

HARMONY, COSMOS, ECOLOGY AND POLITICS

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Life begins with the process of star formation. We are made of stardust. Every atom of every element in your body except for hydrogen has been manufactured inside stars, scattered across the universe in great stellar explosions, and recycled to become part of you.¹

HARMONY

The concept of Harmony suggests that, for the universe to function, there must be an essential balance in its energy and structure. The notion that balance is fundamental to the cosmos is found throughout traditional and indigenous cultures and continues in the our modern world. What I want to do here is pull together various statements and claims about cosmology, both traditional and modern, and discuss what they may mean for ecology and politics.

Modern science has identified balance in the universe in novel ways. For example, the law of conservation of energy states that energy can neither be created nor destroyed, only converted to another form: when energy appears in one form an equal amount of energy must disappear in another. As Richard Feynman put it, ‘there is a certain quantity, which we call energy, that does not change in the manifold changes which nature undergoes’.² We also talk about the ‘Goldilocks Zone’, named after the story of *Goldilocks and the Three Bears* and the search for the perfect bowl of porridge. Like Goldilocks’s bowl of porridge, the Goldilocks zone which the Earth occupies is close enough to the Sun to be warm enough, but not too far away to be too cold, and is therefore perfect for organic life. If these conditions are altered slightly then most biological life will come to an end. This, of course, is the threat posed by climate change: that humans will alter the perfect natural conditions that maintain equilibrium on our planet. Even though we are now discovering that life can survive in more extreme circumstances than thought only a few decades ago, the basic principle that we humans depend on special circumstances still remains.³

The physicist John Barrow played a leading part in highlighting the idea that the close relationship between cosmos and consciousness is an integral part

of this order, as claimed by extreme versions of the Anthropic Principle.⁴ When Barrow was awarded the prestigious Templeton prize in 2006, news reports drew public attention to his ideas:

Life as we know it would be impossible, he and others have pointed out, if certain constants of nature – numbers denoting the relative strengths of fundamental forces and masses of elementary particles – had values much different from the ones they have, leading to the appearance that the universe was ‘well tuned for life,’ as Dr Barrow put it.

In a news release, the prize organizers said of Dr Barrow’s work: ‘It has also given theologians and philosophers inescapable questions to consider when examining the very essence of belief, the nature of the universe, and humanity’s place in it.’⁵

We may distinguish two notions of harmony. There is one with a capital ‘H’, which assumes the existence of an ordered structure which is inherent in the fabric of the universe. And there is another with a small ‘h’ which deals with our ability to peacefully get along with each other and the world. I shall use both Harmony and harmony in this chapter, even though it is not always easy to distinguish one from the other. In all the ancient philosophies which deal with it, capital ‘H’ Harmony is embedded in cosmic cycles which transcend humanity and so is not concerned with humanity’s welfare. The entire universe, this model tells us, is subject to the infinitely recurring cyclical creation and destruction of the universe, an idea central to some classical Greek and Indian cosmologies.⁶ Small ‘h’ harmony, on the other hand, is understood as the maintenance of balanced, equitable and peaceful relationships between individuals, societies and the rest of life on Earth. These ideas usually place human welfare as the central concern, focussing on the maintenance of harmonious relationships between people, society and nature, and do not require any philosophical or physical explanation of the universe (although advocates of harmony may well subscribe to such a notion).

A classic use of small ‘h’ harmony was that of E. F. Schumacher in 1963, in his classic and highly influential work, *Small is Beautiful*. He wrote that:

In the excitement over the unfolding of his scientific and technical powers, modern man has built a system of production that ravishes nature and a type of society that mutilates man. If only there were more and more wealth, everything else, it is thought, would fall into place. Money is considered to be all-powerful; if it could not actually buy non-material values, such as justice,

harmony, beauty or even health, it could circumvent the need for them or compensate for their loss.⁷

Harmony, for Schumacher, is clearly used in the sense of peace and balance, alongside justice, beauty and health, as values directly opposed to the unrestrained accumulation of money.

Debates concerning the extent to which the universe operates according to a fundamental order have been of deep significance from ancient times up to the present. The classical view of the relationship between order and disorder was set out by Empedocles in the fifth century BCE. He established the classical foundation for theories of cyclical history and argued that all historical, natural and individual processes in the cosmos oscillate between two opposites: strife and love.⁸ Whenever one of these reaches universal dominance then the cosmos unravels, only to be born again, in an inevitable and infinite cycle of creation and decay. There is a clear apocalyptic narrative here which was to later feed into accounts of the life and death of the universe.

The idea of a universe based on inherent harmonious mathematical ratios was developed by the Greek philosophers, Pythagoras and Plato.⁹ The theory of the harmony of the spheres, for which Pythagoras is widely held to be responsible, was based in the idea that, as each planet travels through space in its own geometrical relationship to the Earth, it makes a sound. Together, these sounds produce a beautiful celestial harmony which, even if we can't hear it, forms part of the cosmic environment which surrounds us.¹⁰ Influenced by this notion, Plato himself expressed the proportions of the cosmos in terms of the musical scale in *Timaeus*, his great work on the origin of the universe.¹¹ Each of the seven planets orbited the Earth on its own sphere, he argued, with the stars on another, making a total of eight spheres. As the planets move through their interlocking cycles, he claimed, they weave the patterns of life which constitute our destiny, accompanied by beautiful, if inaudible, sounds:

And the spindle turned on the knees of Necessity, and up above on each of the rims of the circle a Siren stood, borne around in its revolution and ordering one sound, one note, and from all the eight there was the concord of a single harmony.¹²

