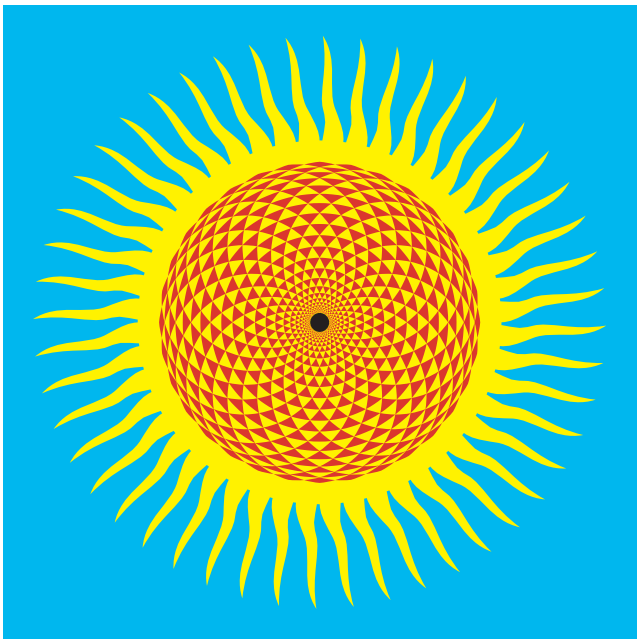
Coordinating Framework for Dialogue

The Four Spheres

Healing the Split between Mysticism and Science



Paul Hague

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Healing the Split between Mysticism and Science

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Symbol of Coherent Light of Consciousness on front cover programmed in Postscript by the author from an idea of the University of the Trees.

For
all children everywhere, born and yet to be born, for you are destined
to be carried to evolution's glorious culmination in
the much longed-for Age of Light

The Mystical Whole

He who knows does not speak.
He who speaks does not know.
Block all the passages!
Shut all the doors!
Blunt all edges!
Untie all tangles!
Harmonize all lights!
Unite the world into one whole!
This is called the Mystical Whole,
Which you cannot court after nor shun,
Benefit nor harm, honour nor humble.
Therefore, it is the Highest of the world.

Tao Teh Ching
Lao Tzu (Laozi)
(Tr. John C. H. Wu)

Imagine

Imagine there's no heaven
it's easy if you try
no hell below us
above us only sky
imagine all the people
living for today …

Imagine there's no countries
it isn't hard to do
nothing to kill or die for
and no religion too
imagine all the people
living life in peace …

You may say I'm a dreamer
but I'm not the only one
I hope someday you'll join us
and the world will be as one

Imagine no possessions
I wonder if you can
no need for greed or hunger
a brotherhood of man
imagine all the people
sharing all the world …

You may say I'm a dreamer
but I'm not the only one
I hope someday you'll join us
and the world will live as one

John Lennon
(1940–1980)

Contents

About the author

Paul Hague was born near London in the middle of the Second World War, early disquieting experiences that led to a lifelong search for Love and Peace, Wholeness and the Truth, and Life and Freedom. After being educated mainly as a mathematician, he then spent his business career in the information technology industry, primarily with IBM in sales and marketing in London in the 1960s and 70s and in software development in Stockholm in the 1990s, when he took early retirement.

In 1980, as the Information Society was being born, he saw that the global economy holds the seeds of its own destruction within it and that his children were not being educated to live in the world that would exist when they came to have children of their own. Most significantly, he realized that the computer—as a tool of thought—cannot be understood within the context of materialistic, mechanistic science and monetary economics.

Being concerned about our ignorance of what is causing scientists and technologists, like himself, to drive the pace of evolutionary change at exponential rates of acceleration, he resigned from IBM to investigate the long-term psychological and economic implications of society's growing dependency on information technology.

The trigger for this radical change of direction in his life was a life-changing epiphany on 27th April 1980, when, in an apocalyptic eureka moment, he realized that nonphysical, mental, synergistic energies are driving the pace of change in society at unprecedented rates of acceleration. Accordingly, he set out to develop a coherent, self-inclusive map of the Cosmos that would unify the psychospiritual energies acting within us with the four physical forces recognized by materialistic science.

Specifically, to realize the abundant potential of human intelligence, beyond the constraints of artificial general intelligence, Paul imagined that he was a computer that had the task of integrating all knowledge in all cultures and disciplines into a coherent whole without an external human designer to tell it how to do this. Working in solitude, with only the Divine power of Life and Heraclitus' Hidden Harmony for guidance, this computer had the assignment to program itself to develop the Theory of Everything, a coherent body of knowledge that can explain all our experiences, from the mystical to the mundane.

As a consequence of Paul's awakening thought experiment, he has realized that opposites do not exist in Nonduality and Wholeness, fulfilling a childhood dream to end the long-running wars between science and religion and between all the religions, necessary if we are to live in love, peace, and harmony with each other and our environment.

Preface

The principal purpose of this book is to complete the revolution in science currently unfolding, answering a host of questions that cannot be answered within the framework of Western civilization. The most critical of these unanswered questions is "What is causing scientists and technologists, aided and abetted by computer technology, to drive the pace of scientific discovery and technological development at unprecedented exponential rates of acceleration?"

To solve this unsolved problem, we need to acknowledge the existence of psychospiritual energies, which create our reality and cause us to behave as we do. By unifying mystical psychology and holographic mathematical logic—as sciences of the mind, reason, and consciousness—we can then integrate the nonphysical and physical energies at work in the Universe in a coherent body of knowledge, which physicists call the Theory of Everything.

However, this cannot be done within the fragmented cognitive structures provided by materialistic, mechanistic science and monetary economics. Scientific theories and how they are formed lie outside the domains studied by physicists, chemists, and biologists, as natural scientists. Neither can this puzzle be solved within the mathematical, logical, and philosophical constraints that Plato, Aristotle, and Euclid imposed on Western thought some 2,350 years ago. To be aware of what is causing us all to behave as we do, we also need to be free of the beliefs laid down at the Council of Nicaea in 325, when the founding fathers of Christianity denied humanity's Divinity, except in the figure of Jesus of Nazareth, although Arians, like Isaac Newton, even denied this.

To understand what is happening to humanity, we need to see the rapid changes that are unfolding today in their Cosmic Context. For evolution is presently passing through the most momentous turning point in its fourteen billion-year history, called its Accumulation Point in systems theory terms—a ground-breaking, epoch-making mathematical and spiritual Singularity in time.

This means that there is no one on Earth who is unaffected by the far-reaching transformation of consciousness and culture that is happening at the moment. We are all involved, for in Reality, none of us is ever separate from any other or the Divine for an instant, an understanding that is realized when we heal the deep split between humanity and the Divine. As the Proto-Indo-European (PIE) roots of *human* 'earthling' and *Divine* 'Shining' indicate, this split opened up many thousands of years ago, getting ever wider throughout the world in recent centuries, as Western secular thought has spread Eastwards, suppressing the ancient wisdom of India, China, and Japan.

For works like the *Upanishads* of Advaita 'Not-two', Laozi's *Tao Te Ching* '*Great Book of the Way of Virtue*', and the *Avatamsaka Sutra* '*Flower Ornament Scripture*' of Huayan and Zen Buddhism are wonderful expressions of the Divine, Cosmic understanding that we all have the potential to share, but which the Western analytical mind little understands. We can only understand the history of Western

science and philosophy from an Eastern mystical perspective, with what Aurobindo called an undivided 'Supermind', not the other way round.

Of course, not everyone is enslaved by the cultures they are born into. Throughout human history, a number of outsiders have emerged, questioning the assumptions passed on to us as children in school and church, sometimes suffering greatly as a consequence.

One such freethinker was Heraclitus of Ephesus, the Pre-Socratic mystic and philosopher of change, one of the wisest men in human history, called the 'Obscure' by his contemporaries. Another rebel was the popular Dominican monk Meister Eckhart, the pre-eminent Christian mystic, who was found guilty of heresy in 1329 for affirming his Divinity and would no doubt have been burnt at the stake like Giordano Bruno in 1600 if he had not died before the prescribed sentence could be carried out. I mention these gentlemen in particular because even today the mainstream of Western thought does not share their mystical experiences and hence does not accept their profound ideas.

However, not all outsiders are equally well known. As Arthur Koestler eloquently put it in *The Act of Creation*, "The history of science has its Pantheon of celebrated revolutionaries—and its catacombs, where the unsuccessful rebels lie, anonymous and forgotten." For myself, the kindred spirits who have most inspired me in my lifelong quest to understand what the Universe is and the Grand Design of the Cosmos are Heraclitus, Johannes Kepler, John Amos Comenius, George and Mary Boole, Ada Lovelace, Charles Sanders Peirce, Carl Gustav Jung, Pierre Teilhard de Chardin, Erich Fromm, Joseph Campbell, Arthur Koestler, and David Bohm. And spiritually, understanding what it truly means to be a human being, Ramana Maharshi, J. Krishnamurti, Vimala Thakar, Ramesh S. Balsekar, and Osho have been my most inspiring teachers.

◇

Most significantly, Peirce's triadic architectonic and studies in mathematical logic led Ted Codd of IBM to write an 11-page paper in 1970 prosaically titled 'Relational Model of Data for Large Shared Data Banks', which unified the hierarchical and nonhierarchical ways of organizing databases in the 1960s. I first read this seminal paper in 1972, when designing database systems in an IBM sales office in London as a systems engineer. I knew at once that it was the most significant paper in the entire history of the data-processing industry, for it described the underlying structure of data—the basic resource of the industry—in mathematical terms. However, I did not follow my curiosity about the relational model at the time for I was more interested in working with people as a manager than with machines.

In the event, it was not until 1980—when I set out to investigate human intelligence vis-à-vis so-called artificial intelligence—that I began to recognize the full power of Codd's pioneering insights. As I can see today, and as Codd himself mentioned in his paper, the relational model of data is nondeductive, unlike the linear forms of reasoning we have inherited from Aristotle and Euclid.

Nonlinearity is necessary because while threads in computer programs execute instructions sequentially, when viewed as a whole, the Internet has a nonlinear structure—both hierarchical and nonhierarchical. So, as not too many people know today, the relational model of data introduced the most fundamental change in Western thought since the ancient Greeks, spawning a multibillion-dollar industry. You cannot order a book or airline ticket on the Web today without invoking the relational model behind the scenes.

The leader of the database industry is Oracle, founded by Larry Ellison, who was the first entrepreneur to see the commercial potential of Codd's arcane paper. Today, he is the fifth richest person in world, according to Forbes, and the thirty-seventh most influential person, accordingly to Business Insider.

Twice, Larry Ellison has used his great wealth to win the America's Cup, the most prestigious prize in yachting.

Yet, as this book explains, we can also use the relational model to find God, that is Love, Peace, and Truth, which have no opposites. For an original meaning of *wealth* was 'spiritual well-being', on the analogy of *health*. And the relational model enables us to be both wealthy and healthy in spiritual terms. There is no need to compete with anyone, for there is no other in Wholeness.

The Internet thus gives us the wonderful opportunity to heal our split minds, which have become fragmented because of academic specialization and the division of labour in the workplace. For this ubiquitous, global network contains a multicultural, multidisciplinary body of knowledge and information applicable in any industry whatsoever. This universality arises because the underlying modelling methods that information systems architects use to build applications and databases on the Internet are of great abstraction and generality, applicable in all cultures, industries, and disciplines. They are holographic and fractal-like, possessing the property of self-similarity. If this were not the case, the Internet could neither exist nor expand at hyperexponential rates of acceleration.

We can thus use the Internet as a mirror for our inner thought processes, enabling evolution to become fully conscious of itself within us human beings. In this way, we can bring our mystical experiences into business, consummating the sacred marriage between science and spirituality, a blessed union that is essential for World Peace. Yet, there is really nothing new here; it is just simple commonsense. For millennia, we humans have sensed the Presence of the Immanent, Transcendent Divine within and around us, but have struggled to make sense of our mystical experiences with systemic, rational thought. So when we view the Internet as a mirror of our cognitive maps, we can see that it is a resource that we all share in the depths of our beings, no matter what our unique, but superficial cultural and individual differences might be.

This might seem rather idealistic given the chaotic state of the world today. Yet it is absolutely essential that we endeavour to rise above the level of our machines, free of our mechanistic conditioning, because Stephen W. Hawking, one of the most influential scientists in the world today, said to the BBC in 2014, "The development of full artificial intelligence could spell the end of the human race," needlessly generating much existential fear. Unnecessary because this prospect for the future of humanity would perhaps be realizable if we humans were machines and nothing but machines. But we are not. We are all Divine, Cosmic beings, who have lost touch with our True Nature because of the way that evolution has unfolded during the past several thousand years.

More than any other single factor, what is inhibiting us from fulfilling our immense potential as a superintelligent, superconscious species is Aristotle's Law of Contradiction, which states, "It is impossible for the same attribute at once to belong and not to belong to the same thing and in the same relation, … as some imagine Heraclitus says." In contrast, Heraclitus said in the few fragments of his writings that have survived, "The Hidden Harmony is better than the obvious," and "Opposition brings concord; out of discord comes the fairest harmony."

The Law of Contradiction denies the existence of paradoxes and self-contradictions, which is absurd for the Universe is full of them. For instance, physicists have observed that light has the properties of both a particle and a wave, which Niels Bohr called 'complementarity', which is reassuring. Complementary pairs of opposites feel much more comfortable than contradictory ones.

A prime example of a self-contradiction is the self-referencing statement, "This sentence is false," contradicting and falsifying the Law of Contradiction. So rather than denying the existence of such phenomena, what the Western mind seeks to do is eliminate self-contradictions from reasoning on the assumption that allowing them in would invalidate rational thought. But because the territory that science studies is full of paradoxes, the effect is that the cognitive maps and conceptual models we create of the world we live in are incomplete and deluded, leading us dangerously astray in our journeys in life.

From a social perspective, the Law of Contradiction encapsulates the one-sidedness of Western thought that has afflicted this great civilization for hundreds of years, leading to much conflict and suffering. In contrast, when we learn to see both sides of any situation, then inner Peace and Harmony is a natural concomitant. So at the heart of the great revolution in science taking place today is a paradigm change from conflict-ridden, either-or thinking, which Carl Gustav Jung aptly described as "a mark of barbarism", to a harmonious, cooperative both-and system of thought and way of life.

