Time / No Time

The paradox of poetry and physics

Seán Haldane

PARMENIDES

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INTRODUCTION

Poetry and Physics

Poetry is 'making' ('poiein' in Greek) and 'seeing' (in Old Irish the word 'file' means poet and seer). Physics is about 'nature' and 'being' ('physein' in Greek). Their approaches are different: a poem is a one-off, a singular event, whereas physics requires replicability of events. The poet and the physicist see differently, and the physicist's observations are often made indirectly, via instruments. But they see the same nature.

Usually they don't take each other seriously. The 'one off' has no place in physics which by definition (Joe Rosen) consists of a deliberate research programme which looks for repeatable and replicable observations and results. Furthermore each theory in physics must be phrased in such a way that it can be tested and, if 'falsified' (Popper's term) then modified or replaced by a new one. The equivalent in a poem is its being true to the experience of the reader (which is more likely if it was true to the experience of the poet) and it may even modify the reader's experience, his or her way of seeing things. A poem is a vision. And once it is written it cannot be replicated, only copied. The vision of the poet / seer is not incorporated into physics. And since poets see for themselves it is hard to imagine a poem that relies on instruments for its observations. Poets and physicists seem to inhabit separate worlds. But they don't. They share the same world, the same nature. Although the physicist (like his or her historical predecessor the philosopher) looks for generalisable statements, the poet looks for what Blake called 'the minute particular' – again the one-off.

I would like to think that in the late 20th century physics and poetry began to converge: quantum physics explores a universe as strange as that of poetry, and like poetry it puts into question time and logic. But quantum physics seems to be a special case for matter at a very small scale, and its effects are not observable in the human-scale world – either for physicists

or poets – unless such one-off phenomena as telepathy and precognition are seen as analogous to the one-off states of sub-atomic particles. And the 'miraculous' (a miracle being by definition a one-off vision) occurrence of poems through what Robert Graves called 'more-than-coincidence' cannot be explained through physics – because it is not testable, replicable etc.

On the other hand, as Rosen has explained, a cosmological theory in physics, although it may have explanatory power and lead to further research, cannot be tested: the universe is too huge and may not even have limits. So physicists and poets are equally free to make untestable statements about such fundamentals as time. As physics since Mach questions the absoluteness of time, and sees it as relative (as poetry often does), perhaps there is some convergence after all. And the cosmological theories of Mach and Einstein are no more testable than those of the first theoretical physicist, Parmenides, who was also a poet.

Parmenides

Over 2,500 years ago the pre-Socratic philosopher Parmenides wrote a poem, of which 161 lines survive as fragments, known as *Peri Physeos*. This is usually translatable as 'On Nature' – 'physis' suggesting not simply what we now call the physical, but what appears as the result of growth and swelling, and also 'being'. Parmenides may have been the first and last person for whom poetry and physics were as one. Soon after his death they split apart, with a shove from Plato. Now with a shove from 20th century quantum physics they may be moving together again. *Peri Physeos* raises perhaps the most basic philosophical and scientific question ever posed: does change exist, or is it only an illusion? Plato, following Parmenides, thought it was an illusion. As Shelley put it, neo-platonically: 'Life is a dome of many coloured glass / Staining the bright radiance of eternity.'

Parmenides, in denying change, was also denying time. He does not mention time. But a universe without change, un-moving, cannot contain time – which is measured by change. Common sense tells us both change and time exist. But the theoretical physicist Julian Barbour in *The End of Time* (2000) separates the two in a proposal that change exists in the shape of the universe but time is an illusion. He describes a timeless universe of pure shape, 'Platonia.' Most physicists do not agree entirely with Barbour,

but they would agree that we need to re-think time (and there is an active research programme by a group of physicists who aim to explain anomalies in current physics via Barbour's theory). 'Time's arrow' moving forward into nothingness with history behind it was replaced by Einstein's 'space-time' – which then turned out to be incompatible with quantum physics. Stephen Hawking's *A Brief History of Time* sits on the fence between the Big Bang theory of the universe and the evidence against time. David Deutsch proposes a multiplicity of universes.

