

AS ABOVE, SO BELOW

*'That which is below is like that which is above.
That which is above is like that which is below.'
Hermes Trismegistus*

Macrocosm – Microcosm

One of the fundamental tenets of esoteric cosmology is the symbiotic relationship between the *macrocosm* (the greater universe) and the *microcosm* (the human psycho-physical organism). In this sense each human being is potentially a miniature universe which contains "all knowledge, measure and number." Professor Jacob Needleman: "In this form, the idea tells us that the same laws and substances that govern and constitute the stars also govern and constitute the human organism."

In his visionary book *The Meeting of Science and Spirit*, educator and author John White articulates the profound spiritual implications of awakening to the place of humanity in the cosmic order:

It is said in metaphysics that the human being is the center of the universe. This is not meant egocentrically or astro-physically but rather that each of us is a point of confluence for higher and lower worlds, the visible and the invisible, the mundane and the sublime. Through a mysterious process the universe infolds upon itself to produce the human species that, although finite, is aware of infinity . . . is imperfect but inspires to perfection. The macrocosm produces the microcosm; as above, so below. Each of us is thus a meeting point of the mental and material, consciousness and cosmos, inner and outer space. Every plane of reality, every level of being is contained within us. At the same time, paradoxically, we are contained within them . . . Humanity is involved in a mighty evolutionary drama of awakening to God, to the Creator, to the Great Mystery. A two-way process is at work/play behind that self-discovery in which the lower world reaches upward while the higher world reaches downward to encourage the lower to keep reaching. (1)

Throughout history, human beings have drawn correspondences between the macrocosm and the microcosm, following the Hermetic axiom 'as above, so below.' The patterns of human form and structure and of the architecture of the psyche are said to be analogies of cosmic patterns and events: "The objects of the senses are not only symbols of the divine archetypes but are also the manifest bodies of those inner realities. Every element has its source from a higher form, and all things have their common origin from the Word (*logos*), the Holy Spirit. God is at once both the matter and the form of the universe. His substance is the foundation of all, and all things bear His imprint and are symbols of His Intelligence."

There is no part of man, as there is no part of the cosmos, which has not emerged from the unitary source. Within us and around us we experience nothing but aspects of divine consciousness; but, if we wish to arrive at a knowledge of the source of all things, we have to search in the one place where we can have knowledge at first hand, and that is within ourselves. Around us is the macrocosm, within us is the microcosm; each in its own way gives us knowledge of the other in that divine interplay of subject and object which is the source of all knowing and all being. (2)

The concept of 'the microcosm reflecting the macrocosm' appears throughout history in many religious, spiritual and metaphysical traditions:

- Indigenous traditions of Africa and the Americas
- The monotheistic religions of Judaism, Christianity and Islam ('Man is made in the image of God')
- Greek philosophers Pythagoras, Heraclitus, Plato and Anaximenes of Miletus
- Chinese Taoism ('The Tao gives birth to infinite worlds')
- Hindu Tantra ('What is here is everywhere')
- Buddhism ('The One in the many')
- Gnosticism ('The Cosmic Man')
- Sufism (Jafar Sidiq: 'Man is the microcosm, creation is the macrocosm, the unity. All comes from One.')
- Kabbalah ('Adam Kadmon')
- Medieval alchemists of the West and East

A similar concept has also been expressed in the works of a number of modern Western writers and philosophers, notably William Blake ("To see a world in a grain of sand"):

Each of us is identical with the entire universe – not in terms of what can be weighed and measured, but because we have the potential to experientially identify with any of its parts. Thus, in the monadology of the great German mathematician and philosopher Gottfried Wilhelm Leibniz, the universe consists of monads, essential forms of being that are eternal and indestructible. Each of them contains the information about all the others and reflects the entire universe in a pre-established harmony. According to Alfred North Whitehead the universe is made up of momentary events of experience rather than enduring material substance. Each of these moments ("actual events" or "actual occasions") contains the entire history of the universe and is internally related to all the others. (3)

The 'macrocosm-microcosm' concept has also been expressed symbolically in certain metaphysical teachings; the human being is described as "a droplet in the cosmic ocean" or as "a

spark of the divine fire." And the same principle has been pictorially represented as two interpenetrating triangles in the images of Tantric yantras (mystical diagrams) and the Star of David.

In traditional cosmological teachings a correspondence is posited between the forces manifested in the cosmos and the subtle organs of the human body. Mircea Eliade: "In the Tantric conception, the cosmos appears as a vast fabric of magical forces; and the same forces can be awakened or organized in the human body, through the techniques of mystical physiology."

The belief that a human being is a 'microcosm of the macrocosm' has also taken practical form in the teachings and practices of many traditional spiritual systems. For example, in Tai Chi and qi gong specific movements and breathing exercises are employed to enhance the flow of *chi* (vital life force) throughout the body. These practices were also evident in the Vedic culture of ancient India and form the basis of the path of Yoga, which strives to attain an essential harmony between the human body-mind and the energy of the greater cosmos.

There are also indications that modern science recognizes a potential common ground with traditional metaphysical teachings in the concept of 'inner and outer realms of existence.' In *Astrophysics and Creation: Perceiving the Universe Through Science and Participation*, Dr. Arnold Benz, while acknowledging that the fields of science and metaphysics are based on fundamentally different approaches and principles, also asserts that they can mutually support each other by providing a bridge between the "outer" and "inner" worlds of human experience, reflecting the ancient dictum 'as above, so below':

"As above, so below; as below, so above" was the motto of an old Egyptian mythology. It claimed a correspondence between the divine and the earthly. The spatial concepts identified with "above" and "below" have changed, however, in our modern worldview. Today astronomers find that molecules in space radiate in the same way that they do in terrestrial laboratories. The physical laws in the universe and on Earth are not just analogous, but identical. Yet today we still perceive reality on different planes. They no longer have the former attributes of "above" and "below," but of "interior" and "exterior." Science explores the exterior reality by objective measurements and observations. Reality confronts us, however, also through participatory perceptions. Thus, fundamentally different perceptions are the basis of science, on the one hand, and religion and art, on the other. These distinct perceptions likewise span different planes of language and methodology. Even if science and those existential experiences upon which religion and art are based have different sources of perception, they can still relate to each other. An analogy in the form of "as interior, so exterior" may be invoked to describe certain parallel experiences in science and in human life. (4)