The question posed by this model is how we respond to this celestially driven fate. One of Plato's central concerns was to reconcile the cyclical life of the cosmos in terms of capital 'H' Harmony with the welfare of humanity in terms of small 'h'

harmony. He accepted that catastrophes could occur and that the cosmos might also collapse to be born again, but believed that this took place as part of a series of cycles, patterns and rhythms.¹³ Capital 'H' Harmony might well hit a crisis in a cosmic cycle which we experience as deeply unharmonious, and we then have to respond by maintaining small 'h' harmony, as best as we can. Spurred on by the crises of his own time, Plato took on this challenge. His political theories were intended to minimise the disastrous effects of periods of collapse, and he devised an entire system of education and politics designed to preserve stability in the immediate future, and to minimise disruption when a crisis in the cosmic cycle hit.¹⁴

Nowadays, the word harmony is generally substituted amongst astronomers and astrophysicists by more familiar terms such as beauty and symmetry, words which are themselves connected with the search for the universal force which, it is hoped, will underpin the four recognised fundamental forces (gravity, electromagnetism and the weak and strong nuclear forces). Yet, even here, as physics looks for the single force which holds the universe together, order in the form of the increased complexity that comes with evolution, competes with disorder in the form of the disintegration that results from entropy.¹⁵

THE COSMOS

Cosmos, from the Greek *kosmos*, may be understood as fundamental and universal order (universe being the Latin equivalent of cosmos), although it is often translated as 'beautiful order' (and the root of our word cosmetic).¹⁶ A typical modern definition describes cosmology as 'the science, theory or study of the universe as an orderly system, and of the laws that govern it; in particular, a branch of astronomy that deals with the structure and evolution of the universe'.¹⁷ It is this understanding of cosmos as order that allows astronomers to construct models for measuring distances over huge areas, such as the so-called 'Cosmological Distance Ladder', which envisages the distances between near and far objects in the cosmos as being proportional in a significant manner.¹⁸

Two schools of Greek cosmology have exerted an enduring appeal in addition to the Platonic: the Aristotelian and the Stoic, the latter founded by Zeno of Citium. There are significant differences between the three schools, but they all shared a belief that the cosmos is one unified organism in which all things – material, emotional, psychological, and spiritual – are necessarily interconnected and interdependent. People, planets, stones and stars all exist in one immense, marvellous, symbiotic entity. In Aristotle's opinion,

The whole terrestrial region then is compounded of these four bodies and it is the conditions which affect them which, we have said, are the subject of our inquiry. This region must be continuous with the motions of the heavens, which therefore regulate its whole capacity for movement. For the celestial element as source of all motion, must be regarded as first cause.¹⁹

The Stoic worldview was described by the great biographer Diogenes Laertius, who we believe lived in the third century CE, and on whom we rely for much of our knowledge about the Greek philosophers. The Stoics, Diogenes tells us, insisted that nothing is outside nature. He adds that they argued that the cosmos ‘... has no empty space within it but is one united whole’, and ‘... is a living being, rational, animate and intelligent’.²⁰ That is pretty stunning for the average modern world view (if such a thing exists), for it completely challenges the comfortable assumption that some things are alive and animate, and others are inanimate and dead. For the Stoics a stone may have different qualities to a swan, but it is still alive. They believed that human nature is identical to the nature of the universe and that the purpose of life is therefore to live in agreement with nature. Not only that, but nature is essentially good, and guides those of us who live in agreement with it to a virtuous life: a virtuous life is a natural life and vice versa. This what Diogenes wrote around seventeen hundred years ago:

our individual natures are parts of the nature of the whole universe. And this is why the end may be defined as life in accordance with nature, or, in other words, in accordance with our own human nature as well as that of the universe, a life in which we refrain from every action forbidden by the law common to all things, that is to say, the right reason which pervades all things, and is identical with this Zeus, lord and ruler of all that is. And this very thing constitutes the virtue of the happy man and the smooth current of life, when all actions promote the harmony of the spirit dwelling in the individual man with the will of him who orders the universe.²¹

We then get a proposition which runs something like this: if nature is ordered, benevolent, rational and virtuous, it therefore makes common sense to live in accord with it. And if we are wondering what virtue is, it is ‘the state of mind which tends to make the whole of life harmonious’.²² So there is a feedback loop in which, if we as individuals are virtuous, the entire cosmos benefits. Another Stoic, the philosopher Cleomedes, who lived sometime between the first and fifth centuries CE, gave us the standard definition of the Cosmos. He wrote that,

“Cosmos” is used in many senses, but our present discussion concerns it with reference to its final arrangement, which is defined as follows: a cosmos is a construct formed from the heavens, the Earth, and the natural substances within them. This [cosmos] encompasses all bodies, since, as is demonstrated elsewhere, there is, without qualification, no body existing outside the cosmos... And that the cosmos has Nature as that which administers it is evident from the following: the ordering of the parts within it; the orderly succession of what comes into existence, the sympathy of the parts in it for one another; the fact that all individual entities are created in relation to something else; and, finally, the fact that everything in the cosmos renders very beneficial services.²³

We can take two key concepts from Cleomedes’ account. First, the cosmos is benign. As developed by the Neoplatonists in the third and fourth centuries CE, evil, far from being an essential quality of the cosmos, is a consequence of human error and ignorance.²⁴ Evil can thus be banished through education and a correct and virtuous life, a view which was to be central to the development of educational and correctional theory in the nineteenth and twentieth centuries. Second, the cosmos is everything: it is me, it is you, it is the chair I am sitting on, the food I eat, the place in which the food grew, the energy which sustained it, and the star from which that energy came.

Thus, the defining features of the classical Harmonious universe are relationality, connectedness and interdependence. If everything is interdependent we can never absolutely stand outside the cosmos or dissect it in a laboratory. We do not stand outside nature and we do not act on it as independent, separate beings, either as its guardian or its destroyer. The ramifications of this worldview take us into some controversial territory. For example, the concept of the Anthropocene, the geological age which we are now supposedly entering, is dependent on the notion that humanity is now exerting a profoundly negative influence on the planet. But, if we are inside nature, how can we be seen to be outside it and acting on it?²⁵ This is a problem raised by James Lovelock, when he asked ‘Is technological man still a part of Gaia or are we in some or in many ways alienated from her?’²⁶ In other words, how do we tell whether the things that we do are natural or unnatural? Perhaps the lesson is that we should not labour theory too much, but take a pragmatic approach, looking at practical solutions.

