura naturata* as opposed to *natura naturans*. *Natura naturata* is nature under its differentiated, explicated aspect, the Many, the manifold of particularized physical phenomena that we ordinarily observe around us. *Natura naturans*, on the other hand, is nature under its holistic aspect, the One, in which differentia are viewed not separately but through the lens of the internal relations that knit them seamlessly together into a cohesive unity. Reality itself is, for Spinoza, equally a Many and a One; it can be viewed under its 'modified' or conditioned aspect, as an aggregate of explicated elements (or modes, in Spinozist parlance) externally linked with one another in infinite causal chains. Or it can be viewed under its unmodified, unconditioned aspect, in which individual elements disappear, so to speak, into the internally self-organizing background structure of the whole.

Knowledge of the first kind is, as I have mentioned, knowledge of *natura naturata*, and corresponds to ordinary empirical knowledge: we receive impressions from the physical elements that surround us and observe contingent – causal – regularities amongst these elements. On the basis of these observations we arrive at our everyday opinions about the world and also posit the kinds of empirical universals that constitute science. What is definitive of the first kind of knowledge is that it consists essentially of information coming to us from the outside. We remain passive in the receipt of this information: it imprints itself on our senses and our understanding. There is no pattern in the information such that, in recognizing it, we grasp, in a genuine *act* of cognition, that the information in question make sense, that it must be so. For this reason Spinoza describes the ideas that make up the first kind of knowledge as *inadequate ideas*. They are not inadequate for practical or even scientific purposes, but they are inadequate in respect of intelligibility. Adequate ideas are such that, in the very act of grasping them, we can see that they must be true. The ideas of common sense and science are clearly not adequate in this sense.

Second kind of knowledge: Spinoza calls knowledge of the second kind *reason*, thereby creating no end of confusion, since it implies that all that is required for such knowledge is abstract and logical thinking. This is patently not the case, since science is eminently abstract and logical, inasmuch as it rests on inference from the universal to the particular, yet science would not qualify as knowledge of the second kind. In other words, knowledge of the second kind requires much more than deductive inference. It is still knowledge of individual physical elements or modes, and in this sense is still knowledge of the explicate aspect of nature. But it is when we begin to notice the relations amongst these elements that enable them to compose themselves into larger unities that we are ushered into the second level of knowledge. In other words, our ascent to the second level commences when we start to understand the explicate order, or order of externally related elements, in terms of the internal relations which knit these 'elements' into larger, 'conformational' unities (to revert to my own earlier terms of reference).

Spinoza provides little by way of illustration of the second kind of knowledge, but today ecology affords a rich reservoir of examples of the kinds of conformational unities that I think he has in mind in this connection. Consider again the case of the Blue Whale and its relations with krill. By paying careful attention to any particular Blue Whale, we will notice that its sieve-like mouth is perfectly adapted for consuming tiny krill. As soon as we notice this, we can immediately grasp how krill have actually shaped, actually structured, the morphology of the whale. We don't have to keep checking Blue Whales to see whether their relation to krill continues to hold as we do in the case of the empirical universals discovered by science. In this sense the relation between Blue Whales and krill is not like the relation between entities, such as billiard balls, which are only externally connected via causal laws. It is rather a relation whose necessity we can actively grasp. We can *see*, self-evidently, how whale and krill fit together. Once seen, this conformation cannot be doubted; in the very act of grasping it, we can see that it must be true. It is accordingly an *adequate idea*. (It is because of the essential *intelligibility* of knowledge of the second kind, the *self-evidence* of adequate ideas, that Spinoza describes such knowledge as *reason*: it shares the demonstrable and self-evident character of the propositions of mathematics, which also belong to this tier of knowledge.)

In knowledge of the second kind then, we begin to grasp the mutually structuring relations amongst things – the larger, conformational unities into which things fit. The explicate order of externalities that are only contingently – causally – connected with one another is starting to merge into the seamlessness, the wholeness, of an internally self-structuring background order. In discovering such conformational relations, we are arriving at what Spinoza calls 'common notions,' notions of the specific internal relational structures of things. Spinoza emphasizes that common notions are discovered via individual instances; large-scale samples are not required. Common notions, unlike the notions of either common sense or science, are always adequate ideas. (My remarks here owe a lot to Deleuze's understanding of the key significance of common notions in Spinoza.)[6]

Third kind of knowledge: Spinoza calls knowledge of the third kind *intuition*. The transition between the second and third kinds of knowledge is smooth and gradual. What shifts is not so much the *mode* of cognition as the *goal* of cognition. At the third level, the goal becomes, precisely, strategic, although Spinoza does not put it in quite this way. For as the world becomes truly intelligible to us, in the second-level sense, as we truly grasp it in an act of understanding, and are no longer merely receiving arbitrary information from without, as we do at the first level of knowledge, we ourselves become truly active. We become truly active in the sense that our cognition is now no longer merely a conditioned response to causal input, as it is when we register perceptual information or memorize rules or absorb lessons. It is no longer merely a matter of (as we might put it) neuronal determinism. In attaining adequate ideas, our understanding is released from its neural conditioning and actualizes a kind of sovereignty that pertains uniquely to it. Once it has understood why the angles of a triangle add up to two right angles, for instance, or how the pieces of an ecological jigsaw fit together, it can no longer be conditioned to see these matters otherwise. Its thinking is in this sense no longer merely the product of prior causes; it has risen to a new level in which it becomes relatively self-directing. The source of its self-directedness is its capacity to grasp the intelligible. In grasping the intelligible, we not only see how reality itself is internally self-structured; we ourselves become relatively internally self-structuring.

In the dynamics of conformation then the universe transcends the arbitrary necessity of causation and attains instead the active necessity of its own holistic nature. In grasping those dynamics we in our turn also transcend our conditioned status and move towards self-structuring in accordance with the self-activating power of thought. Since the task of all living things is, for Spinoza, essentially conative, and since he defines conatus as the will of each thing to persevere in and increase its own existence, we, as cognitive beings, fulfill our conatus by achieving true self-actualization through the self-activating power of thought, instantiated in the third kind of knowledge. In this sense the goal of cognition was, for Spinoza, self-actualization, and in that sense *strategic*, all along.

To follow Spinoza's doctrine of the three kinds of knowledge then is to nest the first kind of knowledge, which includes what I am here calling *theoria*, in a larger, intuitive kind of knowledge in which the intelligible, self-active and self-organizing aspect of reality is revealed. Spinoza is not very forthcoming as to how such a larger kind of knowledge is to be acquired, but at the second and third levels cognition is inextricable from agency: the knower discovers conformational relations amongst things, and thus arrives at 'common notions,' by actively entering into such relations with other particulars. That is to say, by entering into internal relations with particulars whose natures 'agree' with her nature, and avoiding relations with others whose

6. See G. Deleuze, *Expressionism in Philosophy: Spinoza* (1992; New York: Zone Books).

natures 'disagree' with hers, she experiences at first hand the way the world is put together, the way particular elements are composed and discomposed by their internal relations with one another. Spinoza's knower thus arrives at true knowledge – knowledge of the second-through-to-the-third-kind – not via the abstract machinations of *theoria* but rather via sensitive attunement of her agency to immediate environmental pressures and influences. Self-realization and true understanding are inextricable outcomes of this process. At this level then, the modus operandi of the Spinozist knower is strikingly comparable to that of the Chinese sage, bent as the latter is on honing his cognitive faculties through trained accommodation to influences in his immediate environment. Spinoza does not pretend that attaining knowledge of the third kind is easy; the way to it is as demanding as the way of the sage, and as few are called to it. But this doesn't mean that it should not be recognized as the necessary context for the more ordinary registers of knowledge connoted by *theoria*.

Spinoza's *Ethics* is presented strictly deductively and discursively, as an ideal totality, and in that sense as *theoria*; but that need not entail that this was the way in which he actually attained his central insights. Given his awareness of the ascending scales of knowledge, there is every reason to suppose that he did indeed arrive at his insights intuitively, by cultivating his agency in the manner prescribed by the third kind of knowledge.