Other leading-edge scientists have also affirmed a central connection between human beings (microcosm) and the greater cosmos (macrocosm) based on the findings of quantum physics. Nobel laureate Frank Wilczek: "The most daring hopes of Pythagoras and Plato to find

conceptual purity, order, and harmony at the heart of creation have been far exceeded by reality. There really is a Music of the Spheres embodied in atoms and the modern Void." In *A Beautiful Question: Finding Nature's Deep Design*, he writes:

The leading interpretation of this picture draws marvelous connections between microcosmos and macrocosmos. The microwave sky is a snapshot of conditions early in the history of the Universe, roughly thirteen billion years ago, and about one hundred thousand years after the Big Bang. Light radiated then is arriving here now, having traveled a very long way. This is the message it brings. Thirteen billion years ago the Universe was almost, but not quite, perfectly uniform. It contained parts-in-ten-thousand deviations from perfect uniformity. Those deviations from uniformity grew by gravitational instability (denser regions attract matter away from surrounding less dense regions, and the contrast grows). Eventually they gave birth to galaxies, stars, and planets as we know them today. This is all fairly straightforward astrophysics, once one has the seeds. So the big question becomes: How did those seeds arise in the first place? We need more evidence to be certain, but it seems likely, based on the evidence so far, that they started as quantum fluctuations. In present day conditions quantum fluctuations are significant only at very small distances, but an episode of very, very rapid expansion during the early history of the Universe, through the process known as cosmic inflation, can stretch them to universal proportions. We humans are poised between Microcosm and Macrocosm, containing one, sensing the other, comprehending both. (5)

The discoveries of modern science have also revealed the tremendous *scale* of the many levels of the universe and the place of humanity in this vast, complex cosmic schema. On a cosmic scale, human beings are minuscule. Yet the brain is a microcosm of the macrocosm: it is capable of forming more possible thoughts than there are atoms in the universe. "Underlying the complexity of the physical world at all scales of existence, from the most minute subatomic particles to the vast regions of space, is a fundamental harmony and coherent order. Human beings literally stand midway in scale between these two realms."

Humans can seem minuscule at astronomical levels; they can seem ephemeral on evolutionary scales. But another perspective is possible: on the natural scale the human world stands about midway between the infinitesimal and the immense. The mass of a human being is the geometric mean of the mass of the earth and the mass of a proton. A person contains about 10^{27} atoms, more atoms than there are stars in the universe. In astronomical nature and micro-nature, at both ends of the spectrum of size, nature lacks the complexity that it demonstrates at the mesolevels, found in our native ranges on Earth. We humans do not live at the range of the infinitely small, nor at that of the infinitely large, but we may well live at the range of the infinitely complex. (6)

In his Fourth Way teachings, Gurdjieff stressed the importance of unity and oneness as an all-embracing principle: "Everything in the universe is one, the difference is only of scale; in the infinitely small we shall find the same laws as in the infinitely great. As above, so below." The same fundamental laws occur in both the universe and within each human being: "We have in us the sun, the moon, and the planets, only on a very small scale." These laws can be studied simultaneously in both worlds. However, Gurdjieff taught that, in general, it is easier to begin with self-study:

The ancient formula '*As above, so below*' from the 'Emerald Tablet of Hermes Trismegistus' stated that all the laws of the cosmos could be found in the atom or in any other phenomenon which exists as something completed according to certain laws. This same meaning was contained in the analogy drawn between the *microcosm* – man, and the *macrocosm* – the universe. The fundamental laws of triads and octaves penetrate everything and should be studied simultaneously both in the world and in man. But in relation to himself man is a nearer and more accessible object of study and knowledge than the world of phenomena outside him. Therefore, in striving towards a knowledge of the universe, man should begin with a study of himself and with the realization of the fundamental laws within him . . . The study of the world and the study of man will assist one another. In studying the world and its laws a man studies himself, and in studying himself he studies the world. (7)

A number of other modern concepts resonate with the principle of scale in the macrocosm-microcosm continuum. Scientists describe a holographic "self-similar" mirroring of the physical world at all scales of existence. Dr. Jude Currivan: "The cosmic hologram reveals the unity of consciousness and its macrocosmic expression as our Universe, all-pervasive and essentially unified while being played out on all levels and scales of existence and myriad levels of awareness. We, individually as unique microcosms and collectively as meso-cosmic intelligence, contribute to the co-creative experience of our Universe." The universe also appears to be organized as a system of 'nested hierarchies' within an overall unity. In *Man in the Cosmos*, Dr. Christian Wertenbaker writes:

Each relatively independent entity can be regarded as a cosmos. We are familiar with the idea of the macrocosmos (the universe), and the microcosmos (man). In the traditional view, human beings are considered to be miniature replicas of the whole, each an organism in its own right: the universe, the galaxy, the solar system, the planet, the animal, the cell. In this view, the universe consists of a nested series of interacting, interdependent organisms, and this is its basic organizational pattern. Each cosmos maintains its identity, its life, for a time, by virtue of its self-generated selective relationship in the outside world, and also serves the purposes of the larger entities it is a part of. While we take for granted that such hierarchical arrangements of nested entities are the norm in the human realm – countries, states, municipalities, organizations, homes – we do not generally perceive the whole universe to be organized in this way. G.I. Gurdjieff

said: "Knowledge begins with the teaching of the cosmoses," emphasizing the importance of this organizational principle. (8)

Universal Patterns and Laws in Nature

Many ancient teachings hold that God or Spirit created the universe as a 'divine pattern or idea' which functioned as a template, resulting in increasingly dense levels of cosmic energy which eventually coalesced into the physical universe. The realization by ancient Egyptian sages and Greek philosophers that geometric relationships form the underlying patterns of physical reality has been confirmed by modern science. Computer simulations have shown that "holographic fractal geometries" underpin and pervade the entirety of our universe.