I am not a physicist but as a neuropsychologist I work with scientific method: I use statistics and systematic observation to make statements of probability (about for example diagnosis), and I seek further evidence to test my conclusions. Scientific method is effective and widespread because it is not very complex. Most of it consists of counting things which can then in turn be 'counted on' as evidence. As the philosopher David Stove has pointed out, 'Almost any drongo (if an Australianism can be permitted) can do "normal science"'. And Stove is not putting science down. But he is not writing about cosmological theories.

At the very least, in this book, I hope to be logical. But I have also written and published books of poems. Certainly the writing of a poem does not follow scientific method. Coleridge wrote that 'A poem is that species of composition, which is opposed to science by proposing for its *immediate* object pleasure, not truth'. But he followed this with: '*Good sense* is the *Body* of poetic genius' and 'Poetry must be more than Good Sense or it is not poetry; but it dare not be less or discrepant.'

Scientific method at the turn of the 21st century has been heavily influenced by Karl Popper who neatly refined the old distinction between induction (reasoning from accumulated observations) and theory (proposing an explanation that may be supported or refuted by observation, with refutation being the more powerful since one observation of a black swan can disprove for ever the 'fact' that all swans are white). Popper described induction as the 'bucket method' of collecting data and then claiming erroneously that the data, rather than theory, suggested a conclusion. He favoured the 'hypothetical-deductive' method in which a theory, or even a conjecture, is advanced in a way that makes it testable ('falsifiable') by observation (evidence). But scientists' accounts of their own theory-making do not always correspond to this ideal. They often

state that their theory began with an observation, or when their theory is refuted by a counter-observation they seek further observations which refute the deduction from the counter-observation.

The word 'theory' itself means in Greek ('theoreia') a way of seeing or looking at something. In itself the word betrays a connection, not an opposition, of idea and observation. Some theories are experienced by the person who formulates them as emerging from the observation or as part of it. The *way of seeing* defines what is seen and what is thought about it. Henri Borcroft has explored this in the case of Goethe whose way of seeing colour does not refute Newton's but is nevertheless valid. Borcroft sees this as 'the multiplicity of unity', which is too abstract for me, but it amounts to seeing the parts and the whole at once. The experiential choice is *not* for all observers the black and white alternative proposed by the Gestalt psychologists whose trick drawings show a black vase *or* two white faces – never both at once. Gestalt is claimed to originate with Goethe's ideas, but in my experience (and I think Goethe's) of 'seeing' many levels of meaning *at once* when writing a poem, I find it is possible to see (or experience with other senses) the parts and the whole simultaneously. Only in this way can the complexity of life be understood. Both pure inductivism and pure theory are ways of reducing life to something testable – of reducing, to return to Popper, the 'truth target.' In fact they inter-react, and this is consistent with modern physics where Newtonian mechanisms of action and reaction are replaced by interaction and relation – of the observer and the observed, for example, in quantum physics.

Poetry is *inclusive* of many levels of meaning, among them rational meaning, but it is also supra-rational. Traditionally science and logical argument must be *exclusive* of distractions and stick to a single line of thought. Conclusions (even in the form of probability statements) are more accurate if the truth target is relatively small. But the complexity of modern physics, particularly the discontinuities of quantum physics, has changed this. Whether or not physics and poetry are converging, both must accept paradox.

As I read Parmenides, he does not claim that change does not exist. He states the paradox that it cannot logically exist yet it appears to exist. This kind of paradox is the stuff of poetry. Since the arrival of quantum physics it is the stuff of physics too.

I must admit that many of my observations in this book date back to the decade of the 1970s, which the witty journalist Francis Wheen has described as 'strange days indeed' and (being 'the last pre-digital decade') the origin of an age of Mumbo Jumbo. For the record, I do *not* 'believe in' spiritualism, UFOs, spoon-bending, life energy, the Bermuda Triangle, or deconstructionism. But the decade's craziness in the absence of real innovation (after all, the moon landings had taken place in 1969, and DNA had been discovered in the 1950s) did give a general permission to explore 'anything that goes'. I do, as a poet, leave a space for miracles, and I'm willing to look at anything. But I don't believe in very much, being sceptical. And science is a matter of evidence, not belief. (Or should be: the ruling by an English court in 2009 that 'belief' in global warming has the status of religion is ominous, no matter which side of the debate you are on.) As this book shows, I think there is evidence for precognition, action at a distance or without cause, and fields of consciousness. But these may be incidentals in a timeless universe where we paradoxically experience time.