4. Conclusion

Philosophy in the West has by and large followed the approach of *theoria* in orienting itself to reality. *Theoria* represents an epochal developmental achievement of human consciousness and has demonstrated its enormous instrumental efficacy in the expansion of science and technology in the modern period. However, it is important also to recognize the limitations of *theoria* as a guide to understanding. In Spinoza's terms, it represents only the first level of knowledge. It can identify external and causal relations amongst the nuts and bolts of physical reality – the elements of *natura naturata* suggestive of a materialist order. But its essentially dualist epistemology does not dispose it to reveal the conative inter-dynamics that mesh things into the kind of self-structuring unities that, I argued earlier, would typify a psychophysical order. *Theoria* is not, in other words, disposed to reveal reality under the seamless psycho-active aspect of *natura naturans*.

In order for this aspect of reality – which is of course the aspect of interest to panpsychists – to come into view, a different mode of cognition may be required, one which is cultivated not merely through abstract 'reflection' but through specific forms of strategic practice, examples of which exist most explicitly and prolifically in the Chinese wisdom tradition. In this larger context of cognition the perspective currently described as panpsychist may come to seem natural, indeed self-evident, to practitioners. As long as our cognition is confined exclusively to *theoria* however, we can expect panpsychism to remain psychologically unconvincing and hence marginal to the imagination of the West, regardless of how rigorously it is theorized.

CHAPTER 19

Minds, objects, and relations

Toward a dual-aspect ontology

David Skrbina

If it is true, as Aristotle said, that metaphysics is first philosophy, and if mind is a central fact of human existence, then we have perhaps no more urgent task in philosophy than a careful investigation of the metaphysics of mind. And yet, even after 2,500 years of effort, the mind is at best dimly understood. The dominant materialist view has, quite frankly, made a mess of the situation. It is committed to the paradoxical situation that 'the mental is physical' while at the same time holding that 'the physical' is non-mental. Under such conditions the mind can only be accounted for by some near-miraculous process of emergence – of mind arising from that which has no mind whatsoever. It is furthermore said to emerge only in certain highly-rarefied physiological structures, such as those found in advanced mammalian nervous systems. But we have almost no details as to how this whole process really works; it is largely a matter of faith. From a theoretical, philosophical, and intuitive standpoint, this account is severely wanting. It is likely, then, that at least some of our core assumptions are incorrect, and stand in need of major revision.

Consider the monist/dualist contrast. With respect to the ontology of mind, we find that dualism casts a long shadow on us all; its influence is more pervasive than most would suspect. Going back to Plato (in the West) and to Samkhya Hinduism (circa 1000 BCE) in the East, dualism is, in one sense, an intuitively obvious view. A living person appears, superficially, to be physically unchanged by the immediate passage into death. On the surface, death is not obviously different than sleep. But there is one noticeable difference, of course: the breath is gone. With breath goes the power of self-movement. The body remains but the spirit, the psyche, the mind has vanished. Since we cannot see it, one easily concludes that it exists on another plane, a different sphere of reality – evidently, the psychic sphere. This event, this mysterious migration of the psyche, is unique in our experience, and thus we are drawn to conclude that there exists a second world or realm, distinct from the ordinary physical one. Were we to have repeated, firsthand knowledge of other, different such happenings we might deduce a three-part (or more) cosmos; but we do not – hence dualism.[1]

This folk notion of dualism has at least three important consequences. First, if mind (soul) is separable from matter, then matter itself has no mind and no soul; it is intrinsically inert and lifeless. Enmindedness, or ensoulment, could not by definition be an essential characteristic of material reality. Prior to dualism this was not the case; material things were widely regarded as living and animate. Once we entered the dualist (theological, rationalist) period, spirit was vanquished from matter; it became lifeless, a merely mechanical substrate of the world. Dualism was thus the first step on the road to modern 'mechanistic' materialism.

Second, in separating mind from matter, dualism implicitly created a *value hierarchy*: soul has value; matter, intrinsically, has none. Soul (/mind) is eternal, matter temporal. The former is divine, the latter base. Material reality is just so much stuff, available for our use and consumption, serving the greater mission of humanity. In fact matter only acquires value because of human intervention. We give value to matter by making things of it; prior to this, it has only potential.

Finally, the fact that the human mind is unique among the creatures of the Earth (obviously true) combined with the (arguable) notion that we are more intelligent, quickly evolved into the idea that we are 'superior.' Hence the Grand Creator must have held us in some special regard. We were his favorites, the most like him. Humanity is thus seen as ontologically distinct, or at least so different in degree that we constitute a difference in kind.

Thus has dualism worked its way into Christianity and other religious worldviews, into Cartesian philosophy, and into common sense. Philosophically, this has become manifest in the notion of *human exceptionalism*: the idea that our enmindedness is a rare, possibly unique event in the cosmos. Human mind is the 'one true mind,' and all others, including the so-called higher animals, are, at best, a faint reflection. Only into the 20th century has the power of dualism abated, and its influence on philosophy of mind gradually and progressively weakened. But the ideas of human exceptionalism and non-experiential matter remain strong.

With the fading of dualism, monism has come to be the favored view – as it was at the very beginning of philosophy. Not only does it avoid the interaction problems of dualism, but it is more aesthetically and (some would say) intuitively satisfying. But lest we forget: it was the dualism that banished mind from all natural objects. In

1. By dualism I mean, of course, *substance* dualism, in which mind and matter are seen as two radically distinct entities. There is not only the obvious and long-standing problem of interaction between mind and matter, but also the metaphysically arbitrary parsing of reality into two portions. Why two? Why not three, or four, or ten? Furthermore we have this apparent epistemological mismatch in which we can explain the physical so well (we think), but the mind so poorly – even though, ironically, the mental is the more immediately present to us. Why should we be able to make precise and definitive pronouncements on physical reality, and yet be left in a lurch when it comes to the mind? Substance dualism has no good answers for us.

finally surrendering dualism, we ought at least reconsider its historical counterpart: *reanimated nature*.

No doubt we have progressed by moving beyond formal (substance) dualism. But then the question of mind is immediately raised. How can mind, which seems so different from the physical, coexist with it in a cosmos that is ultimately 'one'? How can it *be* physical? The prevalent notion of human exceptionalism leads to one class of answers; a different view – that of true human *naturalism* – leads to another.

Ideally, I think, we would like to do justice to the strong intuitions about dualism without being committed to anachronistic or theological notions. We would also like to embrace ontological monism and yet account for the mind in a fully naturalistic way. And I believe there is a way forward here, namely, via some panpsychist conception of mind. The long and venerable history of panpsychism is now acknowledged, so we need not worry about how 'radical' or 'extreme' a view it is. Galen Strawson has, furthermore, persuasively argued that physicalist emergence is incomprehensible; this in itself leads to panpsychism. And if, finally, we accept that the human mind is a real and concrete phenomenon, then it must have arisen in a logical fashion from experiential atomic particles – though precisely how this works is an important open issue, and remains to be explained.

What we should be seeking, then, is a naturalistic, panpsychic, monistic account of the mind that accepts the evident reality of the physical world, as well as the evident reality of our own mental life. In my view this is best accomplished through a dual-aspect form of monism.

This monism is furthermore indicative of a holistic and interconnected cosmos. I will thus argue for a strong form of holism in which *every object stands in permanent but variable relation to every other object*. Furthermore, objects don't merely stand in relation; they *are* relations, in a very real sense – relations between their internal parts (which are themselves bundles of relations), and relations with all that exists. Such a theory of panrelationalism is not new; it dates back at least to Leibniz and his monadic theory, and is reflected in the writings of Diderot, Whitehead and Hartshorne (panpsychists all). But I hope to give it a new interpretation.

