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Aliveness

If you were searching the temperate forests of northern Europe or Japan for intelligent life, it is worth noting that one very ancient, yet clever form of life, will be largely out of sight.

Look down from the canopy, where the birds sing in defence of their territory, or work constantly to feed their young. Disregard the lower branches on which clever mammals like squirrels bound and hustle. Ignore the rodents nipping in and out of cover, or even the occasional bear shuffling through the fallen leaves. Forget too about the teeming insect life that animates the forest floor, and ensures that nothing it produces ever goes to waste.

There is an intelligent life-form that thrives in the damp and shady spots, attaching itself to fallen branches and organic leftovers. It is an unappetising yellow ooze called *Physarum polycephalum*, the “Sponge Bob” slime mould. While it is easily overlooked in its natural environment, given space, a slime mould colony can spread to a metre in diameter in a lab, before drying out to resemble the veiny leftovers of an omelette stuck to a frying pan. In this dehydrated state, it can remain dormant for up to two years, then spring back to life with the addition of a little water.

Until the 21st century, slime mould would only have been of interest to the most committed botanists, those dedicated souls who had found their niche studying the most primitive forms of life. And primitive is most definitely the word here.

Slime mould appeared some 600 million years ago,¹ in the period just before high atmospheric oxygen levels led to the Cambrian explosion, and life finally made its way out of the oceans and onto the land.

Given its early appearance in the evolutionary story, long before the complex neural scaffolding of the human brain emerged, when a blob of slime mould makes its way along a rotting log, its success or otherwise in finding suitable conditions to thrive might appear to be only a matter of chance. We certainly would not expect there to be any real *agency* or intention on its part.

Whether taken as individuals, or a colony of unicellular organisms, slime mould lacks any neurons or anything we might recognise as a brain. It has no central nervous system or sensory organs. However, since the early 2000s, studies have shown that slime mould is remarkably smart. Its abilities include: navigating mazes; weighing up its options; a capacity to learn and pass on that learning; an awareness of time; and being very finicky about its diet. Although I will describe these abilities in more detail in Chapter 3, it is worth giving a mention here to slime mould's party trick—mapping out the Tokyo area transport network more quickly than a team of experienced urban planners!

Slime mould is not the only non-animal intelligence that has been impressing scientists lately. Evidence shows that trees thrive when supported by a healthy layer of mycorrhizal fungi, which take in carbon from plant roots in exchange for phosphorus, forming a relationship that is perhaps more akin to free-market trading than symbiotic dependency. We also know that plants send out warnings of danger to others in their vicinity, and are more likely to help plants that are their relatives. In the last decade, a picture has been building up of plants and fungi that are more aware of, and responsive to their conditions than was long assumed.

Even so, these newly understood behaviours are still generally considered to be the product of automated biological algorithms, rather than being a form of intelligence per se. This is partly because plants are not mobile like us, but *sessile*. It is difficult for us to attribute decision making, or consider possible intent, in forms of life that are not free to move. Yet despite having far less complex biology than the majority of plant life, slime mould can move 1cm per day, accelerating to 4cm when hungry. From its movement we know it is exploring its surroundings, weighing up its options, making choices, and sometimes overcoming its apprehensions. In this sense, the slime mould seems to have found reasons to go where it is going.

Slime mould experiments are part of a growing body of evidence that shows we have greatly underestimated the non-human forms of life with which we share this increasingly wounded planet. While environmental damage, mass poverty and war are by any sensible reckoning humanity's greatest failings, it is also notable that we still lack a secular answer to this basic metaphysical question: our bodies contain the same atoms and energy as the rocks, soil and mountains and nothing more, yet they are apparently aware of nothing. Whereas we are aware of all this, of our own existence, and so much more besides. How is that possible?

I believe the growing evidence of wider awareness and decision making in the simpler forms of life should cause a proper re-assessment of our concept of living intelligence among both philosophers and scientists. However, when philosophy does address this issue it tends to focus on the neuroscience of human experience, consciousness in the abstract, or the potential for consciousness through artificial intelligence (AI). In truth, it has yet to address the rapidly emerging scientific consensus that the human species' sophisticated awareness is not an evolutionary outlier at all.