The description of physical reality advanced by quantum theory in the early 20th century resonated with certain symbols associated with spirituality. For instance, physicist Niels Bohr suggested that there were strong parallels between the concept of 'complementarity' in physics and the unified duality of the ancient Chinese yin/yang symbol: "In this formulation, yin (matter) and yang (force) appear on an equal footing; each instructs the other. This hints that their apparent duality might resolve into a deeper unity."

Some scientists have employed music as an analogy of the harmony and beauty of the sub-atomic world. Frank Wilczek remarks on the "handful of elegant designs supporting Nature's exuberant constructions," noting that the same mathematical concepts and equations for atoms and light also govern musical instruments and tones:

Our meditation on quantum reality has revealed that the world of everyday matter, when properly understood, embodies concepts of extraordinary beauty. Indeed, ordinary matter is built up from atoms that are, in a rich and precise sense, tiny musical instruments. In their interplay with light, they realize a mathematical Music of the Spheres that surpasses the visions of Pythagoras, Plato and Kepler. In molecules and ordered materials, those atomic instruments play together as harmonious ensembles and synchronized orchestras. (9)

In physics, the standard or "Core" theory shows how the strong, weak, electromagnetic and gravitational forces of nature embody the principles of quantum theory and local symmetry. Their precise and elegant equations form the foundation of many of the sciences, from chemistry to cosmology:

The Core provides a complete, and now battle-tested, mathematical explanation of how subatomic particles combine to make atoms, atoms combine to make molecules, and molecules combine to make materials, and how all those things interact with light and radiation. Its equations are comprehensive, yet economical; symmetrical, yet spiced with interesting detail; austere,

yet strangely beautiful. The core provides a secure foundation for astrophysics, materials science, chemistry and physical biology . . . The world, insofar as we speak of the world of chemistry, biology, astrophysics, engineering and everyday life, *does* embody beautiful ideas. The Core, which governs these domains, is profoundly rooted in concepts of symmetry and geometry. And it works its will, in quantum theory, through music-like rules. Symmetry really does determine structure. A pure and perfect Music of the Spheres really does animate the soul of reality. Plato and Pythagoras: We salute you! (10)

Although some scientists deny the possibility of a 'grand design' or purpose to the universe, there are numerous examples of mathematical patterns and designs in the various phenomena of nature. The mathematical language with which science analyzes the natural world has been characterized by scientists themselves as orderly, balanced, harmonious, and even beautiful. And some scientists point to mathematical design as theoretical support for the notion that the cosmos has a meaningful structure and form:

Despite their belief in randomness, scientists regularly refer to the structure of the atom. Spiral nebulae form a recognizable pattern that one can harmlessly call a design, and with this in mind, the whole messy issue of design-pattern-form-structure can be clarified as follows. The universe owes its existence to the emergence of order from chaos. The wrestling match between form and formless is still with us throughout the universe. Modern physics is based on random processes devoid of purpose and meaning. And yet human life, including the pursuit of science, has purpose and meaning. Where did these come from? Without doubt, the language of mathematics exhibits every quality of design: balance, harmony, symmetry, and some would say beauty. In Chinese calligraphy, the ability to draw a perfect circle with one stroke of the brush is the mark of a master, and art connoisseurs see beauty in the achievement. Electrons, at least for the lowest orbits, travel in a perfect circle around the nucleus of an atom. Isn't that a beautiful design too? The following are all examples of helixes, or spirals, in nature: the shell of a chambered nautilus, the pattern of seeds in a sunflower, and the structure of DNA. Which one qualifies as a design – some, all, or none? A science that depends totally on randomness to explain the universe falls far short. Inside the rational activity of science there is still much to argue over, because intelligence and design are tangled in the same ball of yarn that makes the universe so mysterious. (11)

One of the primary goals of both science and metaphysics is the discovery of an 'ontological order' in the phenomena of nature. In *Quantum Questions*, Ken Wilber writes: "The goal is to succeed in penetrating further into the knowledge of natural harmonies, to come to have a glimpse of a reflection of the order which rules in the universe, some portion of the deep and hidden realities which constitute it." In a sense, science is a celebration of the principles of order, regularity, pattern, design, harmony and beauty. In *Science and the Sacred*, professor of comparative religion Ravi Ravindra eloquently captures this thought: "It is hard to imagine a

scientist who does not see order in the universe, a harmony of the various forces that permit the continued existence of the world, and a pattern involving regularity of phenomena and a generality of laws. The more we know about the universe, the more elegantly and wonderfully well ordered it appears."

Mathematical patterns are universal throughout the natural world, with the same archetypal patterns occurring in many different contexts: "Innumerable patterns in nature have the same explanation: the underlying physical laws are symmetric, and some – though not necessarily all – of those symmetries appear in the pattern. For example, parallel lines of sand dunes in the desert and the stripes on a tiger both arise from the same symmetry-breaking process: one in sand and the other in chemical pigments." Ian Stewart writes in *The Beauty of Numbers in Nature*:

I want to understand all the patterns of nature – not just snowflakes. There are many other puzzles in the natural world: the spiral of a snail shell; the waves that run along the legs of a moving millipede; the serried cells of a honeycomb or a wasp's nest; the multicolored arc of a rainbow; the stripes of a tiger; the jagged slopes of a mountain range; the blue-white sphere of the Earth seen from space; the celestial river of the Milky Way, 400 billion stars of which our Sun is but one; the ghostly cortex of the Andromeda galaxy; the form of the universe itself, and the bizarre physics of the particles from which it is made. Where do nature's patterns come from? What makes them?
(12)

Symmetry is pervasive in nature, creating order and beauty and a sense of wonder. Physicist Stephen Weinberg, speaking of the atomic level, writes: "Although symmetries are hidden from us, we can sense that they are latent in nature, governing everything about us. That's the most exciting idea I know: that nature is much simpler than it looks."