In this book I concentrate on observations, my own and those of others, which I have replicated. I discuss current cosmological theories and attempt to reconcile them with the observations. I end up with not so much a theory as a description of reality which I invite you to consider and perhaps share. I agree with Stove that 'realism is inevitable,' and I am no idealist.

More-than-coincidence

The non-existence of objective time has been creeping up on modern physics, particularly since the discoveries of relativity and the quantum physics which made a huge break-through in the first 40 years of the 20th century and turned the received world upside down. But this breakthrough was mainly suppressed in the remaining 60 years of the century. Classical physics went on mainly as if nothing had happened. In the 1950s at a school in Northern Ireland known for its scientific excellence, physics was taught to me without any reference whatsoever to the quantum theory which had emerged over 30 years before – while down the road at the Dublin Institute of Advanced Studies the great Erwin Schroedinger who had discovered

the quantum wave function was working in quiet obscurity, making waves only in his rather scandalous private life. (He had been rejected when he applied for a post at Oxford because he had two wives, but puritanical old Dublin accepted him.). Although the atom bombs had exploded 12 years earlier I was not taught about Einstein or relativity either. At least now there is an active debate on space-time, spawning academic articles and popular books, and even if many physicists hold to a classical 'arrow of time' view, this is looking more and more like a rear-guard action.

Modern physics is caught in a split. Quantum physics, where particles can disappear and reappear in different places, and 'action at a distance' can occur (even, according to its most radical exponents, changing the *past*) is simply not consistent with the 'classical physics' of space-time and the Big Bang. So there is a stand off: the 'micro' world of particles is given over to quantum physics, and the 'macro' world of the observable universe is given over to classical physics. They never meet. Quantum mechanics is supposedly not detectable in the 'macro' world.

But perhaps it is. We experience something like quantum discontinuities (though erratically and sporadically, like the micro events of quantum physics) in what we call telepathy, precognition, and other 'paranormal' events. Action at a distance at the macro level is staring us in the face. We – like the experimenter in quantum physics – seem to create at least part of the reality we experience and that also creates at least part of us. At particular moments this kind of interaction shows itself in paranormal events. Since I do not want to sign up uncritically to a belief in the paranormal (parapsychology, telepathy, ESP, psychokinesis etc.), I use the poet Graves's term 'more-than-coincidence'. As will be exemplified in this book, it occurs all around us every day.

The scientific approach to more-than-coincidence is to cast it beyond the pale, with poetry and religion. It is a rare event when an eminent physicist such as Freeman Dyson steps out of line in the *New York Review of Books* with an essay 'Debunked! ESP, Telekinesis, Other Pseudoscience'. Although necessarily cautious about 'pure speculation', Dyson invokes Niels Bohr's principle of 'complementarity' – 'that two descriptions of nature may both be valid but cannot be observed simultaneously'. Dyson concludes about the 'paranormal': 'I find it plausible that a world of mental

phenomena should exist, too fluid and evanescent to be grasped with the cumbersome tools of science' (presumably meaning the requirements of repeatable and replicable observations).

But although more-than-coincidence contains mental events it is not an entirely mental phenomenon. It includes observable events. For example Rupert Sheldrake's theory of 'morphic fields' to explain telepathy is accompanied by rigorous observations of the *behaviour* (not the unobservable thoughts) of people and animals which suggests that they communicate telepathically.

In this book I set out various procedures for the observation and recording of precognitions and 'series'. I also give examples of how poems appear to have 'the last word' in certain clusters of events. Poems express more-than-coincidence and their forms spring from the duality between biological pulsation – heartbeats and breathing – and universal pulse-waves. Here I am adapting an idea from the controversial psychiatrist and experimentalist in biophysics, Wilhelm Reich who defined life in terms of pulsation but assumed pulsation occurred throughout the universe – e.g. in 'pulsating' stars and the aurora borealis. But there is an easily observable difference between pulsation (as in the unequal phase breathing in and out or heartbeat of an animal or human) and oscillation (as in the equal phase swinging of a pendulum, the vibration of a molecule or the rippling of the aurora borealis): it is the difference between the living and the non-living.