To the question of how mind and matter are linked, the mind/body question, there are broadly four possible answers. These sit on a continuum with mind at one end, and body at the other. There is one philosophical view at either end of this continuum, and two more in the middle.

One of the answers in the middle is dualism, the idea that the mind and body are separate but complementary things. It is often said that most people are dualist by default, as dualism seems to resonate with our daily lives. We are frequently defined by competing opposites. Do you want tea or coffee? Prefer cats or dogs? Vote conservative or liberal? Arts and sciences are taught in separate classes for separate assessment. We weigh up our long-term interests against more immediate wants. The majority of our cells are replaced every few years, yet we experience life through a constant sense of self that inhabits these ever-changing bodies. There are formless objects in our heads (concepts) and corresponding objects in the real world, which are two different but apparently related things. These separate realms of physical and mental somehow meet in the brain to produce human consciousness.

But when we consider dualism as a description of a more fundamental reality, this supposedly “common sense” view is easily undermined. For example, modern science can detect only matter and energy, not some additional property of mind, so how can we prove mind even *exists*? Dualists also cannot explain where and how these separate spheres would actually meet.

Dualism came to us from Greek philosophers like Plato, then via René Descartes and the Enlightenment. From the Enlightenment onwards, as the physical sciences notched-up more and more wins, some thinkers believed the rational mind was our gift from God, and as such would be the source of human salvation. But as modern science does not need to include God or a soul in its description of what makes us human, first the soul, and then the mind and its subjective experience, was somewhat downgraded in the second half of

the 20th century. As a result, the dualism of the Enlightenment has been replaced by the philosophical view behind most modern science: materialism or physicalism.

These belong firmly at the *body* end of the continuum, because they rank mind as secondary to matter, stating that mind cannot exist without the physicality of the matter and energy that make up the rocks, trees, stars, and the rest of the cosmos. On the other hand, according to materialism, matter can most *definitely* exist without mind, and does so throughout the vast majority of the universe. Living beings like us are the rare exception in a universe made almost exclusively of unknowing matter. For the most ardent materialists, the consciousness through which I am writing and you are reading, is simply a by-product of the human brain, like the hum of the cooling fan produced by the computer that sits on my desk.

The third approach is at the other end of the continuum from the *all is matter* approach of materialism and physicalism. It is the largely impractical *all is mind* approach found in the philosophy of idealism. Idealists counter that because we can only know of matter *through* our minds, matter is ultimately dependent on mind, and cannot exist without it. This means that the tree falling in the forest really does not make a sound unless there is someone, or something, around that is capable of perceiving it.

Undoubtedly, most of us have more pressing things to do than explore these abstract questions in depth. Even so, I suspect you would have some idea where you are on the metaphysical scale I have just described.

There is, of course, an alternative to the three philosophical positions outlined above. For as long as I can remember, I have always assumed that whatever enables conscious beings like us to exist is most likely a basic attribute of *all* the matter and energy that surrounds us—meaning that mind, matter and energy really are all the same stuff, none of

which should take precedence over the others. Yet I am still surprised how unusual, even exotic, a philosophical position this is considered to be. This is sometimes even the case for those used to dealing with highly abstract concepts, or those well-versed in ancient spiritual traditions. For me it has always been the most common-sense philosophical position of all.

The apparent exoticism of this position may come from its association with religious or mystical experience, represented for example, by the Buddhist saying, *you are the universe experiencing itself*.

I believe another reason awareness as a property of everything seems remote and mysterious, is that the correct philosophical term for what I have described is panpsychism; *pan* giving us everywhere, and *psychism* knowing.

Although there are different flavours of panpsychism, such as panexperientialism and pantheism, which I will touch on in Chapter 5, it essentially comes down to the idea that there is some element of mind in all things. As the Stanford Encyclopedia of Philosophy says:

Panpsychism is the view that mentality is fundamental and ubiquitous in the natural world.²

Sharing this view means I am not dualist, idealist or materialist by default, but panpsychist by default. However, while this book is essentially arguing for a type of panpsychism, I tend to avoid this philosophical label, and will mostly refer to the idea of there being *an element of mind in all things*, instead. In practice this means we live in an intelligent and *aware* universe. But this book is not singing the praises of panpsychism, and there is a good reason for that!