There is abundant evidence in the natural world to support the proposition that the universe is based on order, design and pattern rather than accident and randomness. Astrophysicist Alan Lightman points to the many symmetries in nature as examples of this remarkable feature: "Snowflakes exhibit perfect six-sided symmetry: each fragile branch is identical to the others. Starfish have five equally spaced arms, each like the rest. Jellyfish divide into four identical sectors. The yellow iris has three petals and perfect three-sided symmetry: rotate the flower by one-third of a circle and it comes back to itself. Cut an apple in two, and you will find that its five seeds are arranged in a pentagonal pattern." He then asks a deeper question:

Why does nature embody so much symmetry? We do not know the full answer to this question. However, we have some partial answers. Symmetry leads to economy and nature, like human beings, seems to prefer economy. If we think of nature as a vast ongoing experiment, constantly trying out different possibilities of design, then those designs that cost the least energy or that require the fewest different parts to come together at the right time will take precedence . . . On the

other hand, as far as we know, the symmetries of the electroweak theory and relativity and chromodynamics did not evolve from ongoing experiments with different designs. Rather, they were apparently both in at the origin of the universe, by whatever processes and principles determined the fundamental laws of physics. Some symmetries in nature derive from mathematical theorems and truths. And it is hard to imagine any universe without the order of mathematics and logic. (13)

The findings of science support the notion of an underlying cosmic unity linking life on earth with the greater universe. One of the great themes that runs through the history of science is how it reveals the unity linking human-scale events on earth with cosmic-scale events in the heavens:

Life on earth would not exist but for the features of the distant universe. The elements which compose our bodies were hewn in the stars. The process of evolution is dependent on being fueled by a certain frequency of mutations, which are caused in large measure by the bombardment of life forms by cosmic rays from outer space. Were it not for this invisible, silent rain, life as we know it on earth would not exist. We would not be here now, nor could we continue without the universe around us. Not only are we materially and morphologically tied to the ecology of the universe, the physical behavior of our bodies and all about us is contingent on its large-scale features . . . The physical laws governing each step we take, even the blinking of an eye, are determined by the composition of the cosmos. (14)

In a sense, the interactions between different levels of reality are analogous to the functioning of any biological organism. Dr. Christian Wertenbaker: "An organism is a highly organized, relatively independent entity, in dynamic relationship with its environment. It maintains its form, its life, by selectively taking in the materials it needs and transforming them into its constituents, and excreting things it does not need, or exchanging them for those it does." To grasp the power of the idea of the microcosm governed by the same laws and principles evident in the larger universe, we can study the various levels and cosmic expressions of the natural world. Jacob Needleman captures this in vivid word-pictures:

One thinks of both the long, slow formation of the continents and the instantaneous eruption of a volcano; the birth and death of species that inhabit the earth for millions of years compared with the minute life span of a single-celled organism; the constant movement everywhere of the winds and the stillness of rock and ice. There is the internal harmony of the ecosystem which is yet composed of conflict, mutual killing, fire and storm; there is gradual, subtle growth constantly in process in all things and the sudden destruction brought by earthquake, climatic change and disease; there are all possible movements upward and downward, collisions of fate everywhere at every moment. But more than that, there are the laws that govern all those processes, the intel-

ligence that adapts, reacts, creates and destroys within ever larger and more fundamental scales of intelligence and law. Is this intelligence, this all-penetrating hierarchy of purposeful law, something that is only on the earth? Or does it not pervade the whole of reality? (15)

Not only does the natural world and human realm reflect the greater cosmos, but the microscopic level of reality revealed by quantum physics also interacts with the life of humanity. In *Space, Time & Medicine*, Dr. Larry Dossey argues that the apparent omnidirectional flow of information in the universe implies that the activity of subatomic particles is tied to human behaviour: "We are willing to entertain bidirectional interactions between man and the large-scale features of the cosmos; we are willing to examine how man's consciousness may even shape events in the subatomic world. Are we to refuse to speculate that our day-to-day experience might also bear correlations with what occurs in the subatomic realm?" Dossey expands on this seminal idea:

Is our 'shaping' of the universe directed toward the large-scale aspects of the cosmos, or towards the microscopic realms which we cannot directly perceive? It is likely that our influence extends in both directions. Bell's theorem suggests that conscious human activity influences the behavior of subatomic particles in actual laboratory experiments. But we may shape the mighty events in the universe as well. The implication that human consciousness is a factor in determining the features of the "real" world is affirmed by physicist H.S. Stapp. [He] contends that Bell's theorem is the most important result in the history of science, and that it demonstrates the effect of human consciousness *at the level of the macroscopic*. The impact of our consciousness lies both in the direction of the very small and the very large. The sword of consciousness cuts both towards the galaxy and the atom. In the flowing connectedness that exists across all levels of organization in the cosmos, in which consciousness affects and is affected by events in the universe, it appears as might a mysterious sword in a Zen koan – in the act of cutting, it cuts and is cut at the same time. (16)

Fields, Fractals and Cosmological Constants

Science has come to recognize that each entity and structure in the universe is part of a greater unity, with each part reflecting and interacting with the larger whole: "Each pattern, whether it is a crystal, an organism, a community, a solar system, or a spiral nebula, possesses its own internal order, so that the Universe is recognized as a System of systems, a Grand Pattern of patterns." Biologist Rupert Sheldrake has proposed that the development of all forms and patterns in the universe have their own organizing fields which are derived from an all-encompassing primal unified field:

This process, the energetic flux of the universe, underlies time, change, and becoming, and it seems to possess inherent indeterminism. The energetic flow is organized into forms by fields. Matter is now thought of as energy bound within fields – the quantum matter fields and the fields of molecules and so on. I think there are many of these organizing fields that I call the morphic fields, and that they exist at all levels of complexity. These fields somehow organize the ongoing flux of energy that is always associated with chaotic qualities. Even organized systems of a high level of complexity, such as human brains, have this probabilistic quality. The fields that organize this energy giving rise to material and physical forms are themselves probabilistic. Chaos is never eliminated. There is always an indeterminism or spontaneity at all levels of organization. There are two principles: a formative principle, which is the fields, and an energetic principle. Energy is the principle of change, and pure change would be chaos. One way of thinking of these two principles is in terms of the Indian Tantric notion of *Shakti* as energy and *Shiva* as the formative principle working together to create the world we know. (17)

Sheldrake has also proposed a theory of ‘morphic shape-defining fields’ or influences which govern the development of various life forms. In *A New Science of Life*, he postulated “an invisible matrix or organizing field which regulates the structure, growth, and behavior of all kinds of things. These fields are causative, serving as blueprints or guiding patterns for form and behaviour of entities across time. This capacity is called *morphic resonance*.”