1. Physicalism versus dual-aspect monism

As the dominant form of monism today, physicalism is accepted as 'obvious,' but usually without an acknowledgment of its very serious problems. Physicalism has three core assumptions: (1) The ultimate reality is 'the physical,' a putatively monistic substance or entity that is typically left undefined.[2] (2) Physical reality is

2. It is unclear that physical stuff even counts as 'one thing.' Mass particles are reducible down to *two* entities, quarks and leptons. Force-particles come in four irreducible varieties (gravitons, photons, gluons, and intermediate vector bosons). Thus we seem to have at least six kinds of

fundamentally objective; that is, independent of the observer, and amenable to third-person descriptions. Its only relevant characteristics are extrinsic; consequently they are also quantifiable and measureable. (3) Physical reality is, in itself, absolutely devoid of mind; it is intrinsically non-experiential and lacking any mind-like quality. The net result of these three conditions is a view best referred to as *mechanistic physicalism*. To call it the majority position today is an understatement.

The problem then is to account for mind – a phenomenon, furthermore, colored by our implicit notions of human exceptionalism. Given mechanistic physicalism, mind must be shoe-horned into the world. But it refuses to fit.

This is no accident; the very definition of mechanistic physicalism is anathema to mind. And this leads us into an array of problems. We have no good explanation for how mind emerges from a non-mental substrate. We cannot account for qualitative experience or qualia – why we have it, and why it is the way it is. Mind often seems to be an arbitrary and expendable epiphenomenon, lacking in causal efficacy. Furthermore, *intentionality* is a major puzzle. Particles and forces seem to be devoid of semantics; they are not 'about' anything; they do not 'represent' other things. They simply exist and respond to various physical events. Our real-world experience of beliefs about things, and desires for things, seems to be unaccounted for. Finally, consciousness is inherently subjective, and yet everything physical, and thus real, is objective. As such, consciousness and mind exceed the analytic capabilities of objectivist science, and outstrip our usual third-person accounts of things.

Summarizing the situation, Nagel (1974: 446) has stated it concisely: "physicalism is a position we cannot understand because we do not at present have any conception of how it might be true." Levine (2001: 68) concurs: "[there is] an important sense in which we can't really understand how it could be true." Strawson (2006: 4) derides the standard conception as 'physicSalism,' i.e. the notion "that the terms of physics can fully capture the nature or essence of experience" – a position he calls 'obviously false.'

Given these deep-seated problems with mechanistic physicalism, how can we proceed? One option would be to defend the view by attempting to explicate some rational emergentist theory of mind – a move which seems obvious but has so far failed to materialize, despite the best efforts of some very bright people. Some (e.g. McGinn 2006) are giving it up for lost; emergence, they say, may never be explained. And yet, by an act of faith, they still cling to the notion that it must be true.

We might well be better served by retaining the naturalistic monism but *rejecting all three* of the core physicalist assumptions; namely, we might allow that (a) 'the physical' may not be the ultimate reality, (b) subjectivity may be a central aspect of existence,

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ultimates. We like to lump them all together under the label 'mass-energy,' and we try to unify them all via string theory, but as yet these approaches are physically and philosophically unsatisfying. Not to mention troublesome 'substances' like *dark matter* (which gravitates but is otherwise invisible) and *dark energy* (whose only salient characteristic is that it emits negative gravity!) – which, combined, account for fully 96% of the known universe. One can be excused for questioning the 'monism' – not to mention coherence – of physicalism.

on par with objectivity, and (c) the one reality may in fact be fundamentally experiential, or mind-like, in some way. In other words, we can reject both the 'mechanistic' and the 'physicalism' if we are willing to consider more viable metaphysical systems.

Once we have rejected the three assumptions, a number of alternatives open up to us. One is idealism – matter reducing to, or supervenient on, mind. Though a decidedly minority view these days, there are still good things to be said for such an approach; but I will pass that over here.

Two further possibilities exist, both of which respect our folk intuitions about dualism. We could adopt a neutral monism, along with its accompanying burdens of explaining how both the mental and the physical emerge from a more primary substance, and what that substance is. This view also has a long and honorable past, dating back to Anaximander in the West, and even earlier for the Advaita and Vishistadvaita schools of Hinduism.

A more promising approach, I think, is dual-aspect monism. As two equiprimordial aspects of a single underlying reality, the mental and the physical are on equal footing. Like the two sides of a coin – each of which is the truth of the thing from a certain perspective – so it is with a two-sided reality. We see its mental or physical aspects depending on which point of view we take. Reality *is* physical – but at the same time and at once, it *is* experiential.[3]

In truth it can be difficult to distinguish between dual-aspect and neutral forms of monism, especially in historical figures. Spinoza is cited as both, depending on the commentator's inclinations. Schopenhauer, Hume, Fechner, Mach, James, and Russell are also commonly associated with both. More recently the physicist David Bohm has argued for such a view, as has Nagel.[4]

Notably, except for Hume, all the above were also panpsychists – suggesting a natural connection.[5] If the one reality has the intrinsic capacity or potentiality for mind, or if it presents itself to us from one perspective as mind-like, then it seems likely that some mental or experiential quality would be manifest in all that exists. And it seems very *unlikely* that mind would be manifest only in a handful of creatures, perhaps even

3. Sometimes this view is called *property dualism*. But this term is ambiguous because it can apply to either (substance) dualist or monist ontologies. What I have in mind here, obviously, is 'substance monist property dualism' – which is better and more concisely expressed as 'dual-aspect monism.' Neither mind nor matter is reducible to the other; neither supervenes on the other. And neither reduces to a more fundamental entity. Both are simply aspects or attributes of a single reality which in some way participates in both. Following Schopenhauer, Peirce, and others, I find it useful to speak of the physical as the outer or external ('extrinsic') perspective, and the mental as the inside or interior ('intrinsic') perspective.

4. Nagel writes, "It seems to me more likely, however, that mental-physical relations will eventually be expressed in a theory whose fundamental terms cannot be placed clearly in either category." (1974: 450).

5. For an overview of these individuals' positions vis a vis panpsychism, see Skrbina (2005).

of a single species, on a rather ordinary speck in the outer reaches of the Milky Way galaxy, at 15 billion years or so into the life of the universe.

But simply holding to a dual-aspectist (or for that matter, neutral monist) view does not entail panpsychism, despite the natural affinity. Panpsychism requires rejecting both the 2nd and 3rd assumptions. As a consequence, the ultimate components of reality, whatever they may be, have fundamentally experiential or mind-like qualities on par with core physical characteristics like mass, spin, charge, force, and quanta. Though there are independent reasons for accepting such a view – such as the incomprehensibility of brute emergence of mind – I simply note here that panpsychism is the necessary consequence of rejecting mechanism and the accompanying emergentism.

One word for the idea that reality is inherently experiential or life-like is 'hylozoism' – matter (*hyle*) as alive (*zoon*). This has come to be a term of disparagement, typically applied (misleadingly) to the ancient Greeks and their "naïve" conception of the world. Since we now have a better notion of what it means to be alive, and can now explain its existence and emergence in standard physicalist terms, it would be better to adopt a revised terminology. For the Greeks, mind was *nous*; hence I propose the term *hylonoism* – matter as enminded.

So the view I am advocating here is a panpsychist dual-aspect monism, one that grants equiprimordial status to mind and matter, and sees both as inherent in all that exists. This is all condensed into my term 'hylonoism.' As to the one reality itself: simply naming it is problematic (cf. Strawson's debate over the term "?-ism"). We can call it simply 'reality,' or (more mystically) 'one.' Or maybe borrow Anaximander's *apeiron* – the 'indefinite.' Perhaps we can sympathize with Spinoza's dilemma: "God, or Nature." Let me propose instead a term that draws on the ultimately *participatory* nature of the cosmos. As I have argued elsewhere, participation, a concept originating in Plato, can be seen as the most fundamental principle of reality.[6] The one participatory reality, then, could be referred to as the *particeptikon* – yielding a monism which, via participatory processes, is revealed to us as physical and mental realities. But an elaboration of the particeptikon must wait for another day; here I am simply concerned to outline a viable dual-aspect theory of mind.