I am fully at home with the idea that every nook and cranny of the universe, everything we know about and everything we have yet to discover, may in some sense be described as potentially aware, intelligent and capable of

knowing. Despite this, I have a nagging feeling that the word *panpsychism* will create unhelpful associations for anyone who might otherwise be persuaded that this is a rational position to hold, rather than a belief system for mystics, the chronically naive, and assorted oddballs!

No matter how many times I type those eleven characters in that order, I cannot shake the feeling that the word panpsychism suggests Ouija boards, tree spirits or telekinesis to many, and I am convinced by none of these. While this book is making a case for there being some element of mind in all matter, as a way of accounting for the existence of living consciousness, it does not require the reader to be religious, or to subscribe to any New Age suspensions of disbelief.

So why aren't more thinkers on-board the panpsychic train? As a philosophical idea it has many upsides. For instance, panpsychism quickly dispenses with the mind/body unification problem that plagues dualism. After all, we can account for consciousness in the individual by stating the whole universe is aware, so any point in the universe is also aware and the problem is solved, right? Unlike idealism, it also gives matter its proper status, making it compatible with modern science. Panpsychism is also a plastic enough concept to suit both the devoutly religious and the committed atheist, because it works with or without a deity. It even offers a novel way to account for the frequently counter-intuitive observations found in the bizarre realm of quantum physics, which has long challenged conventional understanding.

Apart from the name, the other major barrier for anyone arguing that all things contain some element of mind is that it could seem to imply that *everything is conscious*—as if we could take the properties of the human mind and scale these down to the smallest level. This is something of a chicken-and-egg problem, because our concept of intelligent consciousness is largely shaped by our concept of the human mind.

For an intelligent, aware universe to be credible, a significant shift in our understanding of what it means to be human, and a recognition that our species may not be evolution's crowning achievement, is needed. This is a hard habit to break, because due to our monotheist religions, and then secular science, we humans have had a tendency to place ourselves at the top of the pyramid, relegating the rest of nature to being the background scenery for the all-important story of human destiny.

I believe that this subjective, sometimes brilliant, sometimes deeply flawed thing called human consciousness, may just be a subset of awareness in a universe that is at its most basic level, aware, creative and able, in visible ways, to make decisions.

The relative consciousness of species is not then a hierarchy of intelligent and aware beings, with humans at the top, with the most enlightened point of view in the universe. It is more like a Venn diagram where the consciousness of species overlaps, and human consciousness is only one *form* of awareness.

But this is not animism or vitalism. Today, no scientist looks for a special substance to breathe life into apparently lifeless atoms, like the spark that animated Frankenstein's monster. The Victorian concept of vitalism is as quaint and ludicrous as a phrenologist devising the profile of a cold-blooded killer by measuring the skulls of inmates in an asylum. However, as artificial intelligence is becoming ever more sophisticated, the question arises whether human inventions might spontaneously become conscious? There are even serious ethical debates about whether robots may deserve rights. These questions arise despite humans being unable to provide a secular explanation for the origin of consciousness in the natural world—a natural world we have been transforming at a rate that is both impressive and alarming.

The fact is, despite science transforming every aspect of our lives, something is still missing from modern science's description of the world. While it can account for the processes seen in the natural world using evolution, biochemistry and mathematics, it has yet to answer this fundamental question: if *all* is matter and energy, how does a carbon atom from a rock, which finds its way into the food chain and then into the tissue of the human brain, play a part in the conscious experience that you and I are having right now?

This unanswered question of how mind can emerge from energy and matter alone was how the materialist scientist Dr Jim Al-Khalili concluded his fascinating 2008 BBC series *Atom*,³ which is a reflection of the fact that most scientists believe this problem is still unresolved.

As atoms are un-aware, un-knowing and un-feeling, there is always going to be a problem of *radical emergence*, a question of how and when those atoms manage to switch themselves "on" in our brains to create a conscious human being, capable of experiencing the world? At what point do we draw a distinction between the conscious and the completely unaware? Materialist science seems to allow something (consciousness) to just appear out of nothing (unaware matter), which is a rather unscientific notion.

Strict materialists will, or course, vigorously dispute that there is a radical emergence problem at all, often arguing that the human brain generating consciousness is rather like arranging metal, glass, and gas into the form of a light bulb and adding electricity to produce light. They would say, we just need a bit more information from neuroscience to fill the gaps and understand exactly how this works.

However, that light bulb analogy has limited value, not least because light exists without light bulbs! While a light bulb needs to be constructed properly to produce light, it can only produce particular forms of light, and light bulbs are one of

many sources of light found in our universe. In a similar way, maybe it does not require the complex biological machinery of an animal brain to produce intelligent awareness? Maybe awareness, an element of mind, is already built-in and inseparable from matter?

Oddly enough, idealism, the notion that everything is dependent on mind, is perhaps attempting a comeback on the frontiers of science, as I will describe in Chapter 4. This impractical approach seems to be preferred to a philosophy that identifies mind and matter as potentially the same stuff. It seems the idea that all things have *aliveness*, because they contain some element of mind, remains in the metaphysical “maybe” pile for now. It is still very much an outlier, because apart from those who are used to debating philosophy of mind in academia, the word panpsychism, and its apparent plasticity, makes it seem esoteric, vague or elusive to many. To others it sounds downright ridiculous.

In arguing there may indeed be an element of mind in all things, this book has three main strands. First, what does the current research on the natural world reveal to be the differences and similarities between our mental lives and those of other species, and what does this tell us about the true status of human consciousness within nature?

Second, what is science finding that might suggest there is mind in more basic biology, and at the smallest scales? And what connection might there be between the sub-atomic world and human consciousness and neurology?

Third, how have philosophy, language and human belief systems created a culture that has separated humans from the rest of the natural world, and through the myth of human *exceptionalism* placed human conscious experience in its own special bubble?

I should state here that, this book does not contain any slam-dunk pieces of evidence for mind in all things. There are

no messages of profound insight from ancient texts, or any brilliant examples of deductive reasoning that lead us to an unavoidable conclusion. There are no Zen koans that temporarily suspend the analytic mind, in order to trigger a moment of pure understanding in the reader. Neither is this an especially spiritual book, as it aims to engage the mind more than the spirit. However, it is also important to remember that awareness everywhere is a view found in many of the world's oldest spiritual traditions. In this sense, this book is only giving an updated take on a very old and simple notion.

What this book shares with the mystics is a belief that there is a vibrancy and, for want of a better word, an *aliveness* to all things. Aliveness is, of course, different from the biologists' definition of life, which categorises the majority of matter in our universe as not living. But as I will discuss in Chapter 8, this *aliveness* is something mystics often experience. For the mystic, it usually goes with a sense of being liberated from their life history and current identity, and a perception of their existence as a temporary manifestation of life in a fundamentally living universe.

However, this does not mean the reader must seek out mystical experience to grasp the concept of mind in all things. It can certainly be understood through reason, backed up by empirical evidence.

To this end, this book presents scientific research, which is mostly very recent, and examines the structures of understanding we have inherited through science, philosophy and culture, that tend to make the idea of aliveness—of mind in all things—seem remote, strange or exotic. I am also flagging what I believe to be the inherited biases and blind spots, that for centuries have led us to believe such a thing is either mysterious or impractical. By this I mean, the argument in this book is as much one of subtraction as it is addition.

1. Heidel, Lawal, Felder et al. 'Phylogeny-wide analysis of social amoeba genomes highlights ancient origins for complex intercellular communication'. *Genome Research*. 2011. 21:1882-1891.
2. Goff, Philip; Seager, William; Allen-Hermanson, Sean, "Panpsychism", *The Stanford Encyclopedia of Philosophy (Spring 2024 Edition)*, Edward N. Zalta & Uri Nodelman (eds.). <https://plato.stanford.edu/archives/spr2024/entries/panpsychism/>.
3. End of the final episode, 'The illusion of reality'.