The classical Harmonious cosmos proved remarkably persistent, and was to be a staple of Renaissance thought. It received perhaps its most comprehensive treatment from the great seventeenth-century astronomer Johannes Kepler,

who followed Pythagoras and Plato when he argued in his great work, the *Harmonices Mundi - The Harmony of the World* - that the universe could be understood literally in terms of musical scales.²⁷ His ultimate concern was to understand how we act as autonomous individuals in a universe which operates according to divinely inspired mathematical laws. Like Plato, he believed that, as long as human beings successfully live in tune with the celestial harmonies, then peace and order may be maintained. Harmony was carried into Kepler's era by various texts, one of the most popular being the late Roman classic, Boethius's *The Consolation of Philosophy*. As Lady Philosophy speaks, or perhaps sings, she addresses the creator in the following words:

The elements by harmony Thou dost constrain,
 That hot to cold and wet to dry are equal made,
 That fire grow not too light, or earth too fraught with weight.
 The bridge of threefold nature madest Thou soul, which spreads
 Through nature's limbs harmonious and all things moves.²⁸

William Shakespeare had Ulysses say, in *Troilus and Cressida* (published in 1609, ten years before the *Harmonices Mundi*), 'Take but degree, away, untune that string, and hark, what discord follows'.²⁹ And in the *Merchant of Venice*, Lorenzo calls for music to be played, initiating both sweet harmonies and musings on their effects, evoking the harmony inherent in the soul, if not the body:

How sweet the moonlight sleeps upon this bank!
 Here will we sit and let the sounds of music
 Creep in our ears. Soft stillness and the night
 Become the touches of sweet harmony.
 Sit, Jessica. Look how the floor of heaven
 Is thick inlaid with patens of bright gold.
 There's not the smallest orb which thou behold'st
 But in his motion like an angel sings,
 Still choring to the young-eyed cherubins.
 Such harmony is in immortal souls,
 But whilst this muddy vesture of decay
 Doth grossly close it in, we cannot hear it.³⁰

Lorenzo continues with thoughts on how the man who has no music in himself is not to be trusted:

Therefore the poet
 Did feign that Orpheus drew trees, stones, and floods
 Since naught so stockish, hard, and full of rage,
 But music for the time doth change his nature.
 The man that hath no music in himself,
 Nor is not moved with concord of sweet sounds,
 Is fit for treasons, stratagems, and spoils.
 The motions of his spirit are dull as night,
 And his affections dark as Erebus.
 Let no such man be trusted. Mark the music.³¹

For the classical Platonist, Aristotelian, or Stoic and their Renaissance followers, the material and psychological connections between all things are *real* because there is no more difference between one individual and the surrounding world than there is between parts of the individual body. Therefore, if one part changes, all parts change, and the individual in nature has a real effect on the natural world, just as the natural world has a real effect on the individual. The relationship is real, mutual and continuous.

This much was evident to Isaac Newton, who was deeply immersed in the esoteric currents of the eighteenth century. He was well aware of the Hermetic texts, which had been composed around the second century and had a huge impact on the Renaissance world after they were translated into Latin in the mid-fifteenth century. Newton himself made his own translation of one of the most famous Hermetic texts, the *Tabula Smaragdina*, or Emerald Tablet. We now know that this was written in Arabic around the eighth century, but in Newton's time it was thought to be one of the foundations of ancient wisdom. Newton's translation expresses with great clarity his belief in the unity of heaven and earth, with the sun and moon, metaphorically speaking, in parental roles.

That wch is below is like that wch is above & that wch
 is above is like yt wch is below to do ye miracles of one
 only thing
 And as all things have been & arose from one by ye
 mediation of one: so all things have their birth from this
 one thing by adaptation.
 The Sun is its father, the moon its mother.³²

The Emerald Tablet's point is that there is a reciprocal relationship between change 'down here' and change 'up there'. If human beings make adjustments in their material or spiritual lives, even on a tiny level, then the material and spiritual life of the entire cosmos is affected. Newton's extraordinary quest to understand and explain the laws of nature was driven by his belief that the movement of the stars and planets were an image of God's creation.³³ Eighteenth century thinkers were quick to draw conclusions. Prominent amongst these was Colin McLaurin, Professor of Mathematics at the University of Edinburgh:

Our views of Nature, however imperfect, serve to represent to us, in the most sensible manner, that mighty power which prevails throughout, acting with the force and efficacy that appears to suffer no diminution from the greatest distances of space or intervals of time; and that wisdom which we see equally displayed in the exquisite structure and just motions of the greatest and subtlest parts. These, with perfect goodness, by which they are evidently directed, constitute the supreme object of the speculations of a philosopher; who, while he contemplates and admires so excellent system, cannot but be himself excited and animated to correspond with the general harmony of nature.³⁴

Newton's discovery that a single law – gravity – governed the whole universe was to have a supportive impact on radical politics, including on the American revolutionaries of the 1770s.³⁵ The core principle held that, just as one single law governs the entire universe, so human society must also be governed by the same single law: no king should be above the law any more than any commoner, and the arbitrary exercise of political power was condemned as contrary to natural law. The political implications were articulated in what came to be known as Natural Rights philosophy: life, liberty and the pursuit of happiness, it was claimed, were natural, while tyranny, by complete contrast was unnatural: Nature therefore dictated that unfair laws and oppressive regimes must be opposed. Thomas Paine, one of the leading radicals of the 1770s, who played a prominent role in persuading the American colonists to break with Britain, believed that the perfect order of the planets was a profound demonstration of the truth of God's natural creation, and, quoting the radical French aristocrat, the Marquis de Lafayette, he wrote how the truths which Nature had engraved on the heart of every citizen carried an innate love of liberty.³⁶ That Natural Rights belong to people through the fact of existence and freedom, he claimed, is the default position of the Newtonian universe.³⁷ And the force which manages society for the best, Paine

said in 1776 – paraphrasing Newton in the very year that American independence was declared – is like a ‘gravitating power’.³⁸ It is irresistible: it must succeed. Newtonian harmony emphasised order, stability, regularity and the rule of a law under which all men were, in theory, equal.