Physicist J.A. Perry places Sheldrake’s concept within the purview of the traditional ‘Great Chain of Being’ description of the universe: “In the holistic context, Sheldrake sees morphic fields as interrelating and coordinating units or holons, which are quasi-autonomous at any particular level but which are part of the greater whole. These entities are hierarchically nested in which fields exist within larger ones, just as domains of being in the Great Chain exist within more embracing ones.” Perry elaborates:

The core principle of morphic fields and morphic resonance is that all forms derive guidance in their growth and development by resonating with the shape-defining fields of their predecessors, the collective archetypal patterns of the species. The evolutionary nature of the fields is implicit in this theory, whereby the current state of development of the species is constantly feeding back into the morphic field. It is an open system of exchange, each constantly influencing the other, and yet despite this, definite and highly particular forms emerge through reinforcement of the fields. In other words, the more often a form takes on a particular shape, the more that shape and field becomes strengthened and entrenched . . . Sheldrake’s fields represent a development in human thought depicting the interaction between the realms of the transcendent and space and time. (18)

Scientists have shown that certain archetypal patterns occur in both simple and complex systems throughout the natural world. The concept of a 'holographic universe' based on archetypal geometric forms confirms the teachings of many ancient schools of philosophical thought:

The ancient sages would have no doubt embraced the concept of a holographically in-formed universe and an underlying order, purpose, and meaning to the Cosmos. In the metaphysical teachings of ancient Egypt and in the Hermetic dictum "as above, so below," they described the holographic "self-similar" mirroring of the manifest world at all scales of existence. And their perception of the One expressed through the diversity of the many is a perfect correlation to the patterns of Nature we are now rediscovering. As the first to reveal these cosmic insights outside the sacred confines of the ancient temples, the Greek sages over two and a half millennia ago intuited deep truths about the universe in numbers and the geometric forms that embody the idealized harmony of the Cosmos. They realized that geometric relationships are universal . . . It has taken a further 2,500 years and the advent of computers to rediscover how profound was the ancient understanding of universal geometric relationships, for the analytic power of computers is now enabling us to see the deceptively simple geometric patterns that underlie the diversity of complex systems. The self-similarity and scale invariance of their fragmented geometric patterns – so-called fractals – are also the basis of holograms. And fractals – the signature of the holographic principle – are being revealed as the basic patterns, the fundamental structures that underlie the appearance of the entire manifest world. (19)

One of the most intriguing scientific developments in the 20th century was the work of mathematician Benoit Mandelbrot, who uncovered universal geometric patterns underlying physical reality. He discovered that 'fractal patterns' are pervasive throughout the universe and reveal the innate harmonic order of the universe. These self-similar patterns are repeated at both small and large scales: "What the repetition of fractal patterning from the smallest to the largest scales show us is that the informational patterns that underlie our Universe embody the minimum information and simplest instructions at all scales to enable manifestation of the maximum diversity and the development and evolution of the greatest complexity." The revolutionary importance of Mandelbrot's discoveries is aptly described in Jude Currivan's *The Cosmic Hologram*:

Unlike many mathematicians, Mandelbrot was fascinated by real-world shapes and had a prodigious ability to perceive the geometric relationships of things and a powerful sense of their underlying order and patterns. In the 1960s and 1970s, by harnessing the power of the early generations of computers to enable the analysis of huge amounts of data, he pioneered the investigation of complex and apparently chaotic systems to discover what lies beneath. After a decade-long study of apparently dissimilar phenomena such as the shapes of coastlines and fluctuations in stock market prices, he was able to discern what

no one had done before him . . . He also discovered that underlying the appearance of such complex objects are simple and self-similar geometric patterns that replicate themselves logarithmically on smaller and larger scales. In 1975 he gave a name to these patterns of reality that he'd revealed: fractals. Fractal geometries embrace and far exceed those of classical forms. Mandelbrot's ground-breaking work, though, showed that beneath the apparent chaos and diversity of complex system there is, as the ancient sages intuited, profound and universal harmonic order. Even more powerful computer analysis is discovering that such underlying fractals pervade our Universe at all scales, and crucially encode their presence not only in "natural" phenomena but throughout man-made systems. Their self-similarity and scaling up and down in logarithmic ratio is also an innate feature of holography and a further signature of the cosmic hologram. (20)

Fractal patterns appear in a myriad of natural phenomena, ranging from microscopic life forms to immense galaxies. "Looking at patterns like trees, for instance, we see fractals of the brain and the circulatory system. Seashells are fractally related to the whorl pattern in flowers, to the ear, to the heart, to the DNA spiral, to the labyrinth, to our galaxy." In *One Mind*, Dr. Larry Dossey highlights the amazing range of phenomena that exhibit fractal patterns:

Fractals have been used to describe partially random or chaotic phenomena such as crystal growth, fluid turbulence, and galaxy formation. Fractal patterns have been found at all levels of nature, such as in clouds, coastlines, snowflakes, crystals, blood vessel networks, ocean waves, DNA, heart rhythms, various vegetables such as cauliflower and broccoli, mountain ranges, river networks, and fault lines. Fractal art is now commonplace, as stunningly beautiful patterns are generated on computers by mathematicians and fractal artists. (21)

Scientists now understand that the features of physical reality are expressions of an underlying cosmic order operating at different scales to guide the development of complexity and diversity in the natural world. Philosopher of science Ervin Laszlo: "Everything is patterned after the universe to which it is connected. The fractal dimensions in nature comprehend both outer and inner natures. Thus, the fractal repetitions of our lives with certain types of events repeating variations of themselves across time." In his recent book *What is Reality?*, he writes:

With the understanding of the ways in which fractal resonance informs the whole, with increased observation of these patterns in both microcosmic and macrocosmic worlds as well as culture, we appreciate the ways in which ancient and indigenous people actually saw this and created symbolic structures that mediated and wove these together in Mandalas, myths, and philosophies. "As above, so below. As within, so without." We have to consider that we are the stuff of photons and other subatomic matter, which compose the most basic properties of information. Our minds and the universe are mirrored realities. Just as matter and space evolved from a tiny dot to a universe of stag-

gering proportions that seem to encompass body, soul, and mind, we too emerged from a pin-size dot of the fertilized egg into an immensely complex system that encompassed body, soul, and mind. Laws of form and emergence govern the genesis of ourselves and the universe: these include order and disorder, growth and entropy, determination and differentiation, and, above all, continuity. These laws are part of the matrix which we call consciousness. (22)

Among the most intriguing findings of modern astrophysics is the mathematical relationship between many of the basic parameters or 'cosmological constants' of the universe. One of the most amazing discoveries is the incredible precision and harmonious unfolding which the initial conditions of the early universe exhibited as it arose from the primordial Big Bang explosion: "The initial conditions of the physical world from the very beginning of space and time, were exquisitely harmonized to enable the evolution of complexity and the creation of life."

Leading physicist Lee Smolin has estimated that from its inception, had the primary forces and physical attributes of our universe varied by more than an unimaginably precise one part in 10^{22} – that's one part in a thousand trillion trillion! – our complex universe of chemistry, galaxies, and biological life could not have evolved. The exquisite harmony of these cosmic relationships include the fundamental ratios between the electrical and nuclear forces that bind atoms and molecules and the vaster weaker force of gravity. Their precisely balanced energies and the exact yet varied nature of their interrelationships, from the moment our universe was born, have enabled the formation and interaction of chemical elements; the birth of stars, galaxies, and planets; and the evolution of biological organisms and ecologies. Without their incredible level of finely tuned precision from the very beginning of space-time, the complex universe we experience could not exist. (23)

Scientists have confirmed that the basic parameters of the universe reflect specific recurring harmonic ratios, suggesting a fundamental coherence. For example, any slight change in the strength of the four primary forces of the universe (electromagnetism, gravity, weak and strong nuclear) would mean that atoms and molecules (including water, oxygen and carbon) as well as amino acids (the building blocks of life) would not form or remain stable.

More than thirty variables (both microcosmic and macrocosmic) are involved in the fine-tuning of the basic parameters of the universe: "Astronomical phenomena such as the formation of galaxies, stars, and planets depend critically on the microphysical phenomena. In turn, those midrange scales, where the known complexity mostly lies, depend on the interacting microscopic and astronomical ranges." Some of the most important cosmological constants are:

- Age of the universe = 13.8 billion years
- Diameter of the universe $R = 10^{22}$ meters
- Speed of light $c = 299,792$ kilometers/second

- Gravitational constant $G = 6.67 \times 10^{-11} \text{ Nm}^2/\text{s}^2$
- Planck constant $h = 6.62606957 \times 10^{-34} \text{ seconds}$
- Ratio of strength of electromagnetism to strength of gravity = 10^{36}
- Ratio of the size of the universe to the size of elementary particles = 10^{26}
- Size of the electron $r_0 = 2.8 \times 10^{-15} \text{ meters}$
- Number of nucleons in the universe = 2×10^{78}

An example of the “astounding coincidences” discovered in the harmonic ratios between certain of the universal parameters is shown by the longest wavelength (λ) of the microwave background radiation – the remnant of the Big Bang. λ divided by the speed of light (λ/c) is equal to the age of the universe. And when λ is squared and divided by the speed of light (λ^2/c), it is equal to the acceleration in the expansion of galaxies. The fact that the physical laws and cosmological constants governing the evolution of the universe are remarkably precise, suggests a high level of coherence and unification at all levels of reality:

Perhaps the most remarkable evidence for the coherence of the cosmos is the observed “fine-tuning” of its physical constants. The basic parameters of the universe have precisely the value that allows complex structure to arise. The fine-tuning in question involves upward of thirty factors and considerable accuracy. For example, if the expansion rate of the early universe had been one-billionth less than it was, the universe would have re-collapsed almost immediately; and if it had been one-billionth more, it would have flown apart so fast that it could produce only dilute, cold gases. A similarly small difference in the strength of the electromagnetic field relative to the gravitational field would have prevented the existence of hot and stable stars like the Sun, and hence the evolution of life on planets associated with these stars. Moreover, if the difference between the mass of the neutron and the proton was not precisely twice the mass of the electron, no substantial chemical reactions could take place, and if the electric charge of electrons and protons did not balance precisely, all configurations of matter would be unstable and the universe would consist of nothing more than radiation and a relatively uniform mixture of gases. (24)

Because the universe as a whole is a complex, coherent system and its parameters are harmoniously related, the evolution of living systems, ranging from cells to galaxies, is actually possible. In *The Intelligence of the Cosmos*, Ervin Laszlo explores the implications of this fact:

The coherence of the parameters of the universe is extremely precise: variations on the order of one-billionth of the value of some constants (such as the mass of elementary particles, the speed of light, the rate of expansion of galaxies, and some two dozen others) would not have produced stable atoms and stable interaction among the atoms. Already a minute variation of some of the physical constants would have precluded the evolution of the coherent

systems we call living. The fact is that living systems are astonishingly coherent. In our body, molecules, cells, and organ systems resonate at the same or at compatible frequencies and interact at various speeds . . . The interactions are precisely correlated, involving quantum-type “entanglements” in addition to classical physical-biological interactions. The universe is highly coherent in itself, and it has brought forth highly coherent systems. Many systems possess a remarkable measure of intrinsic as well as extrinsic coherence. “Intrinsic coherence” means that the parts that make up the system are finely tuned together, so that every element is responsive to every other element. “Extrinsic coherence” in turn means that the systems are coherently connected to other systems around them. Evolution in the universe exhibits a drive or tendency toward creating intrinsically as well as extrinsically coherent systems. (25)

Archetypes and Higher Worlds

The concept of a higher realm that is the repository of universal archetypes embodying pure forms or patterns can be traced to ancient Greek philosophers. Pythagoras discovered a fundamental relationship between numbers, geometric shapes and beauty which he called the “Music of the Spheres.” Parmenides envisioned a changeless, deeper reality which is eternal and unchanging, and provides the source of all phenomena. Plato believed that everyday life was a pale reflection or shadow of a perfect, absolute reality: “There is an eternal, timeless world of Ideas, Beauty and Truth, which exists prior to and independent of any necessarily imperfect, physical embodiment of them. A restless, artistic Intelligence – the Artisan – molds his creations from ideas, using them as templates.”

The intuitions of Pythagoras and Plato that nature has a beautiful simplicity of order is given poetic expression by author Guy Murchie in his *Music of the Spheres*: “The world is made of abstraction with sinews of perspective – and music. Its waves gather knowledge and instruct the universe. Its melody is more than notes, its poetry more than words. Its stars are as much seeds of distance as earthly acorns are seeds of time.”

The concept of the five ‘Platonic Solids’ is a cornerstone of Plato’s visionary philosophy:

Plato, who was tutored by Socrates and himself trained Aristotle, taught in the fourth century BCE that the material world is underlain by nonphysical and abstract forms – transcendent archetypes. In the five three-dimensional solids named after him, such idealized templates were deemed to find physical expression. The five Platonic solids – tetrahedron, cube, octahedron, dodecahedron, and icosahedron – are the *only* three-dimensional solids possible whose sides, faces, and inner angles are the same. So, for example, the four faces of a tetrahedron are made up of four same-size equilateral triangles, the six faces of a cube by six same-size squares, and so on. All five solids can nest within each other and with their vertices all touching a single encompassing sphere. Rota-

ting them through different angles and seeing them from different viewpoints creates a further wealth of transformations and reveals additional harmonic relationships between these fundamental forms. Perfect indeed. (26)

The Platonic Solids embody the Golden Proportion (ϕ) and reflect the relationship between humanity and the greater universe: "The rectangles, triangles, arcs, and spirals inherent in the proportions and volumetric forms of the Platonic Solids provide all the design elements to bring harmony and resonance to human life."

The Golden Proportion is closely tied to the Platonic solids, so named from their appearance in the famous dialogue *Timaeus*, in which Plato employed these geometric shapes to describe the fundamental laws of the universe. The Platonic solids are defined geometrically as solid figures which divide the surface of a circumscribed sphere into like and equal parts. By this definition, it proves impossible to divide the surface of a sphere into more than these five solids. The clearest relationship between the Golden Proportion and the Platonic solids are manifested in the dodecahedron. With its 12 faces, 20 vertices (points of converging lines) and 30 edges, the dodecahedron is constructed of pentagons, the five-sided figure which displays in its construction the relationship upon which the Golden Proportion is based. Further, the beauty of the relationships among the solids, with their Golden Proportion ratios, is most awesomely revealed when the five solids are placed one inside the other in a maze-like construction. The maze illustrates the symbolism of unity inherent in the solids. All the points, all the vertices, and all of the corresponding faces reveal each solid's connection to the others. In the seeming confusion of the lines and points, the unity emerges in a complex harmony illustrative of the harmony which is possible in the multiplicity of creation. (27)

Plato related the five Platonic Solids to humanity's striving for perfection and unity with the cosmos: "The symbolism of the five solids points to the idea that there is within the human being the spark of divinity which forms our intimate link with the laws of the universe."

We are not separate from natural phenomena, only from our own nature when we deny this inner relation and harmony. Eastern traditions associate the icosahedron with Brahman, the cause; and the dodecahedron with the manifest universe, or the effect. These rays or emanations give birth to the octahedron, symbolic of the essence or consciousness, which in turn gives birth to the interlacing tetrahedron, which is symbolic of man's place in the order of the universe. Finally, the cube represents the entire manifest universe, including humanity. (28)

In the Middle Ages, the Italian polymath Galileo was inspired by the beauty of the physical world which he believed reflected God's splendour and magnificence: "The greatness and the glory of God shine forth marvellously in all His works, and is to be read above all in the open

book of the heavens." His contemporary, Johannes Kepler, also felt a great communion with nature and believed that number and geometry were the underlying archetypes of the beauty of the world.

One of the major tenets of the Western esoteric tradition, articulated by both William Blake and Emanuel Swedenborg, is that what is truly infinite and eternal is not *outside* but *within* the human psyche. And more recently, philosopher Henry Corbin speaks of the creative energy of the cosmos as the *mundis imaginalis* – a world of archetypes, forms, images and intelligences that are perceptible to human beings in higher states of consciousness. Scholar Seyyed Hossein Nasr agrees: "There is within man a reality which itself is the archetype of the cosmos. In every tradition which has preserved its inner, esoteric teachings there is an allusion to this."

Archetypes are universal, collective images, symbols and themes which occur in dreams, fantasies, art, literature and mythology. Carl Jung believed that they are derived from the accumulated, collective experience of humanity over the span of thousands of years. "An archetype is a nonspatial, nontemporal repository of a certain basic human experience. The totality of thought-fields, or archetypes, constitute an 'atmosphere' of thought energy which extends through our planet's physical atmosphere but goes beyond it and can be understood as what Jung called the collective unconscious."

Jungian psychologist Ira Progoff situates archetypes in the context of a higher Self which is simultaneously immanent and transcendent:

The Self is the archetype of all the archetypes that the psyche contains, for it comprehends within itself the quintessential purpose behind the impersonal archetypes and the archetypal process by which the ego and consciousness emerge. The Self may be understood as the essence and aim and living process by which the psyche lives out its inner nature. As such the Self can never be contained by the ego or by any of the specific archetypes. Rather, it contains them in a way that is not limited by space or time . . . It involves something that can be spoken of as a nonphysical continuum by means of which the correspondences within the cosmos, the microcosm and the macrocosm, can come together to form patterns, at once transcendent and immanent, and constellating situations that draw physical as well as psychological phenomena into their field. (29)

Jung also proposed that a higher or deeper reality (the *unus mundi*) underpinned both body and mind and connected human minds with each other as well as the natural world. By examining the world's legends, myths, and folktales he found underlying common elements, which he termed humanity's "collective unconscious." He stressed the importance of this in the collective experience and destiny of humanity:

The collective unconscious has both a historical aspect and an archetypal aspect. The historical aspect consists of experiences accumulated by human

beings throughout history: these experiences have entered, and are conserved in, the collective unconscious of humankind. Archetypes are the dynamic principles that organize their manifold elements. They are irrepresentable in themselves, but have the effects that make visualizations possible. Archetypal ideas do not merely repose in the historical dimension of the collective unconscious, but can become part of the waking consciousness of individuals. The collective unconscious, the same as other transpersonal phenomena, is evidence that our mind is not an isolated entity but is constantly in touch with other minds as well as with the world around us. We are never entirely detached from the outside world; never entirely enclosed within our skin. Our mind and body resonate with the world, and when we do not repress the intuitions that link us with other people and with nature, we can become aware of our oneness with the universe. (30)

In *Adventures in Afghanistan* traveller Louis Palmer describes his contact with a Sufi community whose operation included the production of various carpets, artefacts and works of art, “whose size, shape, colour and design served an unspecified but allegedly highly important and recognizable spiritual cause. Each one was planned, had a spiritual use and could cause an effect unsuspected by anyone who was not sensitive to it.” The crucial factor in the efficacy of these objects is their design or pattern which mirrors a larger cosmic design. In a sense, they ‘unveil’ something already existing on another plane of reality:

These people were convinced of the existence and active operation of what I can only call a series of underlying, cosmic patterns, influencing both life and inanimate objects. Something, they believed, exists for our perceptions only as a local manifestation of an outside force which has called it into being. Things, therefore, as well as thoughts, exist only because they have, somewhere, transcendental archetypes . . . The theory is that there is a realm where most of the things we know are existent in the form of a design. This manifests itself in the world. Some people can make it manifest more concretely. They can also go beyond the design, and find out what planted it in the first place . . . Beyond the design hides the True Reality. (31)

Throughout history, philosophers and mystics have spoken of a dimension of reality which is “hidden” from direct observation: “Ever since the beginning of human thought, peoples from across the world have considered themselves immersed in invisible realms which played an important, active, and often crucial part in their day to day affairs.”

This deep dimension is eternal and unchanging, beyond time and space, yet supporting the world of phenomena that we perceive with our senses. From this perspective, the world of created things is only a reflection of an invisible higher world. Pythagoras called it the “Kosmos” and described it as a trans-physical ground from which matter and mind emerge. To Plotinus it was the “One.” In Indian philosophy, the *Lankavatara Sutra* speaks of a “causal dimension”

that gives rise to physical reality. In North America, the Iroquois believed that everything on earth has an “elder brother in the sky realm.”

In Sufism there is a saying that “the Relative is a channel to the Real,” suggesting that the phenomenal world of objects and processes is a secondary, relative and incomplete manifestation of the Absolute: “Crude, terrestrial things have subtle, refined ‘celestial equivalents.’ True Reality exists in other dimensions than our own, but its local form, an approximation, leading us to it, is manifested everywhere.”

According to Sufi teachings, objects and events have both an outward significance and an inner meaning. Nothing is truly accidental or isolated. However, most people, lacking inner spiritual sensitivity, only perceive the outward appearance and function of things. “Everything on Earth exists because it has an origin in another dimension, where that thing is perfect, where the multiplicity of forms is perceived and understood as a unity.”

There is an ‘other dimension’ which co-exists with the phenomenal world we perceive with our senses: “Beyond the world of time and space, there is a ‘higher realm,’ which is the world of Real Being. What we call terrestrial happenings are similitudes of ‘real events’ which belong to the higher world.” In *Tales of the Dervishes*, Sufi author and teacher Idries Shah writes:

The Sufis believe that the ‘invisible world’ is at all times, at various places, interpenetrating ordinary reality. Things which we take to be inexplicable are in fact due to this intervention. Furthermore, people do not recognize the participation of this ‘world’ in our own, because they believe that they know the real cause of events. They do not. It is only when they can hold in their mind the possibility of another dimension sometimes impinging upon the ordinary experiences that this dimension can become available to them. (32)

A corollary of this concept is that certain inexplicable events – such as a long succession of coincidental and favorable (or unfavorable) happenings involving a human being or even a community or nation – may have their origin in a ‘hidden dimension.’ Shah alludes to this in *World Tales*: “People and events do not exist in isolation. There is the stream of destiny, which has its own plans, which themselves interlock with the fate of others. Things turn out well when the opposite is expected and vice-versa; the results of actions cannot be predicted only from expectation.”

Certain events in the world cannot be logically explained, only *experienced*. Some spiritually developed individuals can enter and operate in another, extra-dimensional, reality or world by harmonizing with ‘divine intention.’ “There is another ‘world’ or system which can cause changes in this dimension which are utterly inexplicable in ordinary terms. There are also explicit rules connected with such phenomena which have to be observed.” One of the purposes of an authentic spiritual teaching is to develop an awareness of the hidden dimensions and concealed patterns operating in life. Idries Shah presents a Sufi parable which illustrates this principle:

Our teaching speaks of, and exists partly in, 'another world,' a 'higher realm,' a 'different dimension.' Here is a parallel of what this means, in one significant way, and what the object of the Teaching is:

THE UNKNOWN CEILING

Suppose we have a house with walls, ceilings, floors, and we are inside that house. Let us say that through long-established custom, people can touch and deal with only the floors and walls. If someone were to walk in and say: 'Look at the ceiling,' the people would be incapable of doing so – rather like a child which often cannot see something, certainly cannot observe it, unless it has been demonstrated to it. Suppose further, that the custom of generations was to hang things on walls and not to have anything on the ceiling. Objects on the ceiling might then be 'invisible' to the people at large. So it is with our teaching. We frequently and abundantly assert that people do not think things through, that they make assumptions (such as 'there is no ceiling') which they do not attempt to verify. But, like the intelligent person who would be trying to point out the existence of the ceilings, we do more than constantly draw attention back to the theoretical postulate ('there may be ceilings'). We provide, in instructional courses, meetings, contact with teachers, observation materials, exercises, call them what you like, the practical means to establish and maintain for the community which is being addressed the experience of the existence of 'ceilings.' (33)

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