2. The spectrum of mind

Lest we get too concerned about the wanton use of such a vague term as 'mind,' let me try to flesh it out a bit. On the standard view, the most basic distinction we make is between conscious and unconscious mental states. Study of the unconscious mind has been around at least since the time of Leibniz (with significant contributions from Von

6. For Plato 'participation' was a dualistic concept, which is obviously different than I am proposing here. But for him, as for me, it is central to notions of being and becoming.

Hartmann and Freud, among others), but it is a notoriously slippery topic.[7] And yet we can hardly ignore it; given the evident difficulties in finding the neural correlates of consciousness, unconscious states may well represent the larger portion of our total mental capacity. It must be included in any comprehensive theory of mind.

For obvious reasons, however, most philosophical work has been on consciousness – a term which itself is neither easy to describe nor analyze. Nagel's (1974: 436) famous 'what it is like' is perhaps less than satisfying; in Lycan's view the phrase "is now worse than useless" (1996: 77). Current consensus points to the notion of *qualitative experience* as key, and deploys such terms as qualia, phenomenality, and subjectivity as the definitive markers of consciousness. But consciousness also encompasses such notions as awareness, intentionality, and higher-order thinking – concepts which are generally allowed, however, to extend into the unconscious and thus cannot define consciousness itself.

One of our problems, I think, is that the conscious/unconscious distinction implies a far more clear-cut separation than is the case. Conscious and unconscious states seem to gradually fade from one to the other. The admitted extension of nominally conscious designators – such as intentionality (belief, desire, perception), awareness and cognition – into the unconscious is one pointer in this direction. Neurologically speaking, nothing seems to mark off conscious states from others. Furthermore, unconscious states can be accessed and drawn into the conscious realm, implying some kind of continuous pathway between the two. And phenomena like hypnosis and lucid dreaming further point to a blending of these realms.

Additionally, both consciousness and unconsciousness seem to admit of degrees. Beyond 'ordinary' conscious awareness, we have states corresponding to *self-consciousness*. Then there are higher-level states that we might classify as *introspective*, or self-reflective. At the highest level we can perhaps identify *meditative* or so-called enlightened states of mind – states that arguably transcend consciousness itself. With respect to the unconscious, perhaps Freud's old notions are helpful here; it seems useful to speak of a range of unconscious states, running from the deep subconscious through (at least) a shallower range of what we might call the preconscious.

Thus, instead of referring to sharp divisions such as consciousness over and against the unconscious, we might more profitably speak of a continuum of mental states, with fuzzy transitional boundaries between them. The traditional conscious/unconscious dichotomy dissolves in place of a spectrum of mental states that run from the deepest, least accessible, least aware states all the way up to the loftiest introspective or meditative states. Each phase is continuous with the other, yet marked by distinctive qualitative changes, in much the same way that electromagnetic radiation moves through a spectrum of frequencies, progressively assuming different qualitative 'colors' (for us), yet existing on an ontological continuum. Furthermore it opens up the

7. For a more recent analysis, see Searle's 1991 piece, "Consciousness, Unconsciousness, and Intentionality."

possibility of conceiving the simultaneous existence of states at multiple levels. Such a spectrum of mind is conceptually more satisfying than a scheme of sharp, rigid, mysterious breaks, and it allows us to treat of mind in a more general way.

Apart from the conscious/unconscious split, we have other common distinctions such as that between *qualitative* (phenomenal, subjective feelings, qualia) and *intentional* states (referent to other things in a meaningful way, as in the case of beliefs, desires, and thoughts). Neither of these fit easily within the physicalist picture, nor does the very distinction itself. Nothing about a mechanistically physical world tells us, for example, why beings have qualitative experiences at all, nor how they might arise. Worse than that: As Nagel has argued, subjective, first-person qualia are fundamentally opposed to the objective, quantitative, third-person stance demanded of everything in a physicalist universe. It would seem that physicalism is inherently incapable of accounting for qualitative experience – and thus essentially incomplete, and thus a false pretender to a full account of the mind.

3. Six characteristics of mind

A rejection of the three core assumptions of mechanistic physicalism is only the first step towards developing a dual-aspect panpsychic or hylonoetic theory. Any satisfactory approach must account for certain primary aspects of the mind. Six of these are, in my opinion, of particular importance:

1. **The unity of consciousness**. Almost everyone grants that there is a *prima facie* unity to conscious experience. It may be a complex kind of unity, or a fractured one in some rare cases, but few deny that our minds have a kind of focused, singular nature in which diverse sensory inputs are unified into an organic whole. Experience is 'one thing,' even if it is composed of many simultaneous modalities.[8]

2. **Qualia, or qualitative experience**. The precise metaphysical standing of qualia is in dispute, but I take it as self-evident that different mental states *feel* different. They range from gut-level feelings (pain, hunger, fear), to more emotional states (sadness, happiness), to the sensory (sight, smell), to yet other more abstract feelings. Some have very little feeling to them at all (specific beliefs, for example, or certain analytical or computational states.) But in general we know the feelings of these various states, and we are quite good at describing and communicating them to others, based on our shared experiences. The problem is to account for them in a theory of mind.

3. **The 'conscious/unconscious' distinction**. Moving beyond the old dichotomy, we now ask: How can we account for a spectrum of mental states that respects a continuity between them?

8. For more on the unity of consciousness see Cleeremans (2003) or Tye (2003).

4. **The unity of the personality**. Again, and allowing for exceptions, most people display a consistent pattern of thought and behavior over time. The personality changes, but slowly and by small increments. In many, it is consistent and recognizable from early childhood through death. Disregarding the concept of a soul, how can we account for this phenomenon?

5. **Knowledge**. A standard epistemological question, but here I will focus on knowledge as the retention and retrieval of information – that is, knowledge as an aspect of memory (as opposed to purely epistemological notions, like justified true belief.) We have physiological accounts of memory as persistent change in the structure of the brain, but this notion needs to be expanded and better-described within a coherent concept of mind.

6. **Intentionality**. The fact that many of our mental states are directed at a particular thing, or represent some particular thing, is generally regarded as central. This would include, at least, notions like belief and desire, as well as thought, cognition, and perhaps even perception. How can we understand 'representation' in a meaningful way?

To make progress on these issues, even to a first degree of explanation, would constitute a significant development toward a viable theory.

Additionally, given my adoption of the panpsychist stance, a unique problem arises: the parts of my body, down to the very atoms (or physical ultimates), constitute mental entities. My body has many 'minds,' and yet somehow I have only this sense of a singular conscious mind. Do the lesser minds combine together to form my higher-order mind? If so, how does this happen? Do they stand in some sort of causal relation to it? This is related to the problem of sensory unity (#1 above), but magnified greatly; it is the so-called *combination problem* of panpsychism. Such questions are important, and must be addressed by any adequate theory.

4. Dynamical systems and the mind

Any movement on these issues will inevitably be colored by the analytical techniques that we choose to employ. The tools we use shape the outcome; in a very real sense, results embody methodology. If our analytical approach is 'mechanical,' that is, contains implicit mechanistic assumptions or employs machine-like techniques and analogies, then we can expect mechanistic conclusions. If, on the other hand, we adopt the most general methods at our disposal, then we have a better chance of finding a truly general theory of mind.

For many years now the leading conceptual approach to mind has been *computational*: the brain is viewed as a kind of biological computer that processes information. It has inputs (sense organs), outputs (muscles and motor neurons), and a central processing unit (neocortex). It is even 'digital,' in that the neurons fire under discrete conditions; they are basically on or off, with no in-between. Incoming information is somehow coded into mental symbols, and these symbols, which represent things in the world, are manipulated to achieve some end – this is the 'language of thought' concept championed by Fodor and others. The process of mind, then, is simply this manipulation of internal symbolic representations. Mind is the software that runs on the hardware of the brain. When translated into a theory of mind, we get functionalism – the idea that mind is defined by the corresponding functional or causal role.

Because of the parallel, interconnected, multi-modal feedback that characterizes neocortical neurons, some scientists and philosophers have modifed the standard computational approach such that it more closely matches the neural network structure of the brain. Individual neurons are represented by simple binary decision elements, each of which are connected to many other such devices via variable-strength 'resistances' or links (to model the real-life plasticity of neural synapses.) This strategy, *connectionism*, is more organic and lifelike, but is still, at heart, a computationalist approach. The mind is still in the brain, and the brain is a connectionist device that operates in parallel rather than serially. Computations are performed in an analog rather than digital manner, and information is stored in the various synaptic 'weights,' which evolve over time as the system processes information.

Both the computational and the connectionist models were developed for a specific organ, namely, the human brain. Thus they are unlikely to work for other systems that may embody mind. Fortunately we have a third alternative that is more universal, and hence more relevant, than either of these two: dynamical systems theory (DST).[9] The oldest of the three techniques, it dates back to Poincare's work in the late 1800s, and for most of the time since then has been primarily a tool for physicists and a topic of mathematical study. By the mid-1970s it blossomed into chaos theory; fractal patterns were discovered; and its application expanded to new fields. DST turned out to have a very wide range of uses – not surprising, since it deals with physical structures in a most general way: as continuous time-varying systems undergoing energy processing and exchange. As such, DST can be applied to any object and any system whatsoever.

Of course, this approach is not without limitations. It is a physicalist technique, and applies to physical systems. It is mathematically abstract, using differential equations and iterated mappings to describe change over time. But most importantly, it is lacking an underlying metaphysic; that is, it provides no account of the nature of reality in itself. Thus it must be supplemented by at least the rudiment of an ontological theory – here, dual-aspectism – in order to become more fully coherent. These problems notwithstanding, DST is perhaps the most general technique we have. If we can hope to apply any conventional analytical tool to panpsychist theories of mind, this is it. I won't promise that it will solve all problems. But it can highlight certain difficult issues, and provide some useful illuminations on key aspects of mind.

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9. Also occasionally referred to as nonlinear dynamics, complexity theory, or chaos theory (explained below).

The clearest application of DST is probably the simple pendulum, so it is worth taking a moment to describe this elementary case. As a physical system, a swinging pendulum can be described in many ways: according to its mass, material, color, size, and so on. But in terms of its primary dynamics as a pendulum, only two things matter: the position of the weight (measured, for example, relative to straight down), and its velocity. As the weight swings to and fro, both the position ('x') and velocity ('v') are continuously changing; these capture the temporal dynamics.

Mathematically, we can plot these changing values on a two-dimensional graph, with one x-axis and one v-axis. This two-dimensional graph represents the *state space* of the pendulum system. As the x-value moves back and forth between (say) +10 and –10 cm, the velocity changes between (say) +20 and –20 cm/second. The velocity is momentarily zero at either end of the swing, and maximal when the weight is at the bottom. At each point in time (t), the pendulum's state can be described by a pair of numbers, (x_t, v_t).

On the graph we can plot all pairs of numbers (x_t, v_t) that the pendulum experiences over time. These points are not randomly scattered; in fact they end up arranged in a circle (or oval, depending on the scale). At any given point in time the pendulum 'exists' at one specific point on that circle. As it swings back and forth in physical space, its 'point' moves around the circle in state space. This one point, along with its path (trajectory) in the state space of the pendulum, completely describes the energy dynamics of the system – at least, to a first order approximation. (A second-order description might include the slight motions of the individual parts of the pendulum, the frame, the base, and so on. A very complete description of the pendulum would go right down to the atomic level, and include the quantum energy state of every individual particle in it.)[10]

Some striking facts about this analysis: First, its inherent simplicity; a single point moving continuously in a multi-dimensional space. It is frankly rather amazing that such analysis works at all. Second, as mentioned above, it holds not only for simple mechanical systems but for all objects and systems. Penrose (1989: 177) nicely summarizes the universality of this approach:

> A single point Q of [state] space represents the entire state of some physical system... [T]he entire evolution of the system in time – no matter how complicated that system might be – is described in phase space as just a single point...

By the phrase 'no matter how complicated,' he means things as small as a single atom, or as large as a planet, star, galaxy, or even the entire universe. Obviously, then, DST is fully applicable to the human brain. But the brain requires different state variables (other than 'x' and 'v,' of course). So which are the most relevant? It is pretty clear that the neocortical neurons are key to higher-level brain function, and this is the obvious place to start. And in fact as early as 1986, Paul Churchland proposed essentially this approach – to use neural activity as the state variable, in order to map the brain's action

10. Though even this would not be truly sufficient – as I will explain.

in state space: “the brain represents various aspects of reality by a *position* in a suitable *state space*” (1986: 280). He explains further:

> The global state of any complex system composed of *n* distinct variables can be economically represented by a single point in an abstract *n*-dimensional state space. This state space as a whole can be neurally implemented…by a parallel set of only *n* distinct fibers. And a specific point within that space can be implemented by a specific distribution of *n* spiking frequencies… (p. 299)

If the neurons represent our state variables, we then require one dimension in state space for each of the 100 billion neurons in the human brain – a mathematical space of huge dimensionality. But this vast space will accommodate every possible combination of neural activity, and thus every possible brain state. If we furthermore accept that the brain is responsible for mental states and properties (which is true only to a first approximation – see below), then this analysis promises to tell us something meaningful about the mind. Churchland thinks it up to the task: ”it [has] the resources to account for the so-called higher cognitive activities” (p. 305).

In 1997 Churchland modified his approach slightly, focusing on the synapse states themselves. This can be seen as a second-order or higher-resolution view of the brain/mind. Notably, it raises the state space dimensionality to something like 100 trillion – one per synapse. But in principle the picture is comparable: a single point moving dynamically in a high-dimensional space.

A year later he begins to make progress in *interpreting* the state space model. As with the pendulum, it is the path, or trajectory, that the point follows that defines its characteristic dynamics. A circular path in state space corresponds to a regularly swinging pendulum; should it be allowed to gradually swing to a stop, the corresponding picture would look like a spiral, winding down to the center point (0, 0). In the brain, the trajectory swept out by the point would be much different. In addition to the vast dimensionality of the ‘mind space,’ the trajectory would be an intricately complex tangle of loops and cycles. Many regions of mind space would be frequently visited; others never. Patterns would arise, representing recurrent patterns of thought. These patterns would show complex self-similarity at different scales, representing the fractal-like nature of any nonlinear feedback system. We would find a complex hierarchy of patterns-within-patterns, at many different levels of dimensionality.

Furthermore, since the brain – like any physical system – is subject to nonlinear dynamical feedback, the quasi-chaotic action of the state space point displays a marked sensitivity to small changes in inputs. Subtle sensory inputs, even those below the level of conscious perception, have a nontrivial effect on the movement of the point. This is characteristic of all chaos-like systems (i.e. all physical systems).[11]

At this point we should ask how this interpretation might begin to address the central characteristics of mind. Briefly taking each of the six in turn:

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11. Known in the technical literature as ‘sensitive dependence on initial conditions,’ or, in popular circles, as the ‘butterfly effect.’

Unity of Consciousness: Somehow, the action of billions of neurons results in a single, unified experiential sense.[12] According to standard theory we lack even a conceptual model of how or why this happens. But here, we have a natural candidate. The state space point itself represents the collective instantaneous state of every neuron. And this is as it should be – one's brain state at any point in time must reflect the state of every one of its component elements. Thus the single point itself may be taken to represent the unity of consciousness. This unity is nothing other than the instantaneous state that the brain is in – at least, to a first approximation. And the first order approximation to the brain is neural activity. So we have an analytic picture of the dynamic unity of consciousness: a single state space point, buzzing around in the mind-space of the brain.

Qualia: As sensory inputs change, the brain state evolves correspondingly. In state space this means passing through different regions of space: 'red' stimuli will send the state space point to one region, 'rose scent' to another, 'pain' to yet another. This is exactly the process that Churchland describes. In essence, each point in state space 'feels' differently. Hence a specific quale can be assigned to each point. And due to the huge dimensionality of this mental space, many dimensions of qualia can be experienced simultaneously; it has no problem accommodating 'red,' 'sweet,' 'loud,' and 'throbbing toothache' all at once.

Spectrum of Consciousness: The vast neural mind-space is not only a qualia space, but undoubtedly, large regions of it correspond to general categories of mental states. Sleep states, for example, would mark out a large and distinctive region, as would anesthetized and coma states. But even within the sphere of consciousness we would expect to find distinct areas corresponding to, for example, ordinary alertness, self-awareness, introspection, and meditation.

But there is a depth of mind beyond the neurons. As with our pendulum, we know that the brain can be given a dynamical description at many physical levels: neural activity, synapse state, neurotransmitter state, molecular state, atomic state, on down to quantum state. Energy state changes occurring at these lower levels have an important if subtle effect on the overall state of mind. Their actions must somehow factor into the mind, since they are unarguably part of the complete brain system. So as we progressively incorporate lower levels of organization, the state space increases in dimensionality, and the depiction of mind increases in subtlety and definition.

I propose, then, that it is these sub-neural dimensions of mind that embody the sub- or preconscious states. Neural and synaptic actions are like the surface layers of the ocean, floating on a sea of molecular/atomic activity. This very surface – the brightly-illuminated upper levels of the mind – are experienced as consciousness, and the deeper, lower-level activities – neurotransmitter, interneural fluid, molecular, atomic – embody levels of mind below the conscious. On this view, conscious and unconscious mental activities are going on simultaneously, in parallel, at all times.

12. Also known as the binding problem.

Personality: As mentioned above, the state space point will tend to revisit certain regions of mind space on a regular basis, and avoid others completely. The trajectories will, furthermore, tend to etch out vastly intricate patterns in this space – forming quasi-chaotic cycles and patterns. The entire complex of regions and trajectories are a function of the physical organization of the brain, which undergoes winnowing and refinement from birth, yet without extensive neural rewiring. Thus we find quasi-consistent patterns emerging as a person matures. This whole network of frequented regions and trajectories – reflecting quasi-stable overall patterns of thought and action – can be interpreted as a dynamical picture of the personality.

Knowledge: These trajectories can be seen, Churchland says, as the embodiment of *representational knowledge*: "[the system's] primary unit of [semantic] representation is not the *point* in activation space, but rather the *trajectory* in activation space." (1998: 27). Trajectories depict memory. This makes intuitive sense. In the process of memory, the brain undergoes semi-permanent physical change at the synapses, lowering the junction resistance and allowing more energy to flow on to subsequent neurons. Certain groups of neurons thus tend to fire more frequently and in recurrent patterns. In state space this has the effect of routing the state space point through a kind of 'groove' or trough in space. Each time the brain passes through that specific sequence of states – through that same groove – the brain re-experiences the original event or experience, and thus remembers. We feel it as a kind of rough replay or reenactment of the original experience.

Intentionality: Elaborating on the above, if trajectories are the 'primary unit of semantic representation,' then they also embody intentionality. To be in the process of believing something, or of desiring something, is to recreate in the mind a pattern of activity associated with the target of that belief or desire. This is at least one important aspect of intentional thought. It can be enriched by incorporating preconscious levels of mind, and by considering the mind as literally incorporating external objects of belief or desire – more on this to follow.

5. The hylonoetic interpretation of dynamical systems theory

If DST were simply a useful analytical tool, or a model of theoretical or mathematical interest, its philosophical value would be minimal. But this is not the case. As discussed, the characteristics of brain activity presented by DST give us analogs to several key aspects of mind. It further suggests a hierarchical approach to mind that corresponds to higher- and lower-order mental states. And the notion of sensitivity to small change as a function of nonlinear feedback rings true with our own highly refined mental sensitivities.

These connections are too striking to be coincidental. In fact they seem to be inherent in the analytical approach itself. In other words, wherever we see these mind-like dynamics we have reason to interpret them as evidence of a mind-like ontology.

If state space is in fact a depiction of mind space, then any system amenable to this analysis possesses a mind-like counterpart. And since DST applies, with analogous dynamics, to all objects and systems in the universe, we may interpret this as a depiction of mind-like qualities in all things.

We do this – or at least, are justified in doing this – with other natural phenomena. We know that gravity works on two given masses (m and M) according to the formula $F = GmM/r^2$. Anywhere in the universe that we observe bodies moving under such a force, we are justified in interpreting it as gravitational. Other natural forces may follow similar laws. The force between two electric charges (q and Q) is of the same form: $F = kqQ/r^2$. Thus it could happen that we observe two objects accelerating toward one another according to an inverse-square relationship, but without knowing if it were gravitational or electric (or even something else). But we would know that *some* force was present, and that this force followed the pattern of natural law (such as inverse-square). The dynamics of the behavior tells us about the existence of a phenomena, and further knowledge (specific masses, specific charges) tells us about its qualitative nature.

Complex dynamics, then, are a representation of mental activity. They are the footprint of mind. Wherever we find them, there we can infer the presence of mind – and this is everywhere, at all scales of existence. Mind exists as counterpart to matter, in a corresponding mind space, as a secondary aspect to reality and correlated with all physical objects and systems. I emphasize that this is in no way intended to be a proof of panpsychism. It is simply an *interpretation* based upon our best understanding of how the human brain works, in light of our knowledge of dynamical systems. But it does lend support to a dual-aspect panpsychism, and it provides something of an answer to those who insist that there must be some 'sign' of mental activity, on the panpsychist thesis.

6. Externalizing the mind

Now consider the fact that the activity of the brain is not limited to the skull, but extends well beyond. Sensory (especially tactile) and motor neurons extend in networks throughout the body. Neurotransmitter chemicals enter the bloodstream and do likewise. Hormones released from glands and organs around the body affect brain activity. Blood flow, sugar levels, and oxygen delivery are obviously vital to the brain's function. In a very real sense, brain activity is the pinnacle of a system that pervades the entire organism. We *think* with our whole body.

A truer and more complete state space description of the brain, then, will involve the instantaneous state of the whole body – with, again, the neural activity floating upon the conscious surface. But the depth below is now more than simply the organ of the brain. It is as complex and structured as the body itself. It involves the collective states of each organ, molecule, and atom in the body.

Just as the physical state of the brain expands in dimensionality and complexity when we include the whole body, so too does the corresponding mind space. To a first-order approximation the mind is still determined by neural states, but below this we now include many lower orders that give depth and subtlety to the mind. Neurons still give us the conscious surface waves, but the water is much deeper than before; bodily states add levels of complexity to the sub-consciousness.

But we must notice something else. Each lower level also embodies its own state space. There is a meaningful state space description for each organ; for the limbic system; for each protein and macromolecule. Each subsystem at once participates in the bodily system as a whole, and exists as its own functioning system. This is a straightforward consequence of dynamical theory.

Therefore, each lower level of structure also has a corresponding mind-space. Each organ, each protein, each molecule has a mental aspect. Each *feels*. Each embodies memory and knowledge. Each experiences qualitative states, or qualia. Each carves out paths or trajectories in its own mind space, which in turn realize semantic representations or meaning. Each has a kind of unity of mind (though less complex and subtle than neural-like consciousness), reflected in its singular state space point. And each has a distinctive personality, in the overall network of states that it habitually occupies.

Such a depiction of a layered hierarchy of mind within the human body has an added benefit: it promises to dissolve the combination problem. Lower orders of mind coexist with higher, and participate in them. Atomic and molecular minds live their own subjective lives, even as they contribute depth to the levels of mind above them. The feelings and qualitative experiences of atoms exist in parallel with those of the bodily organs in which they participate. It is not 'combination,' but coexistence amongst simultaneous layers of the mental hierarchy.

What about moving beyond the confines of the body? Recent trends in externalism point to some striking claims, including that cognition, memory, and even consciousness extend beyond the boundaries of the skin, and reach out into the world.[13] How can hylonoism contribute to this? By recognizing that the state of the body/brain is

13. One of the first to make this claim was Gregory Bateson. In his seminal article "Form, substance, and difference" (1970/2000), Bateson noted: "The mental world – the mind – the world of information processing – is not limited to the skin." (p. 460). For him, mind was present in any cybernetic feedback loop in which energy differences circulated, and this necessarily extended beyond the body: "I suggest that the delimitation of an individual mind must always depend upon what phenomena we wish to understand or explain. Obviously there are lots of message pathways outside the skin, and these and the messages which they carry must be included as part of the mental system whenever they are relevant." (p. 464). Such a view carried Bateson to a pluralistic, hierarchic, panpsychic conception of mind – one which has much in common with the view presented here: "We get a picture, then, of mind as synonymous with cybernetic system... And we know that within Mind in the widest sense there will be a hierarchy of subsystems, any one of which we can call an individual mind." (p. 466). Apart from Bateson, more recent articulations of externalism can be found in Varela et al. (1991), Wilson (1994), McClamrock

intimately and inextricably linked to the world. Energy continuously reaches the brain via the body. Likewise, the brain and body continually discharge energy into the world. There is a ceaseless exchange of matter and energy, such that the state of each affects the other. And even if we allow for causal chains and time delays in this process, this does not alter the fact that the instantaneous state of my body and brain are a function of the instantaneous state of my surroundings. Even on a literal reading of modern physics, this is true (explained below).

Thus, a complete description of my brain/body system must include the state of all systems and particles that affect me. Air, light, food, pressures, forces – all aspects of my surroundings factor into the state of my body/brain complex, and thus into my state of mind. Recently Teed Rockwell (2005) has made an insightful and compelling argument for this view; as he sees it, the entire complex forms a "brain-body-world nexus" in which all parts are interconnected.

One further question, then: How far out does this process extend? The only consistent answer is. . .*all the way*. Consider a basic physical force like gravity. At this moment my body is feeling a force downward from the Earth, which I can calculate precisely. But it is also feeling a small, but nonzero, force from the table I am sitting at – again, precisely calculable. The moon, too, pulls on me even now. So does the sun, the stars, and the farthest quasars and black holes. These forces are very, very small – but not zero. They exist, and must factor in to any truly complete accounting of my body, brain, and mind.

If this is not enough, consider things at the quantum level. The subatomic particles in my body are not hard little balls of matter; they are dense zones of energy, tightly packed, but which diffuse out into their surroundings. Mathematically we think of this as reflecting a probability density. A given electron is very likely to exist, for example, in a given orbit in some atom in my brain. But there is a small chance that it will be found in a neighboring atom. There is a smaller chance still that it will be found in another part of my body altogether. There is a very small, but nonzero, chance that it will be found across the room from me – or on the moon, in the sun, or across the galaxy. In a very real sense, then, any given atom in my body exists throughout the entire universe.[14] This is not spooky mysticism; it is hard core quantum physics.

(1995), Clark and Chalmers (1999), Rockwell (2005), and Manzotti (2006a, 2006b). Of these only Manzotti is sympathetic to panpsychism.

14. Like so many aspects of metaphysics, this idea of a 'universal atom' was anticipated already by the ancient Greeks: Democritus said, "there can be an atom the size of the cosmos." (Aetius, 68A47). This turns out to be a recurrent philosophical theme. In his *De magia* Bruno attributed souls and spirits to his atomistic monads, and the influence of these extended indefinitely: "[E]very soul and spirit hath a certain continuity with the spirit of the universe, so that it must be understood to exist and to be included not only there where it liveth and feeleth, but it is also by its essence and substance diffused throughout immensity. . . The power of each soul is itself somehow present afar in the universe. . ." Leibniz's monads were likewise infinitely extended (cf. *Monadology*, section 61). Into the scientific era, Michael Faraday wrote, "[T]he constitution

If all particles in my body exist, at a quantum level, everywhere in the universe, then *so do 'I'*. I am quantum-level-entangled with everything that is.[15] The fullest, most complete description of me – my body, and my mind – must include, literally, the state of the universe. And on the dual-aspect hylonoism thesis, in conjunction with my physical state there exists a correspondingly complex mental state. Thus, my mind is now a function of not just the brain, body, or environment, but literally the entire universe. Putting things poetically we might say: *the world is my body, and the world is my mind*. In a strange way, each of us is a world-soul. Such a view makes both scientific and metaphysical sense, in a naturalistic and monistic cosmos.

So there are in fact two distinct senses in which this strong holism, or panrelationalism, holds. On the internal, quantum subatomic level, the constituent elements of my body extend out indefinitely far. The components of my body, and hence my body itself, reach out to infinity. Secondly, objects outside my body, external to me, interact with me directly via fundamental forces. Hence, from both within and without, so to speak, I am universally extended.

To recap, then: As a first order approximation, my mind is given by my overall neural state. This suffices to give the broad outlines of my consciousness. To a second order, my mind is my brain state – which itself includes progressive levels of refinement, at the levels of synapses, neurotransmitters, proteins, and so on. To a third order, it is the state of my body. To a yet higher order, it is the state of my immediate surroundings – my social and physical environment. To an infinite order, in its fullest depth, it is the state of the cosmos. The hierarchy of physical structure that is my body gives rise to a correspondingly complex hierarchy of mind.

Clark (1997) refers to his own form of externalism as 'radical,' simply because it is active – versus the normal passive externalism of Putnam or Burge. The view offered here clearly exceeds Clark's. I would suggest that it is something approaching a hyper-externalism – a kind of universal extensionist theory of mind.

To complete this preliminary picture, I cite the obvious fact that the human organism has no special ontological standing with respect to this extended physical/mental nature. Hence the above analysis has two broad generalizations. First, every material object is in continuous contact with every other – via exchange of photons, gravitons, and other fundamental forces. Regarding the *fact* of universal interaction, *distance does not matter*. Distance only weakens the intensity of interaction; it does not eliminate it.

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of matter would seem to involve necessarily the conclusion that matter fills all space... [M]atter is not merely mutually penetrable, but each atom extends, so to say, throughout the whole of the solar system, yet always retaining its own centre of force." (1839–55: 293). Haldane (1934: 89) observed that "the De Broglie waves of any particle are supposed to be omnipresent." Even Teilhard (1959: 45) commented that, on the standard view, "the volume of each [atom] is the volume of the universe."

15. There is another, technical sense of 'entanglement' in the quantum world, one which results in nonlocal phenomena. I do not mean to imply this form necessarily, although I do not rule it out.

Additionally, each thing itself is likewise extended throughout all of space. The quanta, the ultimates of physical existence, are universally extended, and thus is every object or system composed of them. Each is connected to, and interpenetrates, the other. Again, this counterintuitive view was anticipated by the Greeks; Anaxagoras famously wrote, "In everything there is a portion of everything."[16] And the broader implications were taken up in earnest by Leibniz – the interconnectedness of all things, each as complex and ordered as the universe itself.

Second, each thing possesses a corresponding mind space, and hence a mental life, as it were. The complexity or depth of such mind is driven by the internal hierarchy of structure. For each object there exists a top-level structure that serves as the conscious peak of subjectivity. Lesser internal structure is indicative of less mental depth and subtlety. But this bears no relationship to sheer mass. An 80 kg rock has as much matter as an 80 kg person; but its internal complexity and dynamism is far lower, and thus its mental life must be far shallower and coarser.

7. Thoughts on panrelationalism

This sort of universal interconnectedness is my reading of panrelationalism. It is not far from Whitehead's (1941: 687) view: "There is no such mode of ['independent'] existence; every entity is only to be understood in terms of the way in which it is interwoven with the rest of the Universe." Things stand in relation, and things *are* relations. The bimodal nature of relations thus has two dimensions. Externally, the state of each thing is a function of the state of all things. Every change in the universe affects every object, though the vast majority of such changes are incredibly subtle and functionally immeasurable. Internally, as a bundle of relations (and relations of relations), each thing exhibits a lesser or greater degree of physical complexity and hierarchical structure.

Externally, we all are on equal footing. Each thing stands in relation to all, in an essentially democratic manner. In this sense a kind of cosmic egalitarianism reigns. We all stand in relation to the whole, but, importantly, none shares the same perspective – the same collectivity of relations – with any other. We each have a different outlook on the universe and thus embody a unique set of external relations. So each is alike in possessing relations to all, but each is unique in its particular collection of relations.

Internally, each thing is utterly unique. No two objects embody the same parts, nor the same set of relations to their parts. And given the hierarchy of parts-within-parts, each embodies a different degree of hierarchical complexity. Some are richly complex, with sensitive and highly dynamic subsystems; others are simpler and more rigid. The former embody a relatively deep set of internal relations; the latter, a relatively shallow one.

16. Simplicius, *Commentary on Aristotle's Physics*, 59B11.

Furthermore, relations are inherently dynamic. There is no such thing as a static relation between things. All relations involve dynamic exchange of energy, and each relationship involves continuous change in the participants. In this sense panrelationalism is a form of process philosophy; time and change are central features of the ontology of the world.

What about the boundaries of things? If objects extend throughout a network of internal and external relations, then something seems to happen at the transition between these two realms. They are continuous with one another, and yet a marked distinction occurs. At the macro-level, at least, ordinary things seem to possess clear boundaries. We know this is largely an illusion, but still, something *does* change between these two categories of relations.

One way to think of this transition is as analogous to an inflection point – a change in the curvature of relations, if you will. Inside a thing – inside myself, say – the bundle of relations curves back on itself, cohering, persisting. Outside a thing, the bundle curves away from itself, becoming progressively fainter and less consequential. The picture is something like a Gaussian (bell) curve, which is curved downward in the vicinity of its peak and upward in its tails. An inflection point demarcates the transition between the two regions. So too each thing, and each of us, exists rather like a bell curve – intense existence in a certain confined region of space, but with 'tails' that extend outwards to infinity. Between the two sets of relations exists a kind of 'event horizon' – a *relational horizon* – that marks the boundary of the thing. The relational horizon is the surface of inflection. It appears to us as the limit of the object, but in fact marks a transition in the continuity of relations, from inward to outward, from inner-curvature to outer-curvature.

What can we know, then, of the internal relations of other objects? Harman (2005) argues that the interiors of things are impenetrable and inexhaustible. Interiors recede from contact, he says, and stand in pure isolation from the world. If this were not the case, all would be revealed and there would be no principle of dynamism to the world; it would, in a sense, simply die for lack of mystery.

But the view here is different. Objects are nothing more than the totality of their (exterior and interior) relations. Yes, objects are inexhaustible, but not because they have an unlimited and untouchable interior. Rather, it is because they have an *inexhaustible exterior*; things are as wide and deep as the universe itself. On two levels, in fact: externally, due to the universal interaction between all things, no matter the distance between them; and internally, due to the extended quantum nature of ultimate particles. Things *are* the universe, and thus any representation is necessarily incomplete.

One further point: A panrelationalist approach also offers a way to address the longstanding problem of aggregates, which also points to a functional definition of an 'object.' At least since the time of Democritus there has been a debate regarding the distinction between things that are loose collections or aggregates, and those that are tightly-integrated objects in themselves. For Democritus himself, there were no true macro-objects at all; every individual thing, from a stone to a person to the sun, was only a unity "by convention" (*nomos*). The reality of things was their atomic nature, not their nominal unity. But for most thinkers such a view poses insuperable problems, especially with respect to the mind. Some – most notably, Bruno, Leibniz, and the process philosophers – have thus made a distinction between mere aggregates and true individuals. By the former they mean not only things like a pile of sand, a set of chairs, a flock of birds, or a marching band, but also even apparently 'solid' things like a rock or a coin. Aggregates, they say, possess no unified mind, even though their components (atoms) may do so. On the other hand, tightly-bound things – those which Leibniz said have "a thoroughly indivisible and naturally indestructible being" – are the true objects, and the true possessors of individual mind.

But the problem, of course, is that the intensity of binding is a variable entity. How tightly bound do the parts of an object have to be, for it to have a 'thoroughly indivisible' sense of unity? Leibniz had no good answer. Hartshorne argued for inclusion of atoms, molecules, individual cells, and animals (but not plants) in the 'true individual' category – but he never offered a satisfactory justification. In retrospect this whole distinction seems entirely contrived, in order to exclude the 'obviously' unminded things like tables, chairs, and piles of sand.

I say, follow through consistently on the thesis of panrelationalism. *All collections are objects*, but each is held together by varying degrees of intensity, and with a varying hierarchy of internal relations. The things around us that we commonly see as objects are in fact collections that are particularly tightly bound, compared to the surrounding environment. They are relatively persistent and durable. Others, like the set of chairs in my room, are very weakly bound, and hence form only a weakly-existent object. Furthermore it is very temporal in nature, changing every time I move a chair from here to there. Ultimately, every permutation of objects must also be an object – including such obscure objects as the set composed of my tea cup, the Eiffel Tower, and Saturn. It is a very, very weakly-composed object, to be sure; but these three parts nonetheless *stand in relation* to one another. Empirically, such an object may be utterly irrelevant; but rationally, it is invaluable – it testifies to the consistency of panrelationalism. This is perhaps an unintuitive notion of an object, but it is a clear consequence of the theory. If all collections of objects are themselves objects, so be it.

And finally, what about the panrelational mind? The central point is this: all collections are objects, and all objects possess their own individual mind. Depending on the degree of coherence of the object, such mind may be intense and focused, or it may be faint, or it may be utterly imperceptible – but it cannot fail to exist. Even as we are surrounded by and embedded in objects of varying degrees of intensity, so are we surrounded by and embedded in varying degrees of mind.

Since the interconnected nature of things exists both internally and externally, there must be counterparts in the realm of mind. We can say, then, that all mind has both *breadth* and *depth*. Breadth of mind is determined by its external relations, which, for every object, extend throughout the universe. So in a sense the breadth of each mind is the same – each mind is as wide as the cosmos itself. But depth of mind is a function of the internal complexity of relations, and this varies dramatically between objects. It varies with mass, of course, but also with hierarchical structure, complexity, and dynamism.

The central fact, however, is that both the breadth and depth of mind are entirely dependent upon the collectivity of relations. And *each relation* – whether internal or external – is a *mind-involving phenomenon*, even as it is also a physical phenomenon. Each is an *experiential* relation: the subject of a given experience. Relations constitute mind, by contributing a share of experientiality.

Things are the universe. And if things are the universe – the universe of relations – then so is mind. Our mind, and the mind of all things, is as deep and wide as the cosmos itself. And yet we can only fathom the luminous upper layers. The inner depth of things varies tremendously, but mind exists for all, even the simplest and least complex.

Regardless of complexity, all mind possesses an uppermost layer. We call this 'consciousness,' but something analogous exists for all things. Consciousness is the shimmering surface of the sea upon which the sunlight falls – and it falls on all things, no matter their depth. This surface is what we see when we contemplate our own minds. Yet beneath the scintillating waves lies a mind as boundless as the universe itself. No wonder, then, that we have grasped so little of its nature.

Eight hundred years ago Dogen wrote: "mind is no other than mountains and rivers and the great wide Earth, the sun and moon and stars." Perhaps in another eight hundred years we will truly understand what this means.

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