Just as through our experience of pulsation we know time, through our experience of more-than-coincidence we know timelessness.

Physics and poetry

I examine the three universes of Hawking, Deutsch and Barbour: the Time Universe, the Multiverse, and the Shape Universe. (The first and third of these terms are my own abbreviations). All these leave consciousness (or more simply 'awareness'), either as an illusion or a 'mystery'. I propose that pulsation and more-than-coincidence enable the persistence of life against time in 'the cosmic ocean', the space-time continuum. Pulsation enables consciousness which creates time in our minds so that we feel distinct from the continuum – like jellyfish in the sea.

The cosmic ocean is both full of motion and motionless, depending on perspective. Meanwhile we get on with our lives. As Robert Graves put it in 'Midway':

> Nothing that we do
> Concerns the infinities of either scale.
> Clocks tick with our consent to our time-tables,
> Trains run between our buffers. Time and Space
> Amuse us merely with their rough-house turn,
> Their hard head-on collision in the tunnel.

Many modern physicists turn their backs on poetry as a matter of course, but also on other sciences – psychology, neuroscience, and biology – even when these emulate classical physics by being as mechanistic as possible. As Julian Barbour sees it, 21st century physics will become more biological (to include, for example, consciousness, which he sets aside as a 'mystery' in his own work). Unless biology lives up to its name and studies life – not microtomed slices of frozen tissue – it cannot contribute to a study of time. Time, the big theme of modern physics, is inseparable from life.

If mental phenomena are outside the pale of science, what Parmenides called 'double-headedness' looms. Science will take care of the physical body and the mind will be left for mumbo-jumbo or religion or 'imaginative literature.' Mental phenomena then become like God, early in the 20th century, elbowed aside as unknowable, while the physicists get on with the 'theory of everything'.

But since about 1920 physics itself has had to live with a 'double headed' split rather like the famous split in schizophrenia between perception and sensation – the split between classical physics and quantum physics. Dyson's remark about the paranormal could be applied in his own science, where the 'cumbersome tools' of classical physics cannot be applied to quantum physics. The philosopher Colin McGinn notes 'the causal chaos that surrounds quantum theory' and adds that 'the world may not be as well-behaved causally as we tend to think.' Furthermore, 'Science is apt to be speculative; it is not in general some kind of simple registration of the objective facts. And there is a very specific reason for this: the reliance on induction and abduction as ways of going beyond the data… The great

prestige of science should not blind us to the very real epistemological concerns it raises – concerns that were quite apparent to philosophers of science during its infancy.'

I have no doubt that many readers will be able to experience the phenomenon of 'more-than- coincidence' if they turn their attention to the details of everyday life and look out for it. Without a doubt the phenomenon exists. The questions that arise about whether it is meaningful or simply random appear to be unresolvable in terms of the statistics of chance. The range of events under consideration is too huge – cosmological, in fact. The laws of chance so far can only be established for extremely simple events such as the tossing of a coin, and even then prediction of what the next toss will bring is random. Again readers can use their own judgement about whether the 'event clusters' and patterns of more-than-coincidence are meaningful or random.

Pulsation and oscillation

I propose that pulsation is the defining characteristic and measure of life. We are aware of time (or invent it) because of the distinction between our biological pulsation and the various oscillations (vibrations, waves and rotations) that surround us in the non-living world. The distinction between pulsation and oscillation is not made in dictionaries where they are usually defined as identical: 'alternating expansion and contraction'. But think of the oscillation of a plucked guitar string or of the sun (which expands and contracts in a regular 2 ½ hour cycle) and the pulsation of a jellyfish, or of our breathing or our heart. Oscillation and pulsation are observably different.

Oscillation is 'equal phase': the expansion and contraction of the sun, or the twanging up and down of the guitar string, are as regular as the swinging of a pendulum. The length (or time) of the expansion equals the length (or time) of the contraction, although as the sun cools and the tension of the guitar string diminishes, the amplitude of the equal phase expansion / contraction phase diminishes.

Pulsation is 'unequal phase': the expansion of the jellyfish's membrane takes about half as long as the contraction which propels it along, just as

with the heart's expansion and its contraction, and with breathing in and out.

We are surrounded by regular oscillations or pulse-waves (of tides, of electromagnetic waves, of stars seen twinkling through the oscillating atmosphere, of pendulums) and we pulsate for as long as we live. Pulsation and oscillation are 'out of synch'. We perceive the endless vibrations / pulse-waves in which we live as a continuum. But we are ourselves, because of our pulsation, discontinuous. From our position of discontinuity we are aware of our own 'time' as against the surrounding continuum of apparent time events in motion. The paradox is that modern physics shows that the surrounding continuum is timeless. All that motion is relative, not absolute.

Bergson described in the early 20th century how we 'spatialise' time. Barbour is the ultimate spatialiser. He proposes that time is simply length in a universe of pure shape. In either case oscillation and pulsation can be described as shapes. They will still be distinct. The distinction does not immediately raise the question of the existence of time. But it turns out to have explanatory power. It brings a new perspective to such questions as the demarcation of life from death, dualistic versus monistic philosophy, the distinctions between health and illness, emotion and thought, consciousness and the lack of it, voluntary and spontaneous activity, and how we experience time in what may be a timeless universe.

Pulsation is a shade suspect to those who know of the work of Wilhelm Reich, the neurologist and psychoanalyst who saw it as part of 'the function of the orgasm' and (almost certainly wrongly) as an expression of 'life energy'. I spent some years studying Reich's work, while practising his method of intensive psychotherapy which involves direct work with the emotions and bodily movement. The theories Reich built hastily on his observations are often wrong, and he confused pulsation and oscillation, but the observations themselves are often valid. In this book I discuss Reich and other fringe scientists – or perhaps they could be called scientists fallen from grace – in particular Paul Kammerer, and J W Dunne. It is not that I have an affinity for fringe science. Reich and Kammerer followed their ideas to the edge of madness, and undermined them with hasty and grandiose claims. Having worked for many years in so called 'mental health' (actually mental illness) services I find madness both tragic and monotonous. But

keeping in mind the Australian philosopher David Stove's scathing essay 'What is Wrong with our Thought?' in which Plato, Plotinus, Berkeley, Kant, and Foucault get their come-uppance for the *obvious* logical flaws in their theories, I am not sure that Reich and Kammerer are much less mad than various 'great' (or grandiose) thinkers. Both had sound credentials as scientists, were conscientious and even brilliant experimentalists, and made observations worth considering – which perhaps their oddities and immunity from conventionality enabled them to make.

I had a chat with Stephen Hawking about poetry and science when I met him at a college reunion dinner in 1999. (I had known him slightly 37 years before – but in those days at Oxford it was considered bad form to talk about one's own subject, so we probably talked about rowing or beer.) Now we had been talking about a poet we both knew, and I asked him whether he always thought scientifically or did he think poetically too. He wrote on his screen: 'Hard to distinguish. What is the difference between them? Is there a test?' I said I thought there was little difference between good science and good poetry, but a million miles of difference between bad science and bad poetry. His eyes showed amusement. Later in the evening I came back to him with: 'Here's a possible test of good poetry and good science. They both make your hair stand on end.' To which he wrote: 'What about an electric shock?'

This was a fairly typical piece of Hawking mischief. I remembered from years before his tendency to deflect any serious remark with a joke. But he may have been as serious as I was. An inspired poem and an inspired scientific insight both have the power to shock. Both state rational truth but both have begun in sudden revelation or intuition, an interruption in ordinary thought. And I think science can only advance, and poetry can only exercise what Thomas Hardy called its 'sustaining power', if each is open to the thinking of the other. The other side to the death of objective time is the subjective experience of continuing to live it. The interface between the objective and the subjective is surely a right point of concentration for both science and poetry.

I am not arguing that physicists 'should' read poetry or that poets 'should' study physics. But I think there are more points of contact between the two than is usually acknowledged. And one can inform the other. Various ideas

from physics turn up in poems. And some physicists – Mae-Wan Ho and Julian Barbour for example – quote poems which support their view of reality.