The last major explication of Harmony in the west was set out by Gottfried Leibniz, Newton’s contemporary and rival. In Leibniz’s version of ‘Pre-existent Harmony’, things were not maintained in a state of balance by their internal natures but by their relationships.³⁹ Leibniz was criticised for assuming a complete separation between soul and body, unlike mainstream harmony thinking.⁴⁰ Yet, if we extend his views to politics then we may fairly conclude that Harmony depends on mutual respect in relationships. To use another familiar metaphor from traditional cosmologies, in the ordered universe earth and sky mirror each other. We can see the one in the other because they are part of the same system. Native North American cosmology talks of a ‘patterned mirroring between sky and earth’.⁴¹ And as Xiaochun Sun said of Chinese cosmology, ‘The universe was conceived not as an object independent of man, but as a counterpart of and mirror of human society’.⁴² In such a perspective it then becomes the duty of all individuals in a cosmologically-aware society to ensure that their actions are matched with the motions of the heavenly bodies. In traditional Chinese culture this is accomplished by living in balance with the energies that flow all around. Harmony is maintained through a whole series of practices including *feng shui*, the art of harmonising the human environment to *chi* (the energy which pervades space). As Nathan Sivin wrote,

... macrocosm and microcosm became a single manifold, a set of mutually resonant systems of which the emperor was indispensable mediator. This was true even of medicine... Cosmology was not a mere reflection of politics. Cosmos, body, and state were shaped in a single process, as a result of changing circumstances that the new ideas in turn shaped.⁴³

There is, then, a pattern in events, and some periods of time are qualitatively different to others. Again, speaking of China, this is Richard Wilhelm from his commentary on the *I Ching*:

Events follow definite trends, each according to its nature. Things are distinguished from one another in definite classes. In this way good fortune and misfortune come about. In the heavens phenomena take form; on earth shapes take form. In this way change and transformation become manifest.⁴⁴

The notion of relationality in a living cosmos occurs in the great Maya creation epic, the *Popul Vuh*. The Maya cosmos itself came into being as a gradual emergence of order, of something from nothing. The opening lines, in English translation, express the still beauty of a calm morning, the dawn of everything:

Now it ripples, now it still murmurs, ripples, still it sighs, still hums and it is empty under the sky.

Here follows the first words, the first eloquence:

There is not one person, one animal, bird, fish, crab, tree, rock, hollow, canyon, meadow, forest. Only the sky alone is there; the face of the earth is not clear. Only the sea alone is pooled under all the sky; there is nothing whatever gathered together. It is at rest; not a single thing stirs. It is held back, kept at rest under the sky.

Whatever there is that might be is simply not there: only the pooled water, only the same sea.⁴⁵

And then, the text continues, deep within the dark, the Plumed Serpent, the Aztec Quetzalcoatl, the Maker and Modeller of all, stirs and speaks with the Heart of Sky, also known as Hurricane, and the creation begins. The cosmos of the great Mesoamerican and Andean civilisations was alive. Its structure was that of a living body. In this sense it is not necessary to ask what something is made of, or how it moves, but what one's relationship with it is. Another creation story, this time from Australia, is described by the travel writer Bruce Chatwin:

... legendary totemic beings... wandered over the continent in the Dreamtime, singing out the name of everything that crossed their path – birds, animals, plants, rocks, waterholes... so singing the world into existence.⁴⁶

When we look at traditional cultures we find a variety of perspectives. In some the universe is infinite, in others it is enclosed within tight limits; for some it is highly ordered, while others allow much more room for spontaneity. However, what seems to be universal is a notion of balance. A concise summary of the practical application of the concept of balance and relationality in traditional cosmologies comes from Clive Ruggles, who argues that among modern indigenous communities there is evidence of a belief in direct interconnectedness:

Modern examples include the Barasana of the Colombian Amazon, who understand that the celestial caterpillar causes the proliferation of earthly

caterpillars; the Mursi of Ethiopia, for who, the flooding of the river they call *waar* can be determined, without going down to the banks, by the behaviour of the star of the same name; and those modern Hawaiians who still carry on the ancient practice of planting taro and other crops according to the day of the month in the traditional calendar (i.e., the phase of the moon).⁴⁷

MODERN PHYSICS

The lineage from classical Stoicism extends down through the centuries to Albert Einstein, the most iconic of all western scientists. Einstein was profoundly influenced by the seventeenth century Stoic philosopher Baruch Spinoza: 'I believe in Spinoza's God', Einstein wrote, 'who reveals Himself in the lawful harmony of the world, not in a God who concerns Himself with the fate and the doings of mankind'.⁴⁸ In simple terms, Einstein's theory of relativity assumes a complete integration between space and time, and if there is an alteration in one, there is an alteration in the other. In addition, as a Stoic, Einstein believed in a universal order which transcended human interests. He made this abundantly clear:

But the scientist is possessed by the sense of universal causation. The future, to him, is every whit as necessary and determined as the past. There is nothing divine about morality; it is a purely human affair. His religious feeling takes the form of a rapturous amazement at the harmony of natural law, which reveals an intelligence of such superiority that, compared with it, all the systematic thinking and acting of human beings is an utterly insignificant reflection. This feeling is the guiding principle of his life and work, in so far as he succeeds in keeping himself from the shackles of selfish desire. It is beyond question closely akin to that which has possessed the religious geniuses of all ages.⁴⁹

Whereas Einstein placed himself in a continuity with the past, quantum mechanics, the other main strand of revolutionary twentieth century physics, envisages not a continuity with the past but a break. Werner Heisenberg, one of the key pioneers of quantum mechanics, himself had views of harmony. He saw himself as representative of a break in cosmology that occurred after Kepler. In Kepler's *Harmony of the World*, Heisenberg mused, the world could not be understood as independent of God and humanity's personal relationship with him. As Heisenberg tells it, first Galileo, who saw the real universe through his telescope, and then Newton, who created a law of gravity which (Heisenberg thought) had no need of God, allowed humanity to stand outside the natural world and, as he wrote,

‘... separate out individual processes of nature from their environment, describe them mathematically, and thus “explain” them’.⁵⁰ Heisenberg is not quite right in this, for both Galileo and Newton preserved a place for God, but his is a common and influential view. Nonetheless, he continued with his potted history of science, reaching the point in the nineteenth century when electrical theory concluded that force fields rather than matter are the fundamental building blocks of the universe. It is hard to think of a more revolutionary shift in modern science.

The implications for our understanding of our uncertain and complex relationship with the world around us were explored by C. P. Snow in his 1934 novel, *The Search*. Such fictionalised accounts are important because they tell us how far the new physics had penetrated the general intellectual consciousness. In a scene set around 1917, the fictitious narrator’s science teacher sets out the personal consequences of the new atomic theory.

That’s all you’d come to in the end. Positive and negative electricity. How do things differ then? Well, the atoms are all positive and negative electricity and they’re all made on the same pattern, but they vary among themselves, do you see? Every atom has a bit of positive electricity in the middle of it – the nucleus, they call it – and every atom has bits of negative electricity going round the nucleus – like planets round the Sun. But the nucleus is bigger in some atoms than others, bigger in lead than it is in carbon, and there are more bits of negative electricity in some atoms than others.⁵¹

The imaginary teacher then comes close to the idea of the reciprocity of the world above with the world below which we found in the Emerald Tablet:

It’s as though you had different solar systems, made from the same sort of materials, some with bigger suns than others, some with a lot more planets. That’s all the difference. That’s where a diamond’s different from a bit of lead. That’s at the bottom of the whole of this world of ours.⁵²

We ourselves are composed of electricity, as is the entire universe, as Snow’s imaginary science teacher reports to his enraptured students, and are intimately connected to the universe – exactly as the Stoics claimed. Heisenberg himself goes on to consider the even more destabilising effects of quantum mechanics.

The old compartmentalisation of the world into an objective process in space and time, on the one hand, and the soul in which this process is mirrored, on

the other – that is, the Cartesian differentiation of a *res cogitans* [the world of the mind] and *res extensa* [the world of matter] – is no longer suitable as the starting point for the understanding of modern science.⁵³

Having challenged the conventional distinction between mind and matter, Heisenberg proposes instead a world in which they are interrelated, and the scientist is an active participant in this relationship, not a disinterested observer:

In the field of view of this science there appears above all the network of relations between man and nature, of the connections through which we as physical beings are dependent parts of nature and at the same time, as human beings, make them the object of our thoughts and actions. Science no longer is in the position of observer of nature, but rather recognises itself as part of the interplay between man and nature.⁵⁴

The split between mind and body which followed Descartes' new thinking in the seventeenth century is, according to quantum mechanics, a misapprehension. The same goes for the supposed distinction between humanity and nature. Heisenberg continues:

The atomic physicist has had to come to terms with the fact that his science is only a link in the endless chain of discussions of man with nature, but that it cannot simply talk of nature "as such." Natural science always presupposes man, and we must become aware of the fact that, as Bohr has expressed it, we are not only spectators but also always participants on the stage of life.⁵⁵

In Heisenberg's quantum world it is impossible to imagine that one can interfere in the natural world without having consequences for the rest of life, which not everyone could accept. It is well known, for example, that Einstein himself initially rejected quantum mechanics, which brings us to perhaps his most famous statement (often misquoted as 'God does not play dice'). In a letter to Max Born in 1926, Einstein rejected the inherent uncertainty of quantum mechanics:

Quantum mechanics is certainly imposing. But an inner voice tells me that it is not yet the real thing. The theory says a lot, but does not really bring us any closer to the secret of the 'old one'. I, at any rate, am convinced that *He* does not play dice'.⁵⁶

Ever since then, physicists have struggled to find a meeting ground between the certainty of relativity and the uncertainty of the quantum world. One option, according to Partha Ghose, ‘provides a clear and beautiful harmony of classical waves and particles’.⁵⁷ Referring to Niels Bohr, another pioneer of quantum mechanics, Partha Ghose added,

We have also seen how the concept of waves and particles with all their subtleties and dichotomies have evolved since the inception of quantum theory, and also the principal attempts to harmonize them. Bohr viewed them as mutually exclusive but complementary aspects of a quantum entity whereas Einstein, [Louis] de Broglie and [David] Bohm preferred a more inclusive harmony.⁵⁸

Theories of the origin of the universe are equally dedicated to a vision of interrelationship. The core conceptual model is Big Bang theory in which everything is necessarily connected to everything else, however remotely, thanks to a shared origin in a compressed ball of energy.⁵⁹ Fred Hoyle, a great populariser of astronomy, who supported the ‘Steady State’ theory, in which the creation of matter is continuous and the universe neither begins nor ends, wrote that:

our everyday experience even down to the smallest details seems to be so closely integrated to the grand-scale features of the Universe that it is well-nigh impossible to contemplate the two being separated.⁶⁰

Relationality has also found a new place in quantum physics. According to John Wheeler:

The system of shared experience that we call the world is viewed as building itself out of elementary quantum phenomena, elementary acts of observer-participancy. In other words, the questions that the participants put – and the answers they get – by their observing devices, plus their communication of their findings, take part in creating the impressions which we call the system: that whole great system which to a superficial look is time and space, particles and fields.⁶¹

We may also turn to the physicist Paul Davies, for inspiration. Seeking support for the philosopher Karl Popper, Davies wrote that,

An increasing number of scientists and writers have come to realise that the ability of the physical world to organise itself constitutes a fundamental, and deeply mysterious, property of the universe. The fact that nature has creative power, and is able to produce a progressively richer variety of complex forms and structures, challenges the very foundation of contemporary science. ‘The greatest riddle of cosmology’, writes Karl Popper... ‘may well be ... that the universe is, in a sense, creative’.⁶²

Classical Harmony required a divine creator, even if an impersonal one, who set the cosmos in motion. That creator may be a mind or a consciousness. We might characterise it as a god, or God. Perhaps we have no need of God, but rather of pattern, or order, or laws of physics. Frances Crick’s ‘Astonishing Hypothesis’ is a recent and influential statement of the materialist, atheist position. As defined by Crick, ‘... your memories and your ambitions, your sense of personal identity and free will, are in fact no more than the behaviour of a vast assembly of nerve cells and associated molecules’.⁶³ Crick’s rhetorical bias, though, is evident in his use of words such as ‘no more than...’ Surely the arrangement of atoms into minds and eventually thoughts is astonishing. When, we may ask, does a group of atoms arrange itself so as to reflect on its existence? We might question whether, if every particle of matter in our bodies has already passed through three stars, including our Sun, since the Big Bang, and if, as Crick argues, consciousness is a property of matter, at what point in this process does matter develop the ability to inquire into itself? In other words, where is the boundary between matter and consciousness?

Both Einstein’s and Heisenberg’s theories have an immediate significance for ecological thought. In Einstein’s universe the complete and harmonious integration of time and place removes any distinction between humanity and nature, and the same outcome flows from Heisenberg’s argument that we are all participants within nature, rather than external observers influencing it. Both Einsteinian and Heisenbergian perspectives lead down the path to ‘deep ecology’, which is discussed below. As an additional consideration, Heisenberg’s universe, being inherently uncertain, is therefore complex. There can be no simple solution to any problem, and therefore no quick fix. The universe is characterised by relationality, which means that if I move here, something else moves there, and I may not know what that something is until I have moved. To move carefully, and with regard to the consequences of one’s actions, is the essence of Harmonious cosmology in action.

However, the Harmonious cosmos does not guarantee human beings a

comfortable life. After all, nature, as Tennyson wrote in 1850 often seems to be, ‘red in tooth and claw’, hardly harmonious in a placid, peaceful sense, as man, the transcendent creature, is ravaged by the reality of death:

She cries, “A thousand types are gone:
 I care for nothing, all shall go.
 ‘Thou makest thine appeal to me:
 I bring to life, I bring to death:
 The spirit does but mean the breath:
 I know no more.” And he, shall he,
 Man, her last work, who seem’d so fair,
 Such splendid purpose in his eyes,
 Who roll’d the psalm to wintry skies,
 Who built him fanes of fruitless prayer,
 Who trusted God was love indeed
 And love Creation’s final law--
 Tho’ Nature, red in tooth and claw
 With ravine, shriek’d against his creed--⁶⁴

The Stoic perspective is at home with the rawness of nature, and acknowledgment of it leads to a calm soul and moderate action. But Tennyson’s nature, ‘red in tooth and claw’, sits uncomfortably with romantic views of nature as essentially benign.

HARMONY AND ECOLOGY

This all takes us to the question of shallow ecology and deep ecology, the two versions of the ecological movement as defined by Arne Naess in his seminal lecture in 1972.⁶⁵ In Naess’s distinction, shallow ecology is functional and pragmatic and focuses on the fight against pollution and resource depletion. It is completely anthropocentric. We might consider it Platonic, in terms of classical psychology, in that it depends on the independence of humanity from nature, and sees nature as a separate entity which humanity can manipulate. By contrast, deep ecology is completely Stoic, in that it assumes that there is no distinction between humanity and nature. The first principle of Deep Ecology, with capital letters, as defined by Arne Naess, is: ‘Rejection of the man-in-environment image in favour of the relational, total-field image. Organisms as knots in the biospherical nest or field of intrinsic relations’.⁶⁶ We can imagine the man-in-environment as the Romantic

artist, a poet, or painter, receiving spiritual sustenance from being immersed in nature, wandering through meadows or wooded valleys, or climbing hills beneath sun, clouds or stars. Naess says, however, that we must go beyond imagining the artist as inspired by nature: he or she is a part of it, and has no existence separate from it.

Naess also had a deep interest in Einstein, which became explicit in 1985 when he met the physicist Øyvind Grøn, with whom he collaborated on an attempt to make the mathematics of relativity accessible to a general audience. Naess and Grøn considered the consequences of relativity for vector fields. Using wind as an example, they wrote:

When we are out doors in the wind, the moving wind fills the region around us. There is a measurable velocity of the air everywhere in the region... The velocity [of the wind] has a magnitude and a direction. It is a vector. Thus a velocity field is linked conceptually with every point of the region. These abstract vectors are everywhere. If one can think of God as omnipresent, then one might also be able to think of the factors as omnipresent. In such a region there is said to be a vector field.⁶⁷

Naess and Grøn then consider the conceptual problem that we normally have when using flat weather maps, which must be inherently misleading because they do not represent multi-dimensionality. Of a two-dimensional map, which they use as an example, they write: ‘... the vectors representing the wind velocity was (sic) implicitly assumed to exist in a flat three-dimensional region. However, the space-time of general relativity is curved’.⁶⁸ The conclusion we may draw is that, as opposed to normal Euclidean space, the space of our daily perception, in which arrows are drawn as straight lines without end, Einsteinian space bends arrows, which eventually, if we follow this logic, return to where they started.

To apply this notion to deep ecology, every natural relationship curves in on itself, creating feedback loops which may exacerbate individual trends, adding a chaotic quality. Chaos theory, as defined by James Gleick, still assumes pattern and order, unlike the random confusion we normally associate with chaos, although of a continuously evolving and open-ended kind, rather than operating according to fixed rules.⁶⁹ In relation to harmony, the chaos of chaos theory is patterned, emergent and complex, rather than ordered and repetitious as in the classical theory of harmony. Naess’s use of wind as an example of complexity, for example, also has a precedent in Heisenberg’s use of wind and ocean currents to describe wider contexts:

With the seemingly unlimited expansion of his material might, man finds himself in the position of a captain whose ship has been so securely built of iron and steel that the needle of his compass no longer points to the north, but only toward the ship's mass of iron. With such a ship no destination can be reached; it will move aimlessly and be subject in addition to winds and ocean currents. But let us remember the state of affairs of modern physics: the danger only exists so long as the captain is unaware that his compass does not respond to the Earth's magnetic forces. The moment the situation is recognised, the danger can be considered as half-removed.⁷⁰

Again, having identified the problem, Heisenberg suggests a solution:

For the captain who does not want to travel in circles but desires to reach a known – or unknown – destination will find ways and means for determining the orientation of his ship. He may start using modern types of compasses that are not affected by the iron or the ship, or he may navigate, as in former times, by the stars. Of course we cannot decrease the visibility or lack of visibility of the stars, and in our time perhaps they are only rarely visible.⁷¹

Naess was clearly a devotee of logic. More to the point, we may see his entire portrayal of deep ecology as a definition of harmony, consisting of seven organisational, political and philosophical components: (1) an understanding that humanity exists completely within nature, not outside it; (2) biospherical egalitarianism or respect for all life; (3) an anti-class posture, which he sees as essential for conflict resolution; (4) the fight against pollution and resource depletion, which is shared with shallow ecology; (5) recognition that the world is complex and that multiple factors must be taken into account to understand the functioning of any single system, if indeed there is such a thing as a single system; and (7) local economy and decentralisation. Perhaps, to continue the shallow/deep ecology dichotomy, we could imagine two versions of harmony, a shallow version which focuses on harmonious relationships (and is no less important for that) and another, capital 'H' Harmony, which is deep in that it envisages the total immersion of humanity in nature.

Having outlined the seven components of deep ecology, Naess then considers three additional principles and consequences. The first is that the principles of deep ecology are not derived from ecology by logic or induction but more from intuition (although that is not a word he uses). This is a position which would be acceptable to the Platonist for whom rationality suggests contact with the divine, and also the Stoics, for whom knowledge comes from immersion in the natural world.

Secondly, Naess deals with the problem of values. Thirdly, and significantly for this chapter, he develops the notion of eco-philosophy, or ecosophy, which he describes as a philosophy of ecological harmony or equilibrium.⁷² By harmony he means what he calls ‘a kind of *sofia*, which includes norms, rules and values which are human in origin, along with hypotheses concerning the state of affairs in a universe’.⁷³ He continues: ‘... wisdom is policy wisdom, prescription, not only scientific description and prediction’.⁷⁴

The question he raises, then, is how we act politically. There is no standard political programme, and neither can there be, for ecosophical priorities vary according to time, place and culture. Referring to Aristotle and Spinoza for support, he states that ‘an ecosophy is expressed verbally as a set of sentences with a variety of functions, descriptive and prescriptive (in which)... The basic relation is that between the subsets of premises and subsets of conclusions’.⁷⁵

Naess later proposed eight policy principles and actions:

1. All life has value and human and non-human life are interdependent.
2. Diversity of life forms is valuable.
3. Humans have no right to reduce diversity except to satisfy *vital* (Naess’s emphasis) needs.
4. The human population of the Earth needs to decrease.
5. Current human interference with the non-human world is excessive.
6. Social, technological and economic policies must change, and the result will be a ‘more joyful experience of the connectedness of all things’.
7. The key ideological change should be towards an emphasis on the quality of life.
8. Individuals who recognise points 1-7 have an obligation to actively work for them.⁷⁶

At face value, few people would disagree with points 1 and 2, which have become conservative orthodoxy in some quarters. Even that symbol of the British media establishment, *The Sunday Times*, recently carried a supplement headed ‘Don’t try to “solve” diversity, celebrate it’.⁷⁷ Most would agree with 5 and, increasingly, with 7 – witness the increasingly popularity of wellbeing and happiness indices. However, number 4 is undoubtedly problematic. Who is to say which people should cease having children, and how would this be policed (given the problems associated with China’s one-child policy)? And is number 6 reminiscent of the long – and failed – tradition of religious utopianism in the Christian world, and number 8 suggestive of the authoritarian *communitas* of modern revolutionary politics? These are all profoundly difficult questions.