Before I discovered Heraclitus and Aristotle, the Hidden Harmony was revealed to me around midsummer 1980, shortly after resigning from my marketing job with IBM in London in order to investigate the root causes of the changes in society that scientists and technologists like me were and still are introducing. At the time, I called the Hidden Harmony the *Principle of Duality*, a generalization of the principle of duality in projective geometry, where points and lines are interchangeable—duals of each other. The Principle of Duality states, *A complete conceptual model of the Universe consists entirely of dual sets*.

Set is the most fundamental of all mathematical concepts, for we cannot understand the concept of the number three until we understand the concept of set, as teachers of the 'new maths' in primary and elementary schools in the 1960s well recognized. Tragically, this initiative was then abandoned in order to meet the numerical needs of science and economics, a lost opportunity for children to become conscious of how they rationally recognize patterns and form concepts at the heart of logic and semantics.

Then, in October 1983, I formed the concept of the Formless Absolute in exactly the same way as I form concepts in the relativistic world of form. The Principle of Duality became the *Principle of Unity*, which states *Wholeness is the union of all opposites*, the fundamental design principle of the Universe, the key that unlocks all its innermost secrets. This irrefutable universal truth has thus enabled me to heal the split between mysticism and science, a marvellous realization that is impossible to describe in words.

Nevertheless, I feel that I should endeavour to do so, conveying my great joy to the best of my ability. One challenge here is that as there is no limit to the number of opposites at work in the Universe—both complementary and contradictory—the Principle of Unity has universal applicability, relevant within any domain of discourse whatsoever. It might therefore seem that it would take many lifetimes to unify all these opposites in Wholeness.

However, when we use the Hidden Harmony to heal the deep split between humanity and Divinity, rather like the union of *samsāra* 'journeying' and *Nirvāna* 'extinction' in Buddhism, all other tensions between opposites simply dissolve in the Bliss of Consciousness. We then become fully alive, with no separation between life and death, viewing our lives in the context of the mystical worldview.

It is from the Formless Absolute—as the Divine Datum of the Cosmos—that the entire relativistic world of form emerges, like waves and currents on and beneath the surface of an ocean, never separate from the ocean itself. This union of form and Formlessness is the Ocean of Consciousness, the centre of which is Love, the Divine Essence we all share, providing the Cosmic Context for all beings in the Universe, including all of us human beings.

In scientific terms, we then realize that the concept of universe that governs science today is false. The entire physical universe arises from Consciousness, not the other way round. Consciousness is Ultimate Reality; physical universes and their components, including the brain, emerge from Consciousness; all beings in the manifest Universe are related to each other, never separate from God, Nature, or any other being for an instant.

But this is not a paradigm change or shift in the meaning of Thomas Kuhn in *The Structure of Scientific Revolutions*. For *paradigm* means 'pattern' or 'model', and Consciousness is not a pattern. It is a seamless, borderless continuum with no divisions anywhere. So the scientific revolution we are engaged in today is a contextual inversion, guided by a paradigm change from either-or to both-and thinking.

From this mystical worldview, we can then admit nonphysical, psychospiritual energies into science, as the complement to the four physical forces recognized by materialistic science. This is absolutely essential if we are to intelligently manage our business affairs with full consciousness of what we are doing. For our minds create our reality and, for a great part, govern our behaviour.

This book has evolved from the Hidden Harmony, arising directly from the Origin of the Universe, as the Divine Source of Life. To explain this integral, holistic way of looking at the world we live in, since 1980, I have read or browsed through thousands of books on every subject under the sun, trawled the Internet, and written many hundreds of thousands of words describing how I see the Universe from a unifying both-and perspective in contrast to traditional divisive and analytical ways of thinking.

In essence, all these expositions are expressions of Wholeness, which has neither a beginning nor an end, making communications a little tricky. In this dissertation, the approach I have taken is to present the cosmology of cosmologies I have been working on for the last thirty-five years in terms of Four Spheres, inspired by the four stages of evolution that Pierre Teilhard de Chardin, the Jesuit mystic, palaeontologist, and geologist, distinguished in *The Human Phenomenon*.

I call the Four Spheres the Numinosphere, noosphere, biosphere, and hylosphere, corresponding in reverse order to the physical, biological, mental, and spiritual stages of evolution during the past fourteen billion years, since the most recent big bang, which supposedly brought our particular physical universe into existence. I say 'supposedly' because today I experience the Cosmos we all live in as *Satchitānanda* 'Bliss of Absolute Consciousness', quite different from the concept of universe that I was taught to study in physics in high school in the 1950s.

Conventionally, specialists, such as theologians, psychologists, biologists, and physicists, study the Four Spheres. However, such demarcations do not enable us to see the Big Picture, how all the various branches of human learning fit together into a coherent whole. To create a synthesis of all knowledge in all cultures and disciplines at all times, we need to stand outside ourselves as generalists.

I call this transcultural transdiscipline Panosophy, which John Amos Comenius, the 'father of modern education', developed and promoted in the seventeenth century with a slightly different spelling. As a panosopher, I see myself as an information systems architect, who works with specialists in various departments to develop coherent business systems to ensure the smooth running of enterprises, maximizing their efficiency and the effectiveness of decision making. As the job title indicates, information systems architects are the master builders in business, able to see how all processes and entities relate to each other in order to meet the needs of the organization.

Most significantly, if information systems architects are to develop business systems that replace as many expensive human jobs as possible with cheaper machines—in accordance with the economic imperative of our times—they need to include their own semantic modelling processes in the territory that is being mapped, rather like a television camera filming itself filming. In this way, it is possible to determine whether machines with artificial general intelligence could do the job of information systems architects in business.

It is vitally important that we solve this problem, for if computers could do the job of software developer without human intervention, this would create mass unemployment, leading to the collapse of the global economy. And if not, this would mean that machines are limited in some way and that technological development cannot drive economic growth indefinitely, with a similar effect. So do humans or machines lie at the leading edge of evolution?

We can answer this question by invoking Self-reflective Intelligence, the Divine quality that distinguishes humans from the other animals and machines, like computers. By applying what some call the Witness in spiritual circles, we can then develop a comprehensive model of the psychodynamics of the entire species, answering the Big Questions of human existence, such as who we are, where we have come from, and where we are all heading in the most frantic rush.

This is one of several ways of demonstrating that superintelligent machines will never be able to run our business affairs without human intelligence. For if they could, they would need to program themselves to model their own programming activities. Furthermore, they would be able to write this treatise without human, that is Divine, intervention, which this book demonstrates is not possible.

Similarly, from an academic perspective, I am not a specialist in any field of learning, not even in mathematics and computer science, in which I was educated and trained. My principal skills as an autodidact are in abstract thought, which enables me to know and understand myself, viewing the unifying patterns and relationships underlying the Cosmos from a Holoramic 'Whole-seeing' perspective. I have thus been able to use the modelling methods that underlie the Internet as the coordinating framework for what physicists call the Theory of Everything.

That is why this composition is marked 'Coordinating Framework for Dialogue'. No individual in a single lifetime can develop proficiency in all walks of life. All we can hope to achieve is to see how our particular propensities fit into the overall scheme of things. I therefore trust that this book on *The Four Spheres* could assist specialists in various disciplines to view their conceptual models within a broader and deeper perspective than perhaps they are used to. In return, maybe specialists could help me to correct any errors of interpretation that I have made in this treatise, recognizing that there are often many different ways of interpreting the data patterns of experience.

However, reading learned treatises is not sufficient for us to realize our fullest potential as a species in the eschatological Age of Light and Mystical Society before our inevitable extinction. Ongoing face-to-face communications is absolutely essential if we are to mirror each other in our awakening, healing, and liberating activities. Accordingly, I feel that the healthiest way for me to serve our children and grandchildren in my old age is to set up the Alliance for Mystical Pragmatics. The principal purpose of the Alliance, whose motto is 'Harmonizing evolutionary convergence', is to put the awakening of Divine Love, Cosmic Consciousness, and Self-reflective Intelligence at the top of the social agenda, following the maxim that seven wise men inscribed on the temple of Apollo at Delphi: "Know thyself."

We know this because Plato told us so, also telling us that Socrates said, "An unexamined life is not worth living." Socrates is reported to have said these words at the end of his trial, having been convicted by a surprisingly small majority of corrupting the youth of Athens. At this point, he was considering possible alternatives to the death penalty that had been proposed, as was his right, choosing death because, "I would rather die having spoken after my manner, than speak in your manner and live." Socrates spoke these words because he was well aware of his calling from the Divine, a consciousness that his fellow Athenians did not seem to share.

Socrates also well understood the psychology of his accusers, both democratic public opinion, which was envious of his wisdom, and the ruling authorities. Like the courtiers in the story of the Emperor's New Clothes, the latter did not like to have their pretensions of wisdom exposed to those who were delighted to hear Socrates speak. The world we live in today has little changed, an unsustainable situation. For unless we bring objective introspection into science, we cannot understand the relationship of humans to computers and will continue to live in fear and ignorance. This is not an option just for an elitist minority seeking to improve themselves, like the human potential movement, sometimes forming exclusive cliques or coteries, thinking themselves special. Rather, we need to bring everyone into the borderless, seamless fold, which is Ultimate Reality.

To this end, the Alliance will provide a nurturing gathering place for all those who recognize that we humans are inextricably entwined with each other and that, as a species, we sink or swim together. This is another aspect of the great revolution in science taking place today. Religion, science, and economics are based on the false assumption that we humans are separate from the Divine, Nature, and each other, as we have long been taught in education and business. Accordingly, this predominant culture is based on seven pillars of unwisdom, a term that Koestler introduced in *The Ghost in the Machine*, although he identified only four. These seven pillars are misconceptions of God, Universe, Life, humanity, money, justice, and reason.

The only viable way forward for humanity is therefore to rebuild the entire world of learning on the seven pillars of wisdom, recognizing that we are all One. However, while this is very easy to say, as many do today, it is not easy to put this fundamental principle of human existence into practice within an economic system that requires us to fight and compete with each other for a life-sustaining portion of the finite money supply.

Hence the Alliance. We need to support each other to become free of the existential fear that arises from attachment to ever-changing forms or structures, including our bodies, civilizations, and species, detached from Reality. As mystics through the ages have taught, this awakening experience happens when we live in union with the Divine—as the Immortal Ground of Being—free of the sense of a separate self. The Alliance is therefore not associated with any particular cultures or subcultures in the world today; it is transcultural and transdisciplinary.

By understanding ourselves, the Alliance will act as a network of networking networks, seeking to synergistically unify and integrate four global movements emerging in the world today: Spiritual Renaissance, Scientific Revolution, Sharing Economy, and World Peace. To this end, we need to cocreate a nourishing space where it is safe to question all the cultural assumptions and beliefs of our parents, teachers, and other authorities in our lives, even though these give so many a precarious sense of security and identity in life. For it is only by such questioning that we can realize that our True Nature, Authentic Self, and Genuine Identity is Wholeness and that we all live in the same Universe, experienced when the experiencer, as a separate being, dissolves into the Bliss of Consciousness.

Now, while I don't want to scare anyone or give them false hopes, I feel that it is important not to underestimate the immensity of the challenges and the vastness of the opportunities that humanity is currently being presented with. For the prospect of machines with artificial general intelligence taking over the world is not the only threat to humanity's continuing existence. For instance, John Leslie, in *The End of the World*, and Richard A. Posner, in *Catastrophe*, have identified many such threats—from technology and science, as well as natural disasters—further explored in *Global Catastrophic Risks*, edited by Nick Bostrom and Milan M. Ćirković.

Nick Bostrom, Director of the Future of Humanity Institute at Oxford University, calls these threats 'existential risk', defined in a TEDx talk titled 'The End of Humanity' in 2013, as "One that threatens the premature extinction of Earth-originating intelligent life or the permanent and drastic destruction of its potential for desirable future development".

So how are we to assuage the existential fears that arise from such existential risks? Well, what clearly will not work is to ignore them with what we can call the 'Ostrich syndrome', burying our heads in the sand. Neither can we stop the pace of evolutionary change from accelerating ever faster, a conservative approach we can call the 'Canute syndrome', attempting to stop the tide coming in.

For myself, the way that I have learnt to deal with such fears is to use the Hidden Harmony to ride the rapids of evolutionary change while resting in Stillness at the Divine Origin of the Universe. This has been possible because in us humans, evolution is "becoming conscious of itself, able to understand something of its past history and its possible future", as Julian Huxley wrote in 1957 in a visionary essay titled 'Transhumanism', transcending the cultural limitations imposed on our learning today.

What this means is that evolution is presently passing through a discontinuity in time, in what Jean Houston calls 'Jump Time', "the most radical deconstruction and reconstruction the world has seen," a "historical, epochal change … unlike any our species has lived through in the past," as John L. Petersen, founder of the Arlington Institute puts it.

It is this evolutionary discontinuity that is leading to the greatest revolution in human learning since our forebears began to pick up pieces of stone to make cutting tools with pieces of flint. For the computer is a machine quite unlike any other that the *Homo* genus has invented during the past two thousand millennia. Unlike the flint axe, wheel, printing press, telescope, steam engine, and telephone, for instance, which extend our rather limited physical abilities, *the computer is a tool of thought, able to extend the human mind, even in some cases replacing it*.

By learning to understand what we have invented by looking inwards to discover what it truly means to be a human being, we realize that all beings in the Cosmos are interconnected, in what the systems philosopher Ervin Laszlo aptly calls the 'Cosmic Internet', grounded in and embraced by *Akasha*, corresponding to the *Æther* in Greco-Roman cosmologies. We are thus destined to bring about a revolution in science that is far more radical than those introduced by Isaac Newton, Charles Darwin, and Albert Einstein combined.

Nevertheless, the current scientific revolution bears some similarities to the first. First, both revolutions can be described as a transformation from a geocentric, anthropocentric worldview to a heliocentric, deocentric perspective, *deocentric* literally meaning 'light-centred', from PIE base **dyeu-* 'to shine'. Secondly, both revolutions came and are coming about by standing outside ourselves, beyond

thinking outside the box in modern business parlance. Thirdly, the transition between the two worldviews took and is taking many years, with some seeking a compromise between the two. Fourthly, from a social perspective, there was and still is a war going on between the Aristotelians and those attempting to develop a coherent body of knowledge that corresponds to all our experiences.

In terms of the transformation of worldviews, in order to show that the planets 'circle' the Sun in ellipses, with the Sun at one focal point, Johannes Kepler, a devout Christian, visualized the power of God within the Sun, rather than at the centre of a circle, some distance from the Sun, as Ptolemy and Copernicus had done, complete with a complex system of epicycles. Kepler, the great hero of the first scientific revolution, thus came close to discovering the universal law of gravitation, over half a century before Newton did.

We can see other evidence of Kepler's ability to stand outside himself from the way he determined the orbit of the Earth around the Sun. For if the Earth is no different from the other planets, it should behave in exactly the same way as all the others, an issue that is not relevant in a geocentric planetary worldview. To calculate the orbit of the Earth around the Sun, Kepler imagined that he was standing on Mars, observing the Earth, a thought experiment that Albert Einstein said was 'true genius'.

Sadly, the English translation of Kepler's brilliant *New Astronomy*, the book that laid down the foundations of modern astronomy, which Galileo Galilei refused to read, is now out of print, perhaps because of the thoroughgoing autobiographical way that Kepler narrated the story of his discoveries. As he said in the introduction, "in telling of Christopher Columbus, Magellan, and of the Portuguese, we do not simply ignore the errors by which the first opened up America, the second, the China Sea, and the last, the coast of Africa; rather, we would not wish them omitted, which would indeed be to deprive ourselves of an enormous pleasure in reading."

I have followed a similar approach in this book, although to fully understand all the dead-end paths that I have explored in a lifetime of unlearning and learning, people would need to read my entire opus written since I began my writing career in IBM in the late 1970s, when developing an innovative marketing programme for Decision Support Systems. In my case, I don't wish to go into too much distracting detail. However, if we are not open and honest about our inner experiences, free of pretence, we cannot support each other as evolution becomes increasingly conscious of itself within us.

Like the Keplerian revolution, today's revolution in science is based on a heliocentric, deocentric, mystical *Weltanschauung*, recognizing that the Coherent Light of Consciousness, radiating from the Divine Origin of the Cosmos, is all there is. So there is a primary-secondary relationship between the Numinosphere, the Sphere of Consciousness that embraces and lies within the other three spheres described in this book, and the hylosphere, the sphere of matter, space, and time.

To illustrate the transitional nature of the two revolutions, Tycho Brahe developed a speculative compromise between the geocentric and heliocentric models of the solar system in which the inner planets circle the Sun, with the Sun and outer planets circling the Earth. In *Global Mind Change*, Willis Harman, then President of the Institute of Noetic Sciences, describes a similar compromise, at a halfway point between the traditional scientific and mystical worldviews. This ambivalence is continuing in science today, where some physicists have recognized that the unexplained phenomena of astrophysics and particle physics can only be understood by recognizing that Consciousness is all there is, as Ramesh S. Balsekar, a former President of the Bank of India and Advaita sage, aptly put it in *Consciousness Speaks*.

Of course, there is much resistance to healing the split between mysticism and science because cognitive structures possess the property of autosoteria 'self-preservation' and homeostasis 'same state',

just like the immune response of the body and any other system in the Cosmos. To break through these defensive constraints, awakening to Total Freedom, evolution needs to become fully conscious of itself, which Barbara Marx Hubbard calls the 'Second Great Event' in the history of the universe, the first being the most recent big bang.

In terms of more recent events, we are collectively engaged in freeing Western thought from Aristotelianism, a liberating process that Johannes Kepler and Francis Bacon began with the publication of *Astronomia Nova* in 1609 and *Novum Organum* in 1620, respectively. The latter was Part II of *Instauratio Magna*, the uncompleted '*Great Renewal*', which we need to complete today. And when we are finished, Western philosophy will no longer be "a series of footnotes to Plato", as Alfred North Whitehead famously put it. For we shall then recognize that universals are not eternal Forms or Ideas. Rather, the abstract concepts on which the Internet is based are formed just like any other constructs in the relativistic world of form.

Mathematically, while Einstein challenged "the noble building of Euclid's geometry" in *Relativity*, Euclid's axiomatic method of mathematical proof still holds sway, even after Kurt Gödel proved in 1931 that it is not possible to prove the axioms of mathematics to be consistent. He was unable to eliminate paradoxes and self-contradictions from mathematics, a task that Bertrand Russell and Whitehead had futilely spent twenty years on in writing their indigestible *Principia Mathematica*. Rather, Gödel showed that the notion of truth in mathematics is more fundamental than that of proof.

Here, we need to see mathematics as the science of patterns and relationships rather than the science of space and number, as the Greeks from Pythagoras onwards had conceived of mathematics. The seminal paper in this respect was George Boole's 'On a General Method in Analysis', published in 1844, leading to the invention of the stored-program computer a century later.

Nevertheless, we can still see an evolutionary process in this Great Revolution. To counteract the constant bifurcation of evolutionary processes, during the past four hundred years, scientists have made a short series of discoveries, each of which has served to unify pairs of opposites, in conformity with the Hidden Harmony. Johannes Kepler set the ball rolling in 1609 by unifying the split between causal physics and mathematical astronomy, which Aristotle had opened up in *Physics*. Isaac Newton produced the second term in this series in 1687 by unifying Kepler's celestial physics with Galileo Galilei's terrestrial dynamics in *Principia*.

Albert Einstein introduced the next two terms in this series with the special and general theories of relativity. First, in 1905, he developed the special theory of relativity by reconciling the incompatibilities between the principle of relativity, which states that physical phenomena run their course relative to different coordinate systems according to the same general laws, and the observed constancy of the speed of light. Einstein did this by replacing Newton's absolute framework of space with a relativistic space-time continuum, in which the notion of simultaneity is relativistic. In the general theory of relativity, published in 1915, Einstein went on to show the equivalence of gravitational and inertial mass during acceleration, and in so doing abandoned the Euclidean–Cartesian rectilinear model of space, replacing it with the view that space-time is curved.

In 1980, David Bohm continued this unifying process by showing how we can unify the incompatibilities between quantum physics and relativity theory in *Wholeness and the Implicate Order*. For the theories of relativity and quantum mechanics, which Bohm said should really be called 'quantum *non*-mechanics', display opposite characteristics, the former having the properties of continuity, causality, and locality, with the latter being characterized by noncontinuity, noncausality, and nonlocality.

This book introduces the sixth and final term in this series, describing how *all* opposites can be unified in Wholeness. In so doing, it changes the meaning of *cosmos*, as the physical universe, to *Cosmos*, as Consciousness, embracing and lying within the entire Universe, as we can discover by mapping inner space, as the Cosmic Psyche, rather than outer space.

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Now, this radical transformation of culture and consciousness might seem a little overwhelming at first sight. But if we keep faith with our own inner energies, trusting that Life is carrying us all to our ultimate destiny as a species, we could have a lot of fun. The central issue here is that the challenges that we face as a species are not scientific, technological, ecological, economic, political, or religious, for psychology underlies all these branches of human endeavour.

This means that the situation that humanity faces today is incredibly sensitive. It is important to note here that none of us can actually teach anything to any other, for ultimately what we learn as unique human beings arises through the creative power of Life, bubbling up directly from the Divine Origin of the Universe, like a fountain. All we can do as a community of souls is to help each other to disperse the clouds of unknowing that inhibit the Coherent Light of Consciousness from radiating brilliantly through us, using a term from an anonymous fourteenth-century English mystic.

Not that this is easy for we use these clouds to protect our vulnerabilities, defending our precarious senses of security and identity in life, acting as if we were separate from each other and the Divine, even when we know that we are not. This is the principal reason why scientific revolutions have taken decades, centuries, and millennia to come about in the past.

For we need to follow Einstein's advice from 1946: "a new type of thinking is essential if mankind is to survive and move to higher levels. … Past thinking and methods did not prevent world wars. Future thinking *must* prevent wars." And such changes in thinking can take quite a long time, as Max Planck sadly remarked in his *Scientific Autobiography*: "a new scientific truth does not triumph by convincing its opponents and making them see the light, but rather because its opponents eventually die, and a new generation grows up that is familiar with it."

However, humanity does not have such luxury today; time is not on our side. Not knowing what is causing the pace of change in society to accelerate exponentially, we are managing our business affairs blindfold, at best partially sighted, rather like driving along the highway with our eyes closed. Within just a few years there is going to be the most almighty pile-up, to put it bluntly.

This evolutionary inevitability will serve as the life-shock that humanity needs to wake up to what is happening to our species at the present time. But if we wait until the global economy self-destructs it will be too late. With little understanding of what has caused this to happen, the techniques of crisis management that businesses have been applying over the years, because they have not seen the inevitable or expected the unexpected will no longer work.

However, there is an alternative way of stimulating the life-shock that is needed to bring humanity back to its senses. Publishing the solution to the ultimate problem in human learning could have just such an effect. Not everybody will understand the solution immediately, for it takes many years of self-inquiry to fully understand. However, just the existence of such a solution could be such a relief to people who know that they are not being taught the truth that it would lead to a wonderful explosion of creative synergistic energy, the like of which has never been seen before. The rapid changes that are happening today within the pioneering evolutionary movement would seem like the proverbial storm in a teacup.

By demolishing the barriers that prevent Life flowing freely within us, we could overcome the time constraints we seem to face today. For if we do not complete the revolution in science by 2020—building on what Stephen Dinan, CEO of the Shift Network, calls Vision 2020—it is most unlikely that my neighbours' one-year-old daughters will have happy and fulfilling lives, with children and grandchildren of their own, able to survive until their eighty-fifth birthdays at the end of the century.

The fifty most influential people in the world today identified by Business Insider—such as politicians, financiers, technologists, religious leaders, and entertainers, but no scientists—might not be ready to join the Alliance for Mystical Pragmatics immediately, for they function for the most part with dysfunctional, conflict-ridden value systems, operating within an unsustainable worldview. But if we cannot soon involve Nobel prize winners, Fellows of the Royal Society of London for Improving Natural Knowledge, and the CEOs of Alphabet, Facebook, Apple, Oracle, Microsoft, and IBM, we shall not be able to deal practically with what Bank of America Merrill Lynch calls 'Creative Disruption' in a report published in November 2015, as robots take over more and more jobs currently being performed by humans.

The invention of the stored-program computer in the late 1940s requires us to make the most fundamental change in the work ethic that has prevailed since humans stopped being hunter-gatherers and began to settle in villages to cultivate the land and domesticate animals some 10,000 years ago. Such a radical change in the way that we spend our days will require quite different information systems from those that run the business world today. For we urgently need to build post-capitalist, post-communist systems for the Sharing Economy, supporting the radical change in work ethic we need for our health, well-being, and long-term survival. And we have just five to fifteen years in which to make these epochal changes.

That, in essence, is why I have written this book in the way that I have. It is not very poetic, a style that mystics have traditionally written in. Yet, I still feel that poetry underlies my writings, in the sense of the inherent *sapienza poetica* 'poetic wisdom' that all humans possess, as Giambattista Vico described in *The New Science*, published in three Italian editions from 1725 to 1744, as a riposte to Cartesian-Newtonian mechanism. As Albert Einstein wrote in an essay on scientific method in 1936, "The whole of science is nothing more than a refinement of everyday thinking."

This insight applies just as much to the rational conceptual maps that we draw of our inner worlds as those of outer observations and experiences. To see this, scientists need to acknowledge the role of visualization in creativity. For instance, Einstein described his tentative creative processes in a letter he wrote to Jacques Hadamard in 1945, published in *The Psychology of Invention in the Mathematical Field*. Another scientist who described the origin of his thoughts was August Kekulé, who narrated in 1890 how a reverie (*Traümerei*) on a horse-drawn carriage in London had led him to develop the modern structural theory of organic chemistry.

If we are to intelligently manage our business affairs with full consciousness of what we are doing, it is absolutely imperative that we include such experiences in the territory that is being mapped rationally and scientifically. There is nothing that could be a source of pride or embarrassment in such self-reflection, as Vimala Thakar pointed out in *Spirituality and Social Action*. As she said, "the inner life or the psychological life is not a private or a personal thing, it's very much a social issue." So if we do not look inwards to discover why we behave as we do, we are actually being antisocial, disturbing the peace and harmony of our beautiful planet Earth.

Vimala Thakar began her book with these inspiring words, "In a time when the survival of the human race is in question, continuing with the status quo is to cooperate with insanity, to contribute to chaos."

She therefore asks, "Do we have the vitality to go beyond narrow, one-sided views of human life and to open ourselves to totality, wholeness?" For as she says, "The call of the hour is to move beyond the fragmentary, to awaken to total revolution.

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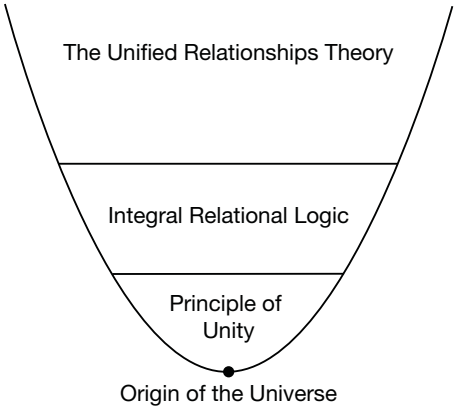
For myself, the great challenge I have been facing for many years is how best to present my life's work. The situation I face today is very similar to that which Charles Sanders Peirce faced in 1885, when he felt that he may have "found the key to the secret of the universe", writing to his lifelong friend William James, "I have something very vast now. I shall write it for Mind. They will say that it is too vast for them. It is … an attempt to explain the laws of nature, to show their general characteristics and to trace them to their origin & predict new laws by the laws of the laws of nature."

Nevertheless, two years later, Peirce set out to write a book titled *A Guess at the Riddle*, the first chapter being called 'One, Two, Three: Fundamental Categories of Thought and Nature', the foundation of his triadic architectonic. As already mentioned, this led Ted Codd to develop the relational model of data, which has led me to use Peirce's guess at the riddle, which I call the Principle of Unity, to develop Integral Relational Logic (IRL), the commonsensical art and science of thought and consciousness that we all implicitly use everyday to form concepts and organize our ideas. In turn, Integral Relational Logic provides the Cosmic Context, coordinating framework, and Gnostic Foundation for the Theory of Everything, called the Unified Relationships Theory (URT) or Panosophy, the complete integration of science, philosophy, and religion and of all sciences and humanities.

In Peirce's case, he wrote an introduction to *A Guess at the Riddle*, beginning with these words: "To erect a philosophical edifice that shall outlast the vicissitudes of time, my care must be, not so much to set each brick with nicest accuracy, as to lay the foundations deep and massive," the very first sentence of the first volume of his *Collected Papers*, published in 1931. He then went on to write in the same paragraph:

> The undertaking which this volume inaugurates is to make a philosophy like that of Aristotle, that is to say, to outline a theory so comprehensive that, for a long time to come, the entire work of human reason, in philosophy of every school and kind, in mathematics, in psychology, in physical sciences, in history, in sociology, and in whatever department there may be, shall appear as the filling up of its details. The first step toward this is to find simple concepts applicable to every subject.

In the event, although Peirce did not finish this book, we can see the direction of his thoughts from five metaphysical essays he wrote from 1891 to 1893 for the *Monist*, edited by Paul Carus, who was the compiler of *The Gospel of Buddha: Compiled from Ancient Records*, the classic text on Buddhism that first introduced many Westerners to the Buddha and his teachings. In later life, Peirce made two or three other attempts to write his magnum opus, but, as an outcast from both society and academia, never managed to complete his ambitious project.



For myself, I use this diagram to show that the Principle of Unity or Hidden Harmony is not based on any other idea in the history of human learning. It emerges directly from the Origin of the Universe, as mystics throughout the history of ideas have discovered.

To explain what I mean by this, I've written a hierarchically ordered series of short pages on the website for the Alliance for Mystical Pragmatics under the rubric 'Cognitive Framework', containing a succinct overview of the unification of mysticism and science. This is divided into four sections titled 'Cosmology of

cosmologies', 'Mapping the Cosmos', 'Our evolutionary story', and 'Healing our society'.

The website also contains a trilogy of essays addressing the three main constituents of the Alliance, which are prerequisites for World Peace. These are titled, 'Recapitulating the Cosmogonic Cycle: Understanding Ourselves', 'Integral Relational Logic: The Art and Science of Consciousness', and 'The Sharing Economy: Transcending the Divisiveness of Money'.

In 2015, I wrote another trilogy of reasonably short essays, titled 'The Cosmic Equation: Unifying All Opposites', 'The Evolution of Universals: Being a Universal Human', and 'Revealing the Hidden Harmony: The Heart of Transformative Harmony'. The first two were inspired by biopics of Stephen Hawking and Alan Turing, which won Oscars in 2015. The third was written for Ananta Kumar Giri, Vice-President of the Global Harmony Association and Professor of Sociology at the Madras Institute of Development Studies for a book of essays he is editing on *Transformative Harmony*.

In 2012 and 2014, I also wrote a couple of treatises titled 'The Principle of Unity: Living Intelligently and Peacefully at the End of Time' and 'The Theory of Everything: Unifying Polarizing Opposites in Nondual Wholeness'. These were written for former and then current Presidents of the Royal Society, but I did not get any reply to my overtures. You are welcome to download all these articles from the Alliance's website at http://mysticalpragmatics.net/articles.

I have long had the intention of merging all these writings into a 1,500-page trilogy titled *Wholeness: The Union of All Opposites*, with the three parts titled *Integral Relational Logic*, *The Unified Relationships Theory*, and *Our Evolutionary Story*. This is alternatively titled *Semantic Principles of Natural Philosophy* to indicate that it is intended to complete the final revolution in science, just as Newton's *Mathematical Principles of Natural Philosophy* completed the first. *Wholeness* is available at http://mysticalpragmatics.net/books-wholeness. However, given the urgency of the crisis facing humanity today, I'm uncertain whether such a tome is relevant any longer. It is more important to live the Truth than write about it.

Accordingly, this book on *The Four Spheres* you are reading lies at an intermediate point between these extremes. It is the deepest and broadest piece I have ever written, penetrating the depths of mystical experience while addressing a multitude of specialist disciplines concerned with studying the Four Spheres that constitute the Cosmos in this model. It outlines the spiritual and rational worldview that provides the Cosmic Foundation and coordinating framework for the Alliance for Mystical Pragmatics in as nontechnical terms as possible, mostly eschewing mathematics for this often hides rather than reveals meaning and understanding.

This might seem strange for a scientific treatise. But there is very little need to quantify our observations and theories, another key aspect of the revolution in science taking place today. For instance, in business, it is said, "If you cannot measure, you cannot manage," probably inspired by William Thomson's view of physical science, "To measure is to know," and "When you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot measure it, when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind." Yet information systems architects use both qualitative and quantitative domains of values in their models with equal facility.

The only quantitative mathematics that we need to understand what is happening to us all at the present time is arithmetic and its operators, expressed in simple algebraic formulae. Of course, as evolution is accelerating exponentially, it is necessary to mention the exponential function e^x and its discrete simpler form a^n, which underlie functions that model population growth and the rise and fall of

natural resources, such as peak oil. But it is not necessary to understand the mathematics to see the S-shape and bell shape of the curves that the mathematics represents.

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In the case of this book, it is more autobiographical than some of my other writings, describing not only ideas but also what was happening to me at the time these ideas emerged in consciousness. After the Introduction, this evolutionary process is outlined chronologically in Chapter 2 on 'An Ontogenetic Perspective', with further details mentioned at appropriate points in the rest of the exposition. This provides a succinct description of the cosmology of cosmologies that arises when healing the split between mysticism and science. By transcending the categories and unifying all opposites, it shows that we all live in the same Universe, sharing the same Divine Presence, no matter what our cultural conditioning or fragmented mental maps might tell us.

From this Holoramic starting point, Chapters 3 to 6 on 'The Numinosphere', 'The Noosphere', 'The Biosphere', and 'The Hylosphere' describe how we can view the Universe in four spheres of diminishing significance: mystical, mental, biological, and physical, a contextual inversion of the materialistic, mechanistic way of viewing these four realms. Not surprisingly, the world looks utterly different in this integral, holistic perspective from that which runs our business lives today and that which we teach our children in schools and universities.

However, these chapters provide only an overview of Integral Relational Logic. For if I went into too much detail in this composition, it would become unbalanced. All that need be said here is that this coherent system of thought answers the call that Erich Fromm made in 1976 in *To Have or To Be?* for "a Humanistic Science of Man as the basis for the Applied Science and Art of Social Reconstruction".

IRL is also the science of consciousness that the Center for Consciousness Studies at Tucson, Arizona has been searching for since 1994, holding a biennial series of conferences titled 'Toward a Science of Consciousness'. Interestingly, the conference scheduled for 25-30 April 2016 is simply titled 'The Science of Consciousness', presumably because the organizers believe that they have discovered this elusive science.

In the context of Panosophy or the Unified Relationships Theory, the Hidden Harmony becomes the Cosmic Equation, a theorem in mathematical logic that cannot be proven to be true from any set of axioms, for it is the most basic of all ideas, generating all others. The Cosmic Equation is thus the simple, elegant equation that can explain everything—which Albert Einstein and Stephen Hawking long searched for, but never found.

After seeing how the Four Spheres relate to each other in the Panosophical Cosmology, Chapters 7 and 8 on 'The Singularity in Time' and 'Entering the Age of Light' explore what could happen to humanity as evolution passes through its much-feared apocalyptic discontinuity at the end of time in the collective. For those who have yet to pass through this cultural death and rebirth process, it could seem terrifying and incredibly exciting at the same time.

To get through these turbulent times as equanimously as possible, the general populace will need to understand our evolutionary story, from Alpha to Omega and back again, presented in the simplest and clearest possible terms. To this end, in 2006 I drafted a synopsis for a thirteen-part television series titled 'Our Evolutionary Story'. This was inspired by David Attenborough's *Life on Earth*, which triggered my interest in the exponential rate of evolutionary change that we technologists were and still are driving. For in the opening episode of the series, Attenborough gave a simple metaphor to show how evolution has been accelerating faster and faster during the past three and a half billion years.

To express this phenomenon in mathematical terms, in 2011, I wrote an essay titled 'The Singularity in Time: The Omega Point of Evolutionary Convergence', which now needs to be updated with my latest discoveries. I wrote this essay in preparation for a poster presentation I gave at the Science and Nonduality (SAND) conference in California on 'The Two Dimensions of Time', presenting the entire cosmology of cosmologies on one sheet of paper measuring 8′ × 4′, about three square metres.

This is another aspect of today's Great Scientific Revolution. If we are to live our lives in harmony with the fundamental laws of the Universe, free of the existential fear of death, we need to live more in the Eternal Now, the vertical dimension of time, than in the horizontal dimension of past and future, which is illusory.

Finally, Chapter 9 'Alliance for Mystical Pragmatics' outlines what we could all do together to generate the synergistic energy we need to get through the momentous evolutionary changes happening at the moment relatively unscathed. The title of the Alliance has been inspired by workshops that Ananta Kumar Giri has been holding on Spiritual Pragmatism and Spiritual Pragmatics since February 2011. To describe what this means, I wrote an essay for him titled 'Mystical Pragmatics: Harmonizing Evolutionary Convergence', published by the Indus Business Academy in *3D: IBA Journal of Development* in its January–June 2014 edition on the theme 'Spiritual Pragmatism and Spiritual Pragmatics'.

But given the immense resistance in society to making the changes that we urgently need to make to adapt to our rapidly changing environment, caused by our own inner creative energies, we need to be utterly aware of the great psychological crisis humanity is in today. To this end, Ananta's notion of 'Transformative Harmony' is of central importance, involving both compassion and confrontation. As he says in an introductory essay on this marvellous vision, "Compassionate confrontation is an epochal evolutionary challenge now."

Our children and grandchildren, especially, will need to invoke compassionate confrontation as well as Mohandas Gandhi's *Satyagraha* 'Truth force', as evolution pushes and pulls us all far beyond the comfort zones that apparently provide us with safe havens in today's turbulent world. For while some people are lucky enough to enter Heaven on Earth without a struggle, most need to pass through many dark nights of the soul, in the words of John of the Cross. As Western civilization disintegrates at ever-increasing speeds, there are no secure, invulnerable niches in which to hide. We are all in this great adventure together.

Because of the invention of the stored-program computer in the late 1940s, during the next five to fifteen years, human societies will need to make greater changes in their value, education, and business systems than all those in the past five thousand. May Love, Life, and Light be with us all as we synergistically cocreate networks of peaceful, collaborative communities, guided by the Hidden Harmony.

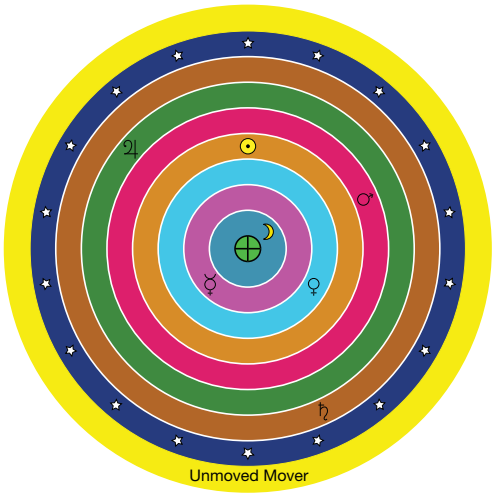
1. Introduction

The Four Spheres provide a way of viewing and experiencing God and the Universe that heals the split between mysticism and science, as they have been understood in the East and the West through the ages. Although these spheres have been given many names over the years, especially the outermost one, we can simply designate them as **Numinosphere**, from Latin *nūmen* 'divinity', **noosphere**, from Greek *noos* 'mind', **biosphere**, from Greek *bios* 'life', and **hylosphere**, from Greek *ὑlē* 'matter', the last three nested into the preceding one in this list.

The Great Chain of Being

Although this way of viewing the Cosmos as an ordered whole is radically different from the way scientists teach us to view the Universe today, the idea that the Totality of Existence can be viewed as a group of spheres each contained within the next like Russian dolls is not new. In the William James Lectures in 1933, Arthur O. Lovejoy called this timeless worldview the Great Chain of Being, "composed of an infinite number of links ranging in hierarchical order from the meagerest kind of existents … through 'every possible' grade up to the *ens perfectissimum*".[1]

As an example of this cosmic model, the ancient Greeks saw the heavens as a nested set of crystalline spheres, centred on the Earth. In this mental map of the universe, the Sun, Moon, and planets, as 'wandering stars', move within the space between the inner and outer walls of these spheres, but nothing could move through them. An eighth sphere is fixed and immutable, aptly named the firmament of stars, with the Unmoved Mover outside them. The only things that could change and move in the heavens were the Moon, Sun, and five known planets in their seven celestial spheres.[2] It was thus believed that all other change, all generation and decay, were confined to the immediate vicinity of the Earth, the sublunary sphere.[3]



The region above the Earth was called *šāmayim* and *ouranos* in Hebrew and Greek, translated as 'heaven' in the Bible, with an uncertain etymology, perhaps indicating humanity's millennia-long confusion about the relationship of God and the Universe. In the Bible, *heaven* often denotes 'invisible realm of God'. *Heaven* is also a euphemism for *God*, the phrase *heaven and earth* combining into one meaning 'the universe', the totality of everything that exists.[4] Figuratively, from the 1300s, *heaven* came to mean 'place of supreme bliss', as far removed from humanity as possible, with only mystics seeking

'Heaven on Earth', healing the split between humans and the Divine, corresponding to Latin *in caelo esse* 'to be in seventh heaven'.

The concept of sphere derives from Latin *sphæra*, from Greek *sphaira* 'ball, globe', words often used in an astronomical sense. We can see this most clearly in Aristotle and Ptolemy's geocentric cosmology, still holding sway in the Middle Ages. The word *sphere* appeared in English about 1300 with this astronomical sense, defined by the *Oxford English Dictionary* (OED) as "The apparent outward limit of space, conceived as a hollow globe enclosing (and at all points equidistant from) the earth; the visible vault of heaven, in which the celestial bodies appear to have their place."

This Western view of the Cosmos began to change when Copernicus reluctantly published his earth-shattering book *The Revolutions of the Heavenly Spheres* on his deathbed in 1543, which Arthur Koestler called an 'all-time worst seller' because of its unreadability. Kepler's *New Astronomy*, the book that laid down the foundations of modern astronomy in 1609, did not fare much better. Galileo, arrogantly thinking that he was the foremost astronomer in the world, refused to read Kepler's pivotal book and therefore never discovered that the planets circle the Sun in ellipses, with the Sun at one of the focal points.[5]

Geocentric spheres

Even though Copernicus, Kepler, Galileo, and Newton knocked humanity off the pedestal on which our forebears had placed themselves, the notion that the Earth plays a central role in our lives has long persisted. In 1677, the English naturalist Robert Plot envisaged an *atmosphere* encompassing the Earth, from Greek *atmos* 'vapour', a notion that was later extended to the air surrounding the planet. The figurative sense of 'surrounding influence' appeared between 1797 and 1803.[6]

Now, as the Earth is very nearly a sphere, in the 1870s, geologists and geographers envisaged that the surface of the planet, itself, consists of two spheres, the *lithosphere* and *hydrosphere*, from Greek *lithos* 'stone' and Greek *ὐdōr* 'water', respectively. These neologisms led H. J. Kinder to write in the *Times* of London in 1877 that a descriptive analysis of the Earth's surface includes "the atmosphere, the hydrosphere, the form of the lithosphere and the material of its surface".[7]

The Austrian geologist Eduard Suess added *biosphere* to this list in 1875 in *Die Entstehung Der Alpen*, a book apparently not translated into English as *The Origin of the Alps*. However, he did not give a clear definition of the concept, merely saying that the biosphere is a region of interaction between the upper sphere and the lithosphere.[8] The word *biosphere* first appeared in English in 1899, when the Scottish geographer Hugh Robert Mill wrote, "Some geographers even bring in the layer of living matter to complete four parts of the physical globe—the lithosphere, hydrosphere, atmosphere and biosphere."[9]

In the event, the word did not begin to become generally accepted until 1909, when Suess used it in the final chapter titled 'Life' in his monumental *The Face of the Earth*. He was inspired by an 1869 book by Carl Rokitaneky, a Viennese pathological anatomist, who saw all life as a single manifestation, speaking "not of unity, or of common origin, but of the *solidarity* of all life". This vision of the indivisibility of life led Suess to the idea of a biosphere, "which assigns to life a place above the lithosphere".[10]

The Russian mineralogist and geochemist Vladimir Vernadsky popularized the idea of the biosphere in 1925 with the publication of *The Biosphere*, today considered the seminal work in the science of the biosphere. For, as Vernadsky recognized, "virtually all geological features at Earth's surface are bio-influenced."[11] Yet, even then the idea was slow to take off, mainly due to the isolation of Soviet scientists. It was not until 1998 that Vernadsky's book was finally published in full English translation. Even James

Lovelock was unaware of Vernadsky when he formulated his Gaia hypothesis of the living Earth in 1979.[12]

Today, *biosphere* is a familiar term, denoting the global sum of all ecosystems.[13] In the early 1930s, the British botanist Arthur Roy Clapham suggested the term *ecosystem* to the English botanist Arthur Tansley,[14] the first president of the British Ecological Society and founding editor of its *Journal of Ecology*. Tansley explained the meaning of the word in a seminal paper in that journal in 1935, when he wrote, "These ecosystems … form one category of the multitudinous physical systems of the universe, which range from the universe as a whole down to the atom." He used the term to refer not only to "the whole complex of organisms inhabiting a given region", but also to "the whole system (in the sense of physics), including not only the organism-complex, but also the whole complex of physical factors forming [its] environment". As he said, "there is constant interchange of the most various kinds within each system, not only between the organisms but between the organic and the inorganic."[15]

Such developments in the Earth sciences led the Jesuit mystic, geologist, and palaeontologist Pierre Teilhard de Chardin to realize that there is another sphere beyond the biosphere enveloping the planet—a human sphere. In *The Spirit of Fire: The Life and Vision of Teilhard de Chardin*, Ursula King reminds us that Teilhard regarded the human being as the key to the understanding of evolution, beyond the evolution of the species. Inspired by Suess, Teilhard visualized a thinking layer, a sphere of mind and spirit, surrounding the globe, which he initially called the *anthroposphere*,[16] but then changed this to *noosphere* in 1925, in an essay titled 'Hominization: Introduction to a Scientific Study of the Human Phenomenon'.

As he said, "And this amounts to imagining, in one way or another, above the animal biosphere a human sphere, a sphere of reflection, of conscious invention, of conscious souls (the Noosphere, if you will)."[17] To Teilhard, hominization was a biological process, which he also called anthropogenesis, which marked the passage from non-reflective animal life to reflective human life, leading to noogenesis, the third stage of evolution.[18]

However, it is unclear who actually coined this vitally important word. Teilhard, himself, thought that he had done so, as his biographer Claude Cuénot tells us.[19] On the other hand, Lynn Margulis and Dorion Sagan suggest that *noosphere* was coined by Édouard Le Roy, the successor to Henri Bergson at the Collège de France.[20] Teilhard and Le Roy were close associates from 1921 to 1934, when their interests diverged,[21] perhaps because they saw the relationship between the noosphere and biosphere in different ways.

This was certainly the case with Vernadsky, who, along with Le Roy, helped to make the term better known before Teilhard's works were published posthumously over thirty years later.[22] But Vernadsky used *noosphere* in a quite different way from Teilhard. As Lynn Margulis tells us, "For Teilhard the noosphere was the 'human' planetary layer forming 'outside and above the biosphere', while for Vernadsky the noosphere referred to humanity and technology as an integral part of the planetary biosphere."[23]

This is a view that still prevails in scientific circles, typically not able to take the next step that Teilhard took. For he did not stop with the noosphere. In 1952, in a letter to Jeanne Mortier, his secretary and appointed literary executrix, he wrote, "The next thing I shall write 'for myself' … will perhaps be a study on the 'Christosphere' … that more or less brings me back to 'The Divine Milieu'."[24] The work that Teilhard referred to here was 'The Christic', which he wrote in the month before he died in 1955. 'The Christic' was a development of *Le Milieu Divin: An Essay on the Interior Life*, written in China during Teilhard's darkest hour in 1927. 'The Christic' and 'The Heart of Matter', a spiritual autobiography

written in 1950, then tell us how science and religion had converged within him.[25]

So "Heaven does not stand in opposition to earth," as Teilhard wrote in 'The Road of the West: To a New Mysticism'. His notion of the all-embracing Ultimate Sphere brings us back to Aristotle's Unmoved Mover, expressed in *Metaphysics* in this way: "Now since that which is moved must be moved by something, that the prime mover must be essentially immovable, and eternal motion must be excited by something eternal."[26] In *Summa Theologiæ*, Thomas Aquinas then took Aristotle's cause-and-effect chain as the basis for his five proofs for the existence of God, as the Unmoved Mover.[27]

Le Milieu Divin

As a species, civilization, and culture, we thus face something of a dilemma. Teilhard's brilliant synthesis and any evolutionary developments of this comprehensive evolutionary model are not generally acceptable to either religionists or scientists. For as Ken Wilber writes in *The Marriage of Sense and Soul: Integrating Science and Religion*, "Truth and meaning, science and religion; but we still cannot figure out how to get the two of them together in a fashion that *both* find acceptable."[28]

Another who doesn't believe that it is possible to find Peace by unifying Western science and Eastern mysticism is Fritjof Capra, the author of the influential book *The Tao of Physics: An Exploration of the Parallels between Modern Physics and Eastern Mysticism*. He writes:

> Once these parallels between Western science and Eastern mysticism are accepted, a number of questions will arise concerning their implications. Is modern science, with all its sophisticated machinery, merely rediscovering ancient wisdom, known to the Eastern sages for thousands of years? Should physicists, therefore, abandon the scientific method and begin to meditate? Or can there be a mutual influence between science and mysticism; perhaps even a synthesis?[29]

He goes on to say:

> I think all these questions have to be answered in the negative. I see science and mysticism as two complementary manifestations of the human mind; of its rational and intuitive faculties. The modern physicist experiences the world through an extreme specialization of the rational mind; the mystic through an extreme specialization of the intuitive mind. The two approaches are entirely different and involve far more than a certain view of the physical world.[30]

The key word here is *parallels*. While there are many similarities between the paradoxes of quantum physics and mysticism, by changing the meanings of *science* and *religion* it is quite possible to bring them together in inseparable union in a manner that is counter to the postmodernist zeitgeist of academia today.

In Teilhard's case, his Jesuit superiors forbad the publication of any of his non-palaeontological and non-geological works in his lifetime. Regarding *Le Milieu Divin*, two colleagues initially gave their approval for publication, but a church official had reservations. So when the manuscript was sent to the Rome authorities, they forbade publication. A similar thing happened to *Le Phénomène Humain*. In August 1944, four years after completing his magnum opus, Teilhard learned the deeply disappointing news that ecclesiastical permission to publish had been withheld.[31] Even after Teilhard's death, the Roman Catholic Church did not let up on its criticism of his work, in 1962 issuing a Communiqué of the Press Office of the Holy See under the rubric 'Warning Regarding the Writings of Father Teilhard de Chardin', saying that his works offend Catholic doctrine and

> For this reason, the most eminent and most revered Fathers of the Holy Office exhort all Ordinaries as well as the superiors of Religious institutes, rectors of seminaries and presidents of universities, effectively to protect the minds, particularly of the youth, against the dangers presented by the works of Fr. Teilhard de Chardin and of his followers.[32]

In scientific terms, the central problem is that the notions of the noosphere and Christosphere lie outside the domain studied by materialistic, mechanistic science, outside the so-called natural sciences. By placing artificial limits on science, Peter Medawar, the winner of the 1960 Nobel Prize in Physiology or Medicine, was perhaps Teilhard's harshest critic. In 1961, he wrote a critical review of this wonderfully all-encompassing book, saying this in the introduction:

> The greater part of it, I shall show, is nonsense, tricked out with a variety of metaphysical conceits, and its author can be excused of dishonesty only on the grounds that before deceiving others he has taken great pains to deceive himself. *The Phenomenon of Man* cannot be read without a feeling of suffocation, a gasping and flailing around for sense. There is an argument in it, to be sure—a feeble argument, abominably expressed—and this I shall expound in due course; but consider first the style, because it is the style that creates the illusion of content, and which is a cause as well as merely a symptom of Teilhard's alarming apocalyptic seizures.[33]

Nevertheless, Peter Medawar and his wife Jean later pointed out that the temporalization of the Great Chain of Being in the eighteenth century[34] culminated in the evolutionary conception, for instance expressed in Teilhard's *The Phenomenon of Man*, which they still mockingly called an 'incoherent rhapsody'.[35]

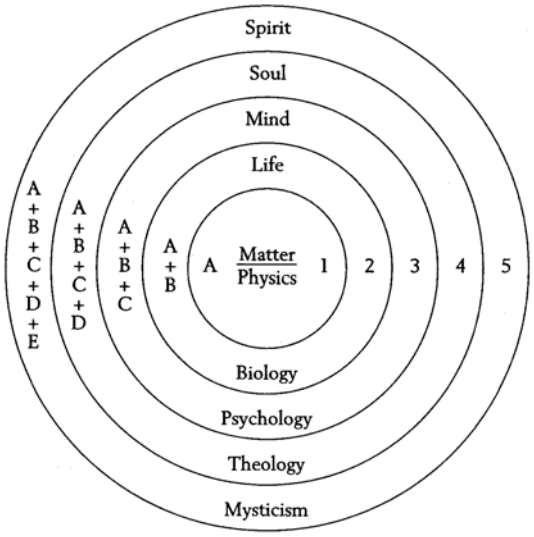
One notable exception to scientists' general disparagement of Teilhard's all-embracing synthesis was Julian Huxley, author of *Evolution: The Modern Synthesis*, much favoured by neo-Darwinists, as Huxley pointed out in the introduction to the second edition in 1963.[36] In 1959, Huxley wrote the Introduction to *The Phenomenon of Man*, the first English translation of Teilhard's magnum opus, having been a friend and correspondent of Teilhard during the last ten years of Teilhard's life. For they shared a common vision of the vastness of unrealized human potential, which could be realized through evolutionary convergence,[37] as the universe becomes increasingly consciousness of itself in humans.[38] This vision is much inspiring leading evolutionaries today,[39] although they are not as radical as the educational teaching of J. Krishnamurti[40] and A. N. Whitehead,[41] urging us to be free of our conditioning and 'inert ideas'.

For, as Huxley wrote in a visionary 1700-word essay published in 1957, by "destroying the ideas and the institutions that stand in the way of our realizing our possibilities", we could understand human nature, what it truly means to be a human being. We could thereby transcend our limitations, fulfilling our highest potential as spiritual beings, living in mystical ecstasy, free from the suffering that has plagued humanity through the millennia. Huxley called this mystical evolutionary process of humanity transcending itself 'transhumanism',[42] with a somewhat different meaning from what atheistic transhumanists seem to mean by the word today,[43] which we look at again on pages 148 and 153.

For scientists are still fighting about this critical issue among themselves, as we see in Richard Dawkins' *The God Delusion*, countered by *The Science Delusion: Freeing the Spirit of Enquiry* by Rupert Sheldrake, also the author of *A New Science of Life*, which John Maddox famously called "the best candidate for burning there has been for many years".[44] In the summer of 2015, Rupert Sheldrake engaged in a new battle with renowned sceptic Michael Shermer, who said, "Science, properly conceived, is a materialistic enterprise; for science to look beyond materialist explanations is to betray science and engage in superstition."[45] But mathematics, computer science, and the information systems modelling methods underlying the Internet are not material objects and no one says that they are based on superstition.

However, another who has seen that evolutionary processes can be seen in the context of the Great Chain of Being is E. F. Schumacher, who said, "Our task is to look at the world and see it whole", which requires us to follow the fundamental maxim of mapmaking, "Accept everything; reject nothing." From this integral, holistic perspective, he visualized four kingdoms as mineral, plant, animal, and human. As he said, in the early part of the nineteenth century, this was "probably the most widely familiar conception of the general *scheme* of things, of the constitutive pattern of the universe".[46]

But this was not to last. As Ken Wilber pointed out, in his own attempt to integrate science and religion, "With the rise of modernity in the West, the Great Chain of Being almost entirely disappeared. … In its place was a 'flatland' conception of the universe as composed basically of matter. … Thus, in the place of the Great Chain reaching from matter to God, there was matter, period."[47]



The Four Spheres

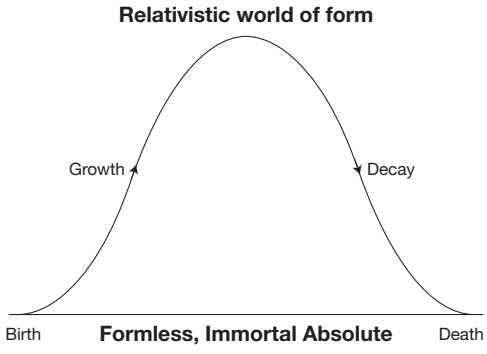
To return to the nearly universal view that "reality is a rich tapestry of interwoven levels, *reaching from matter to body to mind, to soul to spirit*", Ken pointed out that the Great Chain of Being should really be called the Great *Nest* of Being, with each senior level enveloping its junior dimensions—"a series of nests within nests within nests of Being".[48]

As this diagram of the Great Nest of Being indicates, each sphere has a specific branch of knowledge associated with it: "Physics studies matter. Biology studies vital bodies. Psychology and philosophy address the mind. Theology studies the soul and its relation to God. And mysticism studies the formless Godhead or pure Emptiness, the radical experience of Spirit beyond even God and the soul."[49]

The two dimensions of time

It might seem therefore that all I need to do to heal the deep psychic wound between mysticism and science that I have introjected from the culture I was born into is to study Ken's voluminous writings, installing his Superhuman Operating System (OS) in my psyche, as he taught in 2014 and 2015.[50] Sadly however, after over thirty years of such studies, I have come to realize that his integral philosophy, psychology, and spirituality do not satisfactorily map my own ontogeny or the phylogeny of the human race, from Alpha to Omega and back again. I am not a machine and the all-powerful Superhuman OS that we need to fully understand ourselves can only come from within, as this book describes.

Such a life's journey recapitulates what Joseph Campbell called the 'Cosmogonic Cycle', depicted in this life-and-death diagram. For all beings in the Universe are born to die, with no exceptions. This naturally includes our planet, species, and civilizations, the global economy, and our individual body-mind-soul organisms. In this instance, the base line represents the mystical and formless transfinite, out of which the entire world of form arises.

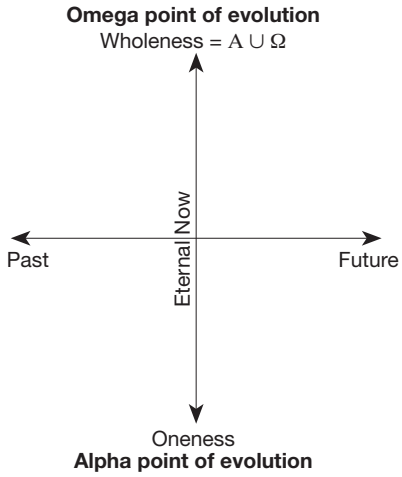


However, essentially the same curve can also be expressed in various mathematical formulae, where the base line is typically zero, the other side of the coin from infinity. An example is the peak-oil curve, which M. King Hubbert introduced in 1956, showing that the cumulative production of such finite resources as oil, gas, and coal must follow a bell-shape curve.[51] This curve and the related S-shape of the growth or learning curve is applicable in a wide variety of other situations, such as population growth, in particular, the growth of form, in general, and in the distribution curves of probability theory, which we look at later. However, I primarily use these curves as tools of thought, rather than quantitative mathematical formulae.

For the primary purpose in life is about facing death in all its forms so that we can become fully alive while still in the body. As Campbell wrote, "Redemption consists in the return to superconsciousness and therewith the dissolution of the world. This is the great theme and formula of the cosmogonic cycle, the mythical image of the world's coming to manifestation and subsequent return into the nonmanifest condition."[52] From his in-depth studies of the myths and fairy tales of multiple cultures through the ages, Campbell calls the universal spiritual journey the 'monomyth', in which "A hero ventures forth from the

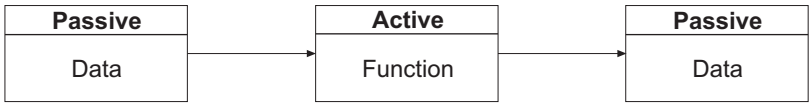
world of common day into a region of supernatural wonder: fabulous forces are there encountered and a decisive victory is won: the hero comes back from this mysterious adventure with the power to bestow boons on his fellow man."[53]

So far, so good. However, appearances can be deceptive. Viewed from the Timeless Godhead, rather than from an anthropocentric perspective, our journeys in life do not actually take place in the horizontal dimension of time, but in the vertical dimension, in the Eternal Now, depicted here. This is a notion made famous in Eckhart Tolle's best-selling *The Power of Now*. As he says,



> To be identified with your mind is to be trapped in time: the compulsion to live almost exclusively through memory and anticipation. This creates an endless preoccupation with past and future and an unwillingness to honour and acknowledge the present moment and allow it to be. The compulsion arises because the past gives you an identity and the future holds the promise of salvation, of fulfilment in whatever form. Both are illusions.[54]

This diagram helps us to understand why it is not possible to build machines with artificial general intelligence (AGI), a term that Ben Goertzel and Cassio Pennachin introduced in 2007 to denote "AI systems that possess a reasonable degree of self-understanding and autonomous self-control, and have the ability to solve a variety of complex problems in a variety of contexts, and to learn to solve new problems that they didn't know about at the time of their creation".[55] For, as this book demonstrates in a number of ways, no such machine could have the Self-reflective Intelligence necessary to solve the ultimate problem of human learning. Machines, like computers, function solely in the horizontal dimension of time, as this input-operator-output diagram of the fundamental data-processing structure of all machines, illustrates:



The reason why functions are labelled 'active' is that programs in computers—consisting of a collection of functions, not unlike mathematical functions—are data, just as much as the 'passive' data that they process. This is the essence of the stored-program computer, designed by the eminent mathematician and polymath John von Neumann in 1945,[56] first being built at the Universities of Manchester[57] and Cambridge[58] in England in 1948 and 1949, respectively. Before this, programs that control the functioning of the machine were entered externally from paper tape or set up in switches.[59]

However, programs begin life as passive data, as strings of characters, like pieces of text or algebraic equations on a printed page, now electronic. They are then converted into a string of machine instructions by program generators called compilers or interpreters, such as Objective C and Python. Such programs are used to build generated programs, such as Microsoft Word and Adobe Photoshop. All programs are generated in this way by programs executed by the central processing unit (CPU), including the operating system, such as Mac OS X and Windows, and generated programs and program generators, both of which are applications or apps.

We can see this distinction between active and passive data in computers as analogous qualities in human beings. As Gilbert Ryle pointed out in *The Concept of Mind* in 1949, human knowledge can be considered both as the facts we know and the skills we know how to perform; we 'know that' and we 'know how',[60] which clearly correspond to passive and active data in computers. And just like computers, we have generated or learnt skills, such as playing chess or the piano, and generating or learning skills,

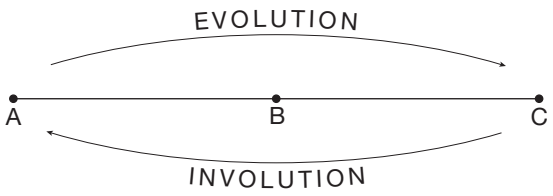
which we call thinking, able to form concepts, as pictures in the mind, that have never existed before, in what Alfred North Whitehead called 'novelty' in *Process and Reality*, the essence of creativity.[61]

But if such creative activities were mechanistic, nothing radically new could ever be created from them. So could a computer program itself to create something that had never existed before? There are mechanisms in some programming languages, such as A Programming Language (APL),[62] designed by Kenneth Iverson of Harvard University and IBM,[63] which allow functions to dynamically generate new functions from strings and execute them. But humans first wrote such generating functions as strings of characters.

We can thus see that the programs that we use in our computers, tablets, and smart phones everyday come into existence by being compiled by other programs in a long cause-and-effect chain. So where did the first computer program come from? The input-operator-output mechanistic process functions at every level of computers, right down to the bit level, and in the linear mathematical logic on which computers are built. So Richard Dawkins' program *The Blind Watchmaker*, which ran under Mac OS 9 on a Power PC processor in the 1990s,[64] designed to show that evolution progresses without Divine intervention, proves no such thing. It is only when we bring the Divine Power of Life into science, bubbling up from the Origin of the Universe, like a fountain, that we can explain what caused Mozart to write his last three magnificent symphonies in just six weeks in the summer of 1788.

Balancing evolution and involution

Most significantly, evolutionary and involutionary processes look utterly different in the Eternal Now from their more usual temporal perspectives. As Ken Wilber said in *Up from Eden*, one of his earliest books, "Thus history, from this viewpoint [the Great Chain of Being], is basically the unfolding of those successively higher-order structures, starting from the lowest (matter and body) and ending with the highest (spirit and ultimate wholeness)."[65] Then, in *Eye to Eye*, he writes "If the movement from lower to higher is evolution, then the reverse, the movement from the higher to the lower, is *involution*," drawing this figure,[66] which we need to rotate anticlockwise ninety degrees. He has inherited this horizontal view of time from Aurobindo, who wrote, "The word *evolution* carries with it in its intrinsic sense, in the idea at its root the necessity of a previous involution."[67]



Rather, in my experience, evolution is the development or unfolding of forms from the Timeless, Formless Absolute, as the Alpha Point of evolution, *A* in Ken's diagram. And while such creative processes normally terminate in structures, such as symphonies, cathedrals, computers, or the global economy, in the case of my own cognitive learning processes, they ultimately terminate in Formless Wholeness, at the Omega Point of evolution, through what Whitehead called 'concrescence', the 'production of novel togetherness'.[68] This is *C* in Ken's diagram. Involution then is the reverse decaying and dying process, as structures dissolve back into Oneness, from *C* to *A*, which are never separate from each other, as illustrated in Ken's three-stage phylogenetic diagram on page 124.

As Aurobindo states, "The Supermind is the Vast; it starts from unity, not division, it is primarily comprehensive, differentiation is only its secondary act."[69] This is a statement that is as relevant to involution as evolution. For both evolution and involution actually take place in the vertical dimension of time, in the Eternal Now, not in the horizontal, where Alpha and Omega, as the beginning and the end, are one, unified in Wholeness.

However, Ken Wilber has said that such a life journey is impossible. Taking a much broader view of the Theory of Everything than physicists like Stephen W. Hawking take, he wrote:

> This book is a brief overview of a Theory of Everything. All such attempts, of course, are marked by the many ways in which they fail. The many ways in which they fall short, make unwarranted generalizations, drive specialists insane, and generally fail to achieve their stated aim of holistic embrace. It's not just that the task is beyond any one human mind; it's that the task is inherently undoable: knowledge expands faster than ways to categorize it. The holistic quest is an ever-receding dream, a horizon that constantly retreats as we approach it, a pot of gold at the end of the rainbow that we will never reach.[70]

Ken then goes on to ask, "So why even attempt the impossible?" To which he replies, "Because, I believe, a little bit of wholeness is better than none at all, and an integral vision offers considerably more wholeness than the slice-and-dice alternatives."[71] He seems to be saying here that Wholeness is like an asymptote in mathematics, which can be approached but never reached in finite time. If so, he is confusing the *in*finite and *trans*finite.

Christian de Quincey expressed a similar view in 2001, when the managing editor of the *Noetic Sciences Review*, the journal of the Institute of Noetic Sciences. In a critical appreciation of Ken Wilber's *Collected Works*, he wrote that the genuine theory of everything is impossible:

> Because you cannot create a model or a map that contains itself. Where, for example, would the four-quadrants model fit into the four-quadrants model? Mathematical and logical proofs developed by Bertrand Russell and Kurt Gödel—along the lines that no set of all sets can itself be a set of the same logical category, type, or level—invalidates the claim. Both Alfred Korzybski and Gregory Bateson immortalized this dilemma with the phrase "the map is not the territory." In this case (Wilber's TOE), not only the map, but more crucially, the consciousness that created the map, cannot be found in its own creation. To attempt to make room for it would involve us (and Wilber) in a logical infinite regress. This meta-critique applies to any TOE, of course, not just Wilber's.[72]

Yet, as this book describes, we can overcome these objections to completing today's revolution in science by understanding that Nondual Wholeness is the Authentic Self, True Nature, and Genuine Identity of every one of us. No one can return Home to Transfinite Wholeness because nobody has ever left Home.

Contextual inversion

Perhaps it is not surprising that people hold such opinions, for this is a characteristic of the way that evolution unfolds. For instance, in the biosphere, how could an amoeba possibly imagine a trout, or a trout a horse, or a horse a human being? Similarly, regarding mental evolution in the noosphere, Plato and Aristotle did not have an evolutionary worldview and would not have understood Charles Darwin's *Origin of the Species*.

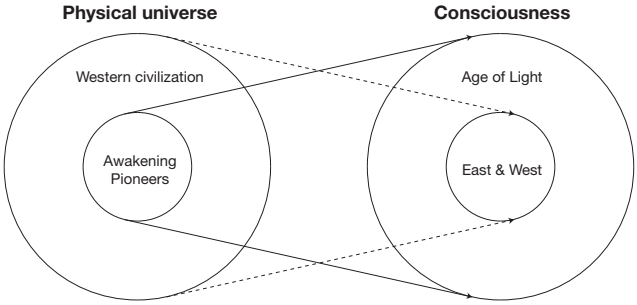
In turn, Darwin's followers do not generally appreciate the broad sweep of Teilhard's evolutionary vision, encompassing the physical, biological, mental, and spiritual realms. And even though Teilhard prophesied that one day all the divergent streams of evolution would converge in a megasynthesis of all knowledge, as the Theory of Everything, he, himself, did not realize this prophecy in his own direct experience. So he did not fully sense and understand what reaching evolution's glorious culmination at its Omega Point actually means. Neither have today's leading evolutionaries, as far as I can tell, often much inspired by Teilhard's visionary prophecy.

Yet, when we stand outside ourselves, looking at the Cosmos with Self-reflective Intelligence, lit by the Coherent Light of Consciousness, we can see that we all live in the same Universe. In the words of the pre-eminent Christian mystic Meister Eckhart, "The eye with which I see God is the same as that with which he sees me."[73] In other words, "Brahman is all, and the Self [Atman] is Brahman," as the *Mandukya Upanishad* says. Or, as the *Chāndogya Upanishad* says, *Tat tvam asi* 'Thou art That,"[74]

reiterated in Nisargadatta Maharaj's *I Am That*, described by Vijai Shankar, an Advaita sage and former medical practitioner, as the only spiritual book you need to read.[75]

Essentially, this is the Eastern worldview, quite distinct from that of the West. To understand how Western civilization has become cognitively and experientially separated from Divine Reality, we need to go back some 5,000 years, to the first civilizations at the dawn of recorded human history. We can contrast the Sumerians living in Mesopotamia and the Egyptians living in the Nile valley with the Rishis living in the Indus valley. All would have had a pristine view of the night sky, unsullied by the light pollution most of us suffer from today, but they developed quite differently. On the one hand, the Babylonians and Egyptians gazed at the stars in wonderment, finding many patterns in what at first sight looks like a bewildering muddle, thus founding the science of astronomy, often called astrophysics today. On the other hand, the Rishis ignored the night sky and looked inwards, discovering an utterly different Universe, one in which there is no division between humanity and Divinity.

So healing the split between mysticism and science will bring about the biggest change in Western thought since the Babylonians began to map the skies. For today we are engaged today in a contextual inversion, which is truly a revolution, from Latin *revolvere* 'to turn over, roll back', far more revolutionary than the popular terms *paradigm change* and *paradigm shift* indicate, as this diagram illustrates.



How I have come to this realization, I explain in the next chapter, describing some of the most relevant events in my own ontogeny. An outline description of the Numinosphere, noosphere, biosphere, and hylosphere then follows, showing that the physical spheres studied by the so-called natural sciences need to be reinterpreted by a coherent system of thought in the noosphere in the light of what is mistakenly called the supernatural.

For the word *physics* derives from Aristotle's treatise *Physics*, a translation of Greek *ta phusika*, literally 'natural things', the neuter plural of *phusikos* 'of nature', from *phusis* 'birth, origin; nature, inborn quality' and *phuein* 'produce, bring forth; grow, be born', from Proto-Indo-European (PIE) base **bheuə-* 'to be, exist, grow', also root of *be*. In turn *nature* derives from Latin *nātūra* 'birth', from *nātus*, past participle of *nāscī* 'to be born', from PIE base **genə-* 'to give birth, beget', also root of Greek *genesis* 'origin, birth', from which *genetics* and many similar words are derived.

Yet, physicists and biologists do not study the natural origin or birth of things, even denying the very existence of the Divine Source that we all share. Rather, mystics are the true physicists, in touch with the supernatural Origin of the Universe, which is entirely natural. In Reality, everything in the world of form, including our bodies, minds, and souls, is born from the Natural Numinosphere, as Consciousness.

I conclude this treatise culminating my life's work with a brief review of what such a radical transformation of consciousness could mean for the prospects for humanity, as evolution leads us into the eschatological Age of Light after it has passed through its Singularity in time, called its Accumulation Point in systems theory terms. Such a momentous event will require quite different ways of organizing society, which we explore a little in the final chapter on the Alliance for Mystical Pragmatics.

2. An Ontogenetic Perspective

I began puzzling about how to end the war between science and religion as a seven-year-old in 1949, when I was taught to recite the Lord's Prayer by rote. For the opening words of Pater Noster are "Our Father, which art in Heaven." But what does this mean? I asked myself. I was taught that *Father* is the first person of God in the Christian trinity: Father, Son, and Holy Spirit or Ghost. And I was taught that *heaven* is a word that denotes the sky above me. But how could God live in outer space? As a boy, beginning to think for myself, this did not make any sense to me, making it very difficult to learn anything at school and university. It was not until I came to write this book on *The Four Spheres*, as the culmination of my life's work, that I was able to fully make sense of all my experiences, from the mystical to the mundane.

For whenever we form concepts, we do so within particular domains of discourse, which provide the contexts for the various cultures, disciplines, and specialisms into which we have divided the world of learning. So what are we to make of the concepts of God and Universe, which provide the overall contextual concepts for religion and science, respectively? These contexts are incompatible, making it virtually impossible to determine the truth or otherwise of what we are being taught by the cultures and subcultures we live in. As a boy and adolescent, my teachers at school and university could not tell me how to reconcile these incompatibilities, for they, themselves, did not know how to do so.

Furthermore, I was born into a world that was, and still is, at war with itself. And at the heart of all these wars is the long-running war between science and religion, which people like Deepak Chopra, a medical practitioner and renowned spiritual teacher, and Leonard Mlodinow, co-author with Stephen Hawking of *The Grand Design*, are still waging.[76] This is very sad, for Consciousness, with a capital *C*, is the Absolute, as Ultimate Reality, which we can know with Absolute certainty, without argument or debate. However, as a seven-year-old, I did not know this and so set out to explore the relationship between the concepts of God and the Universe—as the Supreme Being and Ultimate Reality, respectively—seeking to reconcile them so that I could live in Love and Peace, free of conflict and suffering.

This has meant that my ontogeny has been quite different from that of my contemporaries. Normally, in the biosphere and noosphere, ontogeny recapitulates the phylogeny of the species and culture, respectively, an obvious evolutionary relationship that Ernst Haeckel suggested in the mid 1800s for biogenesis, apparently now discredited.[77] However, as neither Western civilization nor any other culture or subculture that I know of can show us how to heal the splits between science and spirituality, mathematics and mysticism, reason and religion, and East and West, I have, of necessity, needed to spend most of my life in solitude, pursuing my life's purpose in my own unique way.

When I look at my entire life from my conception in the late summer of 1941 to the present day, I can see that I only felt reasonably assimilated into the culture I had been born into for just fifteen years.

During my education, I only learned what my teachers wanted me to learn at the ages of eleven and sixteen, when I won school prizes, and at eighteen, in my first year at university, when I was in line for a good honours degree in mathematics. The other twelve years occurred between the ages of twenty-two and thirty-four, when I abandoned my search for Wholeness and the Truth to get married, bring up children, and pursue a managerial business career in the conventional manner.

Most significantly, at seventeen, I abandoned physics as the primary science on which all the sciences are built, for reasons described on page 105 in the chapter on 'The Hylosphere'. So I studied economics as the required subsidiary for a year, rather than physics, as most did. However, I failed my economics exam because the concept of money in macro- and microeconomics made no sense to me in my lifelong pursuit of Love and Peace. In my second year, I therefore switched to statistics as a subsidiary. I did not feel much affinity for the subject, for while probability theory can reveal patterns in the world we live in, it does not really tell us the root cause of our expectations and hypotheses, a central issue we return to when contemplating humanity's ultimate destiny.

Nevertheless, I did manage to pass the statistics exam, which enabled me to complete my three-year course. However, I failed my finals the first time I sat them because I felt deeply depressed living in an alien culture that made no sense to me. As I know today, this is because Western civilization is based on the assumption that we are separate from the Divine and each other. Even my beloved mathematics could not save me, not the least because the arcane subject of mathematical logic clearly does not represent the nonlinear way in which we humans think and organize our ideas. In the event, with the wonderful support of a woman professor, who could see my potential, I did manage to pass my finals at the second time of asking and so obtained my ticket to the world of work.

The great benefit of my dismal academic career is that I had comparatively little to unlearn when I came to rebuild the entire world of learning from a *tabular rasa* 'blank slate' at the age of thirty-eight. Virtually everything I have learnt in life I have learnt since then as an autodidact. But first I needed to learn my trade in the business world.

Looking inwards

All went quite well until 1977, when I began to return to my life's purpose as the result of a major midlife crisis when working as a systems engineering manager in an IBM sales office in London. This mental breakdown brought my managerial career to an end, leading me to reflect on my profession in the information technology industry. Until that time, I had felt that I was making a worthwhile contribution to society by helping to automate people's jobs. For I thought that this would help free them from drudgery, enabling them to be more creative and thereby have more satisfying jobs.

However, in the late 1970s, I saw for the first time that this was not happening at all. Businesses were becoming more and more rigid and authoritarian, as people were trapped in a mechanistic economic system that had made no sense to me when I studied economics at university in the early 1960s. And we were just a few years away from George Orwell's Nineteen Eighty-Four.

It was while reflecting on these trends that I realized how little we in the industry understood about the stored-program computer, invented at the end of the 1940s, as mentioned on page 7. For the computer is a device quite unlike any other that our species has invented during the past two hundred thousand years. For unlike the flint axe, wheel, printing press, telescope, steam engine, and telephone, for instance, which extend our rather limited physical abilities, *the computer is a tool of thought, able to extend*

the range of the human mind—even in some cases replacing it. Physics, as the science of mass, space, and time, is thus quite unable to explain what we have invented.

As a corollary, I realized how little I understood about the inner workings of my mind and consciousness, about what it truly means to be a human being, even though I had begun to look inwards to discover why we humans behave as we do when I was promoted to first-line manager in January 1974. For the man in charge of managerial education knew that we could not be effective leaders of our staff without some understanding of ourselves and what motivates us all, drawing on Abraham Maslow's hierarchy of needs,[78] Frederick Herzberg's 'hygiene factors' for job satisfaction and dissatisfaction,[79] and Douglas McGregor's theories X and Y of human motivation.[80] At about the same time, some friends introduced me to Eric Berne and Thomas A. Harris's transactional analysis, with its simple parent-adult-child (PAC) model of interpersonal communication.[81]

However, these psychological theories of human behaviour and communications did not provide me with the tools I needed to determine to what extent robots could replace jobs being performed by human beings. I saw just two possibilities. Either computer scientists could build machines with artificial intelligence exceeding any level of intelligence that we humans might aspire to or they could not, for some, as yet, unknown reason.

Either way, it was clear that the global economy held the seeds of its own destruction within it. If AI were possible, then the cycle of humans as both workers and consumers in the economy would one day be broken, the fundamental principle of capitalism. For as Adam Smith wrote in 1776 in the opening words of *The Wealth of Nations*: "The annual labour of every nation is the fund which originally supplies it with all the necessaries and conveniences of life which it annually consumes, and which consists always either in the immediate produce of that labour, or in what is purchased with that produce from other nations."[82]

And if AI is not possible, there must be something about human beings that exceeds the limits of technology, materialistic science, and the mechanistic, monetary economy. In this case, the situation would be the same, for technological development could not drive economic growth indefinitely. But discovering the essential difference between humans and machines has meant that I have needed to make the most radical change in the work ethic since our forebears began to settle in communities to cultivate the land and domesticate animals, some 10,000 years ago.

This radical change in the way I live and work began during the winter of 1980, when developing an innovative national marketing strategy for decision support systems for IBM in London. To determine whether the inherently unstable global economy would self-destruct because AI is possible or is not, I set out to model the thought processes of information systems architects with the comprehensive business modelling methods that were just then emerging at the birth of what the social scientist Daniel Bell called the Information Society. For, as he pointed out, "we have no economic theory of information, and the character of information, as distinct from the character of goods, poses some novel problems for economic theorists."[83]

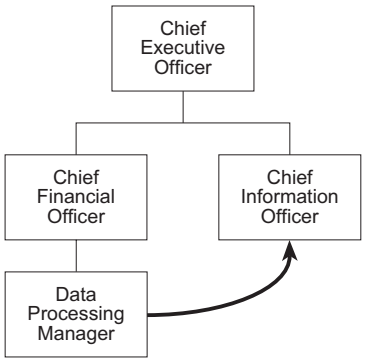
To reflect this radical change in the way that businesses are managed, IBM in the UK developed a marketing strategy in 1979 with the slogan, 'Manage data as a corporate resource.' The purpose was to raise the awareness of executive directors of the benefits of information technology for effective decision-making and efficient operations, marking a major watershed in the evolution of the data-processing industry.

During the first three decades of the Computer Age, applications were mainly developed by professional systems analysts and programmers working within a data-processing department, whose

manager reported to the finance director, for among the first applications to be partially automated were accounts receivable and payable and payroll.

However, during the 1970s, it was realized that this situation could not continue for very much longer, for DP departments simply could not cope with the demand, as Richard L. Nolan, in particular, pointed out in an article in the *Harvard Business Review*.[84] Application development had to spread throughout the entire enterprise, giving professionals and managers the opportunity to do their own personal computing. So the computer industry evolved a little like the car industry, in which specialist chauffeurs drove the first cars. With the introduction of personal computing, people learned to 'drive' their own cars.

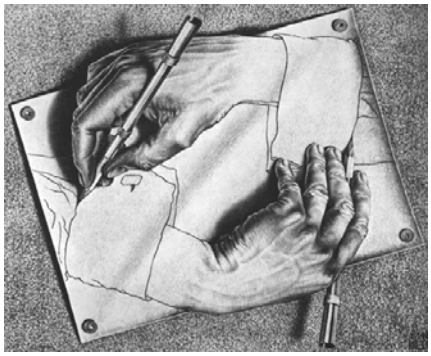
Furthermore, it was realized at about this time that data, whether it be passive or active, defined on page 7, is a resource of a business enterprise and needed to be managed like any other resource, like the four m's: machines, material, money, and men (and women, of course). In IBM's customer terms, to fulfil this need, the data-processing manager became a Chief Information Officer (CIO) on a par with the Chief Financial Officer (CFO), both reporting to the Chief Executive Officer (CEO), as this diagram illustrates.



But what is the relationship of the CIO, managing information, and the CFO, managing money? Well, money is a type of information and so can be represented in the semantic models developed by information systems architects. But this is not possible the other way round. The meaning of information, and hence its value, cannot be satisfactorily represented in the quantitative financial models of accountants, bankers, and economists.

What this means is that if we are to intelligently manage our business affairs with full consciousness of what we are doing, we need to do so primarily through the modelling methods of information systems architects rather than the financial modelling methods of accountants. To explain this, in order to obey the economic imperative of our times, replacing as many jobs performed by humans by machines as possible, IS architects develop models of dynamic business processes, such as designing, manufacturing, marketing, ordering, and invoicing, and their relationships to each other, as well as integrated models of static classes of information in enterprises, such as employees, customers, products, locations, and deliveries. At first, these are very abstract models, not concerned whether humans or machines perform business processes. This distinction is only made at the implementation stage of systems development.

However, in general these mapmaking methods are not deep enough to produce a complete map of the psychodynamics of business enterprises. To develop a comprehensive, all-inclusive conceptual model, IS architects need to consciously model their own mapmaking processes. Consciously thinking in this healthy way is rather like a television camera filming itself filming, which sounds impossible, brilliantly illustrated by Escher's famous lithograph 'Drawing Hands'.[85] For which comes first, the territory or the map?



The conventional scientific view is that the territory comes first. For instance, in 1931, when commemorating the centenary of James Clerk Maxwell's birth, Einstein wrote, "The belief in an external world independent of the perceiving subject is the basis of all natural science."[86] Similarly, at about the same time, Alfred Korzybski made the famous assertion, "A map *is not* the territory it represents, but, if correct, it has a *similar structure* to the territory, which accounts for its usefulness."[87]

Yet to understand how to intelligently manage our business affairs with full consciousness of what we are doing, the territory being studied needs to include the mind, where maps of the territory are formed. In other words, it is necessary to recognize that the observer and observed cannot be separated, a principle that brought David Bohm and J. Krishnamurti together around 1960.[88] Yet, as Bryan Magee tells us, " 'Cartesian dualism', the bifurcation of nature between mind and matter, observer and observed, subject and object … has become built into the whole of Western man's way of looking at things, including the whole of science."[89]

'Discovery' of synergistic psychospiritual energies

It was while trying to solve this apparently impossible, dualistic problem that I asked myself another related question. We technologists in the information technology industry and scientists in general are causing the pace of evolutionary change in society to accelerate exponentially, aided and abetted by computer technology. But, what is causing us and driving us to behave in this way?

I was given the answer to this, the most critical unanswered question in science today, in a gigantic, apocalyptic eureka moment at 11:30 on Sunday 27th April 1980 at 51° 26' 30" N, 0° 14' 02" W as I was strolling across Wimbledon Common in London to the pub for lunch. Puzzling about what was causing my colleagues in IBM and me to change people's lives through the development of information systems in business, I realized that there are nonphysical, mental energies at work in the Universe, as well as the material ones I had learnt about in physics at school.

At the time, I was puzzling about IBM's marketing slogan 'Manage data as a corporate resource' and the differences between active and passive data in humans and machines. But what is data? I asked myself. And how comes it has so much power to change our lives? Well, in a blinding flash of inspiration, I realized that data is energetic, for active and passive data are rather like kinetic and potential energy in mechanics.

Another contributing factor for the emergence of this idea was an IBM conference that I had attended in Toronto in the spring of 1979 to discuss the marketing of and product requirements for decision support systems, implying "the use of computers to assist managers in their decision processes in semistructured tasks".[90]

There I learned the word *synergy*, which then denoted the additional information that is available from relationships between data elements in integrated databases, creating wholes that are greater than the sum of the parts. For *synergy* derives from Greek *sunergos* 'working together', from *sunergein* 'to cooperate', from *sun-* 'together' and *ergon* 'work', also the root of *energy* 'at work', which derives from *energeia* 'activity, efficacy, effect', from *energes* 'active, busy, working', from *en-* 'at'. In ancient Greece, a fellow-worker was called *sunerithos*. It is clear from this that *energy* and *synergy* originally referred to human activity and work. Aristotle seems to have had this meaning in mind when he is reputed to have said, "The energy of the mind is the essence of life."

On my return home to the UK, I looked up *synergy* in the *Oxford English Dictionary* in my local library and found that the first recorded use of the word in English was in 1660, when it meant 'cooperation', specifically between human beings, in contrast to 'sensless stock or liveless statua'. However, *synergy* was not in my rather battered edition of the *Concise Oxford Dictionary of Current English*. *Synergy* did not reach this popular dictionary until its sixth edition in 1976, when it specifically meant something like 'the combined action of two or more substances in the body whose joint effect is greater than the sum of their individual effects'. The eleventh edition, published in 2004, now titled *Concise Oxford English Dictionary*,

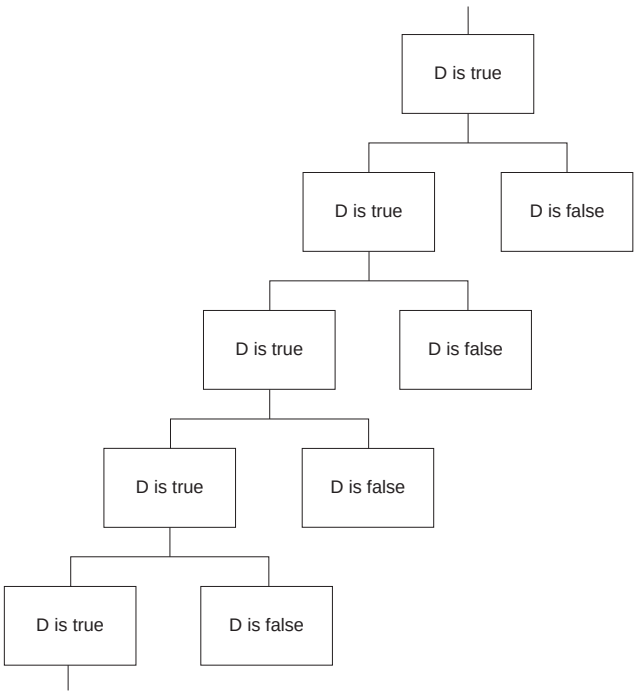
has this more general definition: "interaction or cooperation of two or more organizations, substances, or other agents to produce a combined effect greater than the sum of their separate parts".

Today, it is widely recognized that synergistic effects are ubiquitous, appearing in a wide variety of contexts and environments. However, in 1980, I did not know this. Back then, the idea that data is synergistically energetic blew my mind, for I realized at once that I had been given the key that would unlock all the innermost secrets of the Universe that had puzzled me as a boy. It was as if a big bang had exploded in the depths of my being, like a Kundalini awakening,[91] which William R. Miller and Janet C'de Baca explored in *Quantum Change: When Epiphanies and Sudden Insights Transform Ordinary Lives*.

What they found is that quantum changes could be categorized in two types, with much overlap between them: insightful and mystical. We could also call the former cognitive, while Miller and C'de Baca call only the latter epiphanic. In a sudden insight, "a person comes to a new realization, a new way of thinking," rather like the familiar 'aha' experience, but much deeper and of such a magnitude as "to leave the person stunned or breathless". In such cases, "There may be no immediate sense of being acted upon or in the grip of something beyond the self, as is usually the case with epiphanies."[92]

The Principle of Duality

Accordingly, three weeks later, I resigned from IBM in great excitement and set out to create a cosmology of cosmologies that would unify the creative synergistic psychospiritual energies working within us all with the four physical energies recognized by materialistic science: gravity, electromagnetism, and the strong and weak nucleic forces.



Then around midsummer 1980, I was given the idea that has consciously guided every moment of my life ever since. Recognizing that the existence of nonphysical and physical energies is a special case of dualities in mathematics, I formed the proposition, D: "A complete conceptual model of the Universe consists entirely of dual sets," drawing this diagram. I called D the **Principle of Duality**, inspired by the principle of duality in projective geometry, where points and lines are interchangeable—duals of each other.

But is D true? Well, sometimes yes and sometimes not. For instance, a collection of entities without a common attribute does not form a set, which we usually call miscellaneous. But now something quite incredible happens! Those occasions when D is false are the opposite of those occasions when D is true, confirming that D is true. In the terms of Hegel's dialectical logic, if 'D is true' is the thesis and 'D is false' is the antithesis, then 'D is true' is the synthesis. There is thus a **primary-secondary relationship** between the truth and falsity of the Principle of Duality, illustrated in the diagram. So it is impossible to deny the truth of the Principle of Duality, for any denial confirms its veracity. The paradoxical Principle of Duality is an irrefutable truth, which emerges directly from the Divine Origin of the Universe.

The Principle of Duality not only models black and white situations. It also includes ranges of values, with the extremes being the dual of intermediate shades of grey. Pairs of opposites are mapped in the

multidimensional Cross of Duality, illustrated here, such as Jung's psychological types of extrovert and introvert and rational (thinking and feeling) and irrational (intuition and sensation).[93]

	B	not-B
A	{A,B}	{A,not-B}
not-A	{not-A,B}	{not-A,not-B}

During the Second World War, Katharine Cook Briggs and her daughter Isabel Briggs Myers added a fourth dimension to the cross of duality, which they call the lifestyle dimension, consisting of judging and perception, which Jung regarded as synonyms of the pairs of the function types. They thus formed the popular Myers-Briggs Type Indicator (MBTI), which is a psychometric questionnaire designed to measure and assess psychological preferences in how people perceive the world and make decisions.[94]

At the time that the Principle of Duality was revealed to me, I felt as if I had entered a quite new universe, where I could play with paradoxes and self-contradictions to my heart's content, rather than rejecting and denying them, as we are encouraged to do by mathematics, logic, science, and philosophy today. This wonderful transformation can best be described with John Tenniel's illustrations for Lewis Carroll's second book on Alice's adventures in wonderland: *Through the Looking Glass*. The room that Alice lived in is rather like the boxes that we incarcerate ourselves in by identifying with particular bodies, cultures, species, planets, galaxies, or universes, in an either-or fashion. It is by following Alice through the looking glass that we can discover a totally different world outside: a both-and world where words take on quite new meanings. And then we are free, totally free. For this looking glass is actually a two-way mirror. When we are in the room, all we can see is our reflection, where left and right are interchanged, while top and bottom are not. But when we pass through the mirror, we can see both the wide-open Cosmos outside the room and into the room itself, where people still live their lives most of the time.

The Omega Point of evolution

In April 1982, when I has helping to design and implement a management accounting system for the Kuwait Institute for Scientific Research (KISR), I realized that the Principle of Duality had led evolution to carry me from its Alpha Point to its Omega Point, in Teilhard's terms. For, as he prophesied, all the divergent streams of evolution would one day converge in a megasynthesis of all knowledge,[95] a megasynthesis that was growing and expanding within me at superhyperexponential rates of development.

Quite amazingly, in just two years, fourteen billion years of evolution had reached their glorious culmination within this being that I am, not easy to explain, understand, or even imagine until it actually happens to you. At the time, I saw this coherent vision emerging within me like the development of an old-fashioned chemical photograph. Although I could see the picture as a whole, it was very fuzzy, taking most of my adult life to become ever clearer, eventually merging back into the *tabula rasa* 'blank slate', whence it began.

This was, at once, the most exciting and terrifying moment in my life, essentially because I was not yet grounded in Immortal Reality, free of attachment to my identity as a human being. For, as I can see now,

I was experiencing what Christina and Stanislav Grof call a 'spiritual emergency',[96] as Spirit was emerging faster than my body-mind-soul organism could handle.

Most significantly, I could see that not only would Western civilization and the global economy come to an end in my lifetime, *Homo sapiens* would become extinct within just a few generations. In other words, one day, a generation of children will be born who will not grow old enough to have children of their own, falsifying the most fundamental assumption of life on Earth. As a species, we are not born to procreate indefinitely, through infinite time. In the not too distant future, much earlier than most seem to recognize, time will have come to an end, returning us to the Divine, to the Bliss of the Eternal Now.

Not surprisingly, as a result of this all-encompassing Cosmic vision, I experienced deep existential fear, which it has taken me over thirty years of profound self-inquiry to deal with, realizing that we can only resolve our existential fears by passing through a psychological death before the death of our bodies, as both individuals and as a species. I have been greatly helped in this respect with Shakyamuni Buddha's three marks of being (*trilakshana*):

1. There is nothing whatsoever that is permanent in the Universe, including our bodies and any groups, from our family, through our cultures, to our species, that we feel we belong to (*anitya*).
2. If we do not recognize this fundamental principle of existence, we shall suffer (*duhkha*).
3. The way to end suffering is to be free of the sense of a separate self, of attachment to the egoic mind (*Anatman*), leading to *Moksha* 'liberation and release from worldly bonds', *Nirvāna* 'extinction', and *Kaivalya* 'Solitude, Absolute Consciousness'.

The Principle of Unity

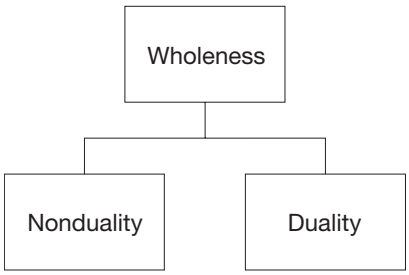
However, the Principle of Duality, as it was formulated, was not sufficient to bring the Absolute Whole into science, necessary if I were to heal the split between mysticism and reason. This began to happen cognitively in October 1983, when I was once again strolling across Wimbledon Common, but in the opposite direction from three and a half years earlier. Using David Bohm's method for bringing order to quantum physics, I was able to form the concept of the Formless Absolute in exactly the same way as I form concepts of beings in the relativistic world of form.

For, as Bohm pointed out, we can bring universal order to our thought processes by "*giving attention to similar differences and different similarities*", a notion of order that the artist Charles Biederman had given him.[97] In other words, we carefully examine the similarities and the differences in the data patterns of our experience, putting our interpretations into various sets as appropriate. The concept of set here is central to egalitarian concept formation and pattern recognition, and hence conscious evolution, as a group of mathematicians in the USA and UK recognized in the 1960s, introducing the 'new maths' into primary and elementary schools,[98] attended by seven to ten year-olds.

By transcending the categories and unifying all opposites in order to form the concept of the Absolute, the Principle of Duality became the **Principle of Unity**, expressed in just seven words *Wholeness is the union of all opposites* or six mathematical symbols, which I today call the Cosmic Equation, where A is any being, W is any whole, $\cup$ is union, and ~ is not:

$$W = A \cup \sim A$$

This universal, irrefutable truth is the keystone of the Universe, its fundamental design principle, enabling us to unify the incompatible concepts of God and Universe in Wholeness, as illustrated in the next diagram. The Cosmic Equation is a theorem in mathematical logic that cannot be proven to be true



from any set of axioms. As such, it is the equation that Albert Einstein spent the last thirty years of his life seeking to find at the heart of his unified field theory.[99] It is the simple, elegant, all-encompassing equation that can explain everything, the key that opens all the innermost secrets of the Universe. For the Cosmic Equation is the equation that Stephen W. Hawking has spent a lifetime searching for, as we were told in the movie *The Theory of Everything*, receiving an Oscar for Best Actor for Eddie Redmayne in 2015.

We can see why the Cosmic Equation is so elusive from the word *preposterous*, which means 'contrary to reason or common sense; utterly absurd or ridiculous', from Latin *præposterus* 'having the last first, inverted, perverse, absurd', from *præ* 'before' and *posterus* 'coming after, following'. So *præposterus* was a Latin oxymoron, my favourite word as a teenager, from Greek *oxumōron*, neuter of *oxumōros* 'pointedly foolish', from *oxus* 'sharp' and *mōros* 'foolish, dull'. So when people intelligently look at both sides of any situation, they can be called two-faced, meaning 'insincere, deceitful', and indecisive. In this respect, Barack Obama, one of the most intelligent politicians in the world today, is sometimes considered weak because he is constantly attempting to reconcile the warring parties in the United States Congress in a bipartisan approach.

Such are the problems we face when we live superficial lives, afraid to dive into the depths of the Cosmic Psyche to discover why we think and act in the way that we do. Heraclitus of Ephesus aptly called the Principle of Unity the 'Hidden Harmony', