

J3: At Home with Infinity

I started with May Sinclair, my short story. It made me think of Mandelbrot and fractals, and I encountered Idealistic Monism; I have roamed very far across philosophical fields and have compressed this into a see-saw between embodied reality, shared experience, and paradoxically the boundless, indefinite and unknowingness of life it engenders; and reality perceived as representation, where the authority of experience emanates from self, supporting the cult of the individual and separating our consciousness from the external world. This can be seen as a division of the brain itself, a war between the right and left hemispheres, as argued by Iain McGilchrist in *The Master and the Emissary*, a book which has helped me make sense of the world.

I have had to leave out stories (in March 1917 a modernist painter George Biddle hired a 42-year old German woman as a model. When she threw open her coat, she was nude apart from a bra made from two tomato cans and green string, a small birdcage housing a despondent canary, and a large number of curtain rings recently stolen - Baroness Elsa). I also wanted to shoehorn in: 'The strange attractor lives in phase space...' (a feature of chaos theory) but this lonely character I will write about separately.

Location: Ancient Greece 6th century BC

Olive groves, the parched landscape, the blue, blue, blue of the Aegean sea...

Anaximander, a pre-Socratic philosopher developed the concept of *apeiron*, the unlimited, boundless, infinite, or indefinite. It has neither beginning or end, and therefore is an endless source, from which things eternally arise and to which they eternally return, forever in process....

'...Full sail, I voyage

Over the boundless ocean, and I tell you

Nothing is permanent in all the world

All things are fluid; every image forms,

Wandering through change. Time itself is a river

In constant movement, and the hours flow by

Like water, wave on wave, pursued, pursuing,

Forever fugitive, forever new.

That which has been, is not; that which was not,

Begins to be; motion and moment always

In process of renewal...

Nothing remains the same; the great renewer,

Nature, makes form from form, and oh, believe, me,

That nothing ever dies...' Ovid, *Metamorphoses*

Central to the idea of *apeiron* is that it must be able to contain within itself, without their mutual annihilation, all opposing principles.

Heraclitus took on Anaximander's ideas and developed them; he was 'the first writer to feature the new concept of the soul' (*Bruno Snell*), and in speaking of its depth was drawing on concepts such as 'deep knowledge', 'deep thinking', 'deep pondering'... the symbol of depth points to the infinity of the intellectual and spiritual, which differentiates it from the physical.

'We are rebuffed by the two dimensionality of the plane that stands some distance from us, without depth, a two-dimensional world in which we can no longer stand alongside what becomes the 'object' of our vision (we lose our relational dynamic with it). Depth is of great psychological significance'. *Iain McGilchrist, The Master and the Emissary*

Heraclitus did not advise a turning inwards to discover the nature of reality, but a patient and careful attention to the phenomenal world. *Logos*, the ultimate reason, cause, meaning or deep structure of the world, is evidenced in reasoned thought, in turn *informed by experience*.

This philosophy is fundamental to our ability to share embodied experience as also a shared truth; it extends outwards and encompasses the world as a whole, rather than as fragmented and uncertain particles. This connection with something broader and deeper than self doesn't annihilate the individuality of self, but grounds it.

' truth is mediated by embodied understanding and imagination. This does not mean that truth is purely subjective or that there is no stable truth. Rather, our common embodiment allows for common, stable truths.' *Lakoff & Johnson*

Hidden structure is superior to manifest structure:

...'men who love wisdom, must be good enquirers into many things indeed for Nature loves to hide...one could not reach the ends of the soul though one travelled every day, so deep is its measure...the symbol of death always points to the infinity of the intellectual and spiritual, which differentiates it from the physical.' *Heraclitus*

...'that, in the shadowless atmosphere/The knowledge of things lay round by unperceived...'
Wallace Stevens

Lovers and poets and painters and musicians and mystics and heroes know them:... moments when things that we have seen all our lives without truly seeing them...change to us in an instant of time, and show the secret and imperishable life they harbour ...; moments of danger that are sure and perfect happiness, because then the adorable Reality gives itself to our very sight and touch. *May Sinclair A Defense of Idealism* .

If we attend to embodied experience, we encounter, according to Heraclitus, the reality of the union of opposites; opposites defining each other and bringing each into existence. 'The name of the bow is life; its work is death.'

Opposites are always under tension; the string stretched taut from opposing forces is an expression of dynamic equilibrium; and this creates life not despite, but *because*, they pull in opposite directions.

Location: Los Alamos, New Mexico, 1970's

Ringed by mountains, Los Alamos is recognised as the development and creation place of the atomic bomb during World War II. It was where Mitchell Feigenbaum, a physicist, discovered universality and created a theory to explain it. 'Simple systems give rise to complex behaviour. Complex systems

give rise to simple behaviour. And most important, the laws of complexity hold universally, caring not at all for the details of a system's constituent atoms.' *James Gleik, Chaos*

In this universality we can see the world again as a whole entity, working within dynamical systems that are forever in process, *apeiron*. It is a glimpse into the hidden structure underlying natural laws that illuminates, but does not reduce, control, or enable mastering through science or technology – in knowing this, it reflects the unknowingness of the world.

'Try and penetrate within our limited means the secrets of nature, and you will find that, behind all the discernible laws and connections, there remains something subtle, intangible, and inexplicable. Veneration for this force beyond anything I can comprehend is my religion. To that extent I am, in fact, religious.' *Einstein*

'I can at times feel strongly the beauties, you describe, in themselves, & for themselves – (sometimes) I can contemplate nothing but parts, & parts are all little! – My mind feels as if it ached to behold & know something great – something one and indivisible – and it is only in the faith of this that rocks or waterfalls, mountains or caverns give me a sense of sublimity or majesty! But in this faith *all things* counterfeit infinity!' *Coleridge*

Location: Mandelbrot's Set

A fractal is a way of visualising infinity. Fractals were discovered in 1979 by Benoit Mandelbrot, a magpie-minded mathematician. He wanted to create a visual representation of a simple equation, involving just multiplication and addition; he iterated the equation for every pixel on his computer display. The outcome would either become increasingly small, heading down towards zero, which Mandelbrot would mark black. Or it would become huge and race off towards infinity, in which case that pixel would be coloured. The choice of colour varied according to the speed of the increase.

The result was an appealing black shape on the screen with coloured frilly edges. It wasn't a shape seen before, but one that felt strangely familiar. Looked at closely, the edges of the shape weren't smooth. The more you delved in, the more you found, the patterns kept coming. There were tiny versions of the initial shape hidden deep inside itself. But the patterns did not repeat *exactly*. And the images resembled the natural world of leaves, rivers, or snowflakes. Mandelbrot had discovered infinite complexity hidden in one short equation.

'Our feeling for beauty is inspired by the harmonious arrangement of order and disorder as it occurs in natural objects – in clouds, trees, mountain ranges, or snow crystals. The shapes of all these are dynamical processes jelled into physical forms, and particular combinations of order and disorder are typical for them.' Gert Eilenberger, physicist

'Fractal basin boundaries addressed deep issues in theoretical physics. Phase transitions were matters of thresholds, and Peitgen and Richter looked at one of the best-studied kinds of phase transitions, magnetization and non-magnetization in materials. Their pictures of such boundaries displayed the peculiarly beautiful complexity that was coming to seem so natural, cauliflower shapes with progressively more tangled knobs and furrows. As they varied the parameters and increased their magnification of details, one picture seemed more and more random, until suddenly, unexpectedly, deep in the heart of a bewildering region, appeared a familiar oblate form, studded with buds: the Mandelbrot set, every tendril and every atom in place. It was another signpost of universality. 'Perhaps we should believe in magic' they wrote.' *James Gleik, Chaos*

Location: The Brain

'In the left-hemisphere situation, it prioritises the system, regardless of experience: it stays within the system of signs. Truth, for it, is coherence, because for it there is no world beyond, no Other, nothing outside the mind, to correspond with. 'That's what it says here'. So it corresponds with itself: in other words it coheres.

The right hemisphere prioritises what it learns from experience: the real state of existing things 'out there'. For the right hemisphere, truth is not mere coherence, but correspondence with something other than itself. Truth, for it, is understood in the sense of being 'true' to something, faithfulness to whatever it is that exists apart from ourselves. ' *Iain McGilchrist, The Master and the Emissary*

Location: Back to Ancient Greece again

Plato's doctrine of the eternal Forms gives priority to the unchanging categorical archetype; what is conceptual becomes real, and what is experienced, at least by the senses, is reduced in significance, and even becomes the representation.

'The stars that decorate the sky, though we rightly regard them as the finest and most perfect of visible things, are far inferior, just because they are visible, to the true realities, that is, to the true relative velocities, in pure numbers and perfect figures, of the orbits and what they carry in them, which are perceptible to reason and thought but not visible to the eye...we shall therefore treat astronomy, like geometry, as setting us problems for solution, and ignore the visible heavens, if we want to make a genuine study of the subject.' *Plato*

Representation (referencing only authority inside our heads), as distinct from the reality of a world experienced through embodiment, (outside our heads) embeds itself in the history of Western philosophy for the subsequent two thousand years, and dominates current psychological thinking and social models. It has also set in motion some of the most problematic aspect of modernity, the cult of the autonomous individual, together with radical self-responsibility that relocates the standards for truth inside ourselves.

'...There is a problem of mental fragmentation and arbitrariness that results when our contact with the world is mediated by representations; representations collapse the basic axis of proximity and distance by which an embodied being orients in the world and draws a horizon of relevance around itself. ' *Matthew Crawford, The World Outside Your Head*

Location: The Enlightenment

John Locke, English philosopher, was regarded as one of the foremost of 17thC Enlightenment thinkers, influencing Kant among others, and commonly known as the father of Liberalism. Locke paved the way to modern conceptions of identity and the self. His main driver was the necessity to assert freedom against coercive power; the ultimate continuum of this was to assert one's own reason as the ultimate authority, rejecting external authority that has not been legitimised by consent. The notion of the liberal self is deeply connected to the notion of freedom. But Locke's theory referenced a mythical moment with no existing society or context, his *tabula rasa* world reflecting his belief that at birth, the mind was a blank state. This is a hypothetical, not actual freedom, we do not come into a blank world. Following Descartes, he calls on us to be free from any influence not derived from intellectual independence ' The floating of other Mens Opinions in our brains makes us not a jot more knowing, though they happen to be true'. And this means that truth is no longer found out in the world, but is a function of our mental procedures. This view of the sovereignty of the individual, together with the assumption that *representation* is the fundamental

way we apprehend this world, has formed in a large part our current moral, political and cultural order.

Location: The Age of Aquarius

Representation amounts to **‘a projection of thingness which, as it were, skips over the things’**

Heidegger

‘The fetish of automaticity and disconnection can’t be called a tendency of ‘technology’ if we insist that the proper standards of technology are simply those of function. Rather, it is the tendency of a peculiar consumer ethic that has embraced Kant’s metaphysics of freedom. Disconnection – pressing a button to make something happen – facilitates an experience of one’s own will as something unconditioned by all those contingencies that intervene between an intention and its realisation.

...this design philosophy can be turned to especially disturbing purposes in the darker precincts of ‘affective capitalism’ where our experiences are manufactured for us....These experiences provide ...escape from the frustrations of life; they are especially attractive in a world that lacks a basic intelligibility because it seems to be ordered by vast impersonal forces that are difficult to bring within view on a first person, human scale.

...I argue that all of this tends to sculpt a certain kind of contemporary self, a fragile one whose freedom and dignity depend on its being insulated from contingency, and who tends to view technology as magic for accomplishing this. *Matthew Crawford ‘The World Beyond Your Head’*

‘Technology can’t replace embodied understanding and mastery of skill – ‘There are hundreds of examples...to which the process of mechanisation is continually adding new ones. Their losses are usually irretrievable. It is pathetic to watch the endless efforts – equipped with microscope and chemistry, with mathematics and electronics – to reproduce a single violin of the kind the half-literate Stradivari turned out as a matter of routine more than 200 years ago. ‘ Michael Polanyi, *polymath*

Location: The Future

‘One of the most troubling aspects of what could be called the futurism movement: a majority of the compelling and visible ideas about tomorrow are being conceived and developed by a tiny minority ultra-wealthy individuals and private-sector companies. It’s not hard to see the seductive appeal of these visions of the future. Beautiful digital renderings invite into glowing and highly conceptual worlds, such as Elon Musk’s plan to build a glass-domed colony on Mars, or Jeff Bezos’s plan for floating space colonies.’ *Matt Shaw, freelance writer*

‘Our own understanding of the situations we encounter is grounded in broad, intuitive “common-sense knowledge” about how the world works, and about the goals, motivations and likely behaviour of other living creatures, particularly other humans. Additionally, our understanding of the world relies on our core abilities to *generalise* what we know, to form abstract concepts, and to make analogies — in short, to flexibly adapt our concepts to new situations.

A.I. programs that lack common sense and other key aspects of human understanding are increasingly being deployed for real-world applications. While some people are worried about “superintelligent” A.I., the most dangerous aspect of A.I. systems is that we will trust them too much and give them too much autonomy while not being fully aware of their limitations. As the A.I. researcher Pedro Domingos noted in his book “The Master Algorithm,” “People worry that

computers will get too smart and take over the world, but the real problem is that they're too stupid and they've already taken over the world." *Melanie Mitchell, complex systems scientist*

'Modern society has threatened the plausibility of religious theodicies, but it has not removed the experiences that call for them....(it) has accomplished many far-reaching transformations, but it has not fundamentally changed the finitude, fragility and mortality of the human condition.' *Peter Berger, The Homeless Mind*