HARMONY AND POLITICS

The question is where all this leaves us in terms of contemporary politics. The risk of deep ecology is that it leads directly to an authoritarian perspective; witness the awful example of green Nazism, in which ecology was an adjunct to racial cleansing.⁷⁸ The issue is critical at the present time, largely due to the Chinese government's use of Harmony as a guiding political concept. For example, at the opening ceremony of the Belt and Road Forum for International Cooperation, the Chinese President Xi Jinping gave a speech, recalling that,

The ancient silk routes brought prosperity to these regions and boosted their development. History is our best teacher. The glory of the ancient silk routes shows that geographical distance is not insurmountable. If we take the first courageous step towards each other, we can embark on a path leading to friendship, shared development, peace, harmony and a better future.⁷⁹

The former president, Hu Jintao, declared that a socialist harmonious society 'will feature democracy, the rule of law, equity, justice, sincerity, amity and vitality', resulting in 'an honest and caring society, and a stable, vigorous and orderly society in which humans live in harmony with nature'.⁸⁰ This is all very well, but doesn't really match the government's oppression of the Tibetans and Uighurs, which frankly resembles traditional imperialism rather than any lofty ideal. In addition to which we have the example of China's attempts to create an economic empire.⁸¹ The issue can be reduced to a debate concerning the application of Confucian cosmology to the management of the state. Does the Confucian concept of harmony require the sacrifice of individual rights to an overarching order? Or does order depend on the recognition of individual rights? And does it promote economic justice? Even if the Chinese government employs harmony as a rhetorical device to justify its totalitarian instincts, the consensus amongst scholars is that Confucian political theory respects individual rights and sees harmony as emerging from the balance of relationships between people.⁸² In response to claims that harmony and human rights are incompatible, Stephen Angle argues that a commitment to both is, as he says, both 'coherent and desirable'.⁸³ Angle's conclusion is based on an understanding of the word *he* (和) – which in Mandarin Chinese can mean harmony, together with, peace, or union – as recognizing not uniformity, but the complex relationships between all things. In his view, 'The value of harmony comes precisely from its ability to preserve and respect differences, because we are all better off when these

differences are meshed, to whatever appropriate degree, rather than flattened'.⁸⁴ This is the polar opposite of the Chinese government's position, and a suitable model for a democratic understanding of harmony.

The political-harmony problem was resolved in European thought by Johannes Kepler, who engaged in a major debate with that other major advocate of harmony, Robert Fludd. Kepler's problem with Fludd was that his cosmology was drawn from the kind of abstract mathematical and metaphysical structures constructed over the previous two thousand years and dating back to Pythagoras. Kepler's own theory was based on nature, as demonstrated by his astronomical observations. Kepler wrote of Fludd that: 'He seeks harmonic proportions in degrees of darkness and light, without respect to any motion: I seek harmonies only in motions'.⁸⁵ Fludd's harmony can be portrayed, perhaps unfairly, as static and other-worldly (this was certainly Kepler's view of Fludd's position). Kepler saw the cosmos as a single community consisting of the relationship between what he referred to as the 'family relationships of the wandering stars [i.e., planets]' and the 'family relationship of sounds'; his harmonious universe was both dynamic and existed in a continuous state of development.⁸⁶ Every moment brought its potential risks and opportunities which might be reflected in one's engagement with God, but also with politics.⁸⁷ The ebb and flow of harmony as represented by astronomical cycles had an immediate this-world impact, which would be encountered in political crises when planetary patterns indicated stress. Kepler's harmonic political theory envisaged that the threat of popular disturbance at such moments should be met partly by repression – as normal in his world as it is modern times – but also, radically for his time, reform.⁸⁸ In this sense, Kepler's state therefore resembles a modern social-democracy, in which individual rights are respected but, at the same time, regulated by law. If there is a way, then, to practice harmony within a Harmonious cosmos, it is to make mutual respect the default position. No doubt there are situations in which one individual or group may feel that they are not being given the respect that they deserve, in which case the law will step in – not the law of physics (or nature), but the law of society (as correctly arising from nature).

This brings us to the final issue, the need for an ethical framework, 'an ethics of harmony, a true earth ethic', as Haydn Washington calls it.⁸⁹ A fundamental distinction in current 'Green' ethical thought distinguishes 'environmentalism', which depends on a managerial approach to environmental problems, from 'ecologism', which argues for 'radical changes in our relationship with the non-human natural world, and in our mode of social and political life'.⁹⁰ According to this view, environmentalism is shallow ecology by another name, an inferior activity concerned with saving the planet on behalf of humanity, while ecocentrism

and deep ecology subsume humanity within the ecological system. As Stan Rowe put it:

Because “environment” means that which encircles something more important, literal “environmentalists” are willy-nilly anthropocentric, placing less value on the surrounding world than on humanity and self. If that causes uneasiness, the central position of the self can be retained painlessly by redefining it as a broad field-of-care embracing Earth. But this is an ineffectual gesture if, when push comes to shove, humanity is always accorded top billing. The question of priorities is critical.⁹¹

Rowe goes on to discuss the consequences of this argument:

Should our loyalty embrace the entire “field-of-care” or does sympathy fasten first and always on the starving family metaphorically ploughing the “field” into oblivion? The whole field should command our allegiance, say I. It is time to eschew human self-interest and recognize the inherent worth and surpassing values of Earth’s miraculous ecosystems whose workings we do not understand. *Anthropocentrism says we know how to control and manage them; ecocentrism says “not yet; maybe never.”* (original emphasis).⁹²

Ecocentrism is, then, in classical terms, a restatement of Stoicism, in which humanity is completely embedded in nature, itself conceived as a single entity, to the extent that the possibility of effective human action is limited. Stoic ethics has a number of characteristics. First, it is teleological: it assumes a goal which already has a kind of existence in the future and which lends existence in the present a purpose; second, it equates ethics with wisdom.⁹³ A significant recent contribution to the debate has been made by Patrick Curry, who has extended classical ‘virtue ethics’, into what he calls a Green Virtue Ethics (GVE), which escapes the anthropocentrism which prioritises human interests alone, and instead recognises humanity as embedded in nature. He suggests that we should acknowledge that ‘nature takes its proper place at the heart of *all* beings, not merely an add-on extra to make us feel better humans’.⁹⁴ An ecological virtue ethic, he concludes, should take into account the good of the entire Earth community. As Stan Rowe said, ‘We are Earthlings first, humans second’.⁹⁵ Wherever such ideas lead, the necessary precondition is, as the United Nations states, in a context of social justice.⁹⁶ Or, as the eighteenth-century radicals proposed, the law of the universe impacts on everyone equally and, in the harmonious universe, everyone’s rights must therefore be equally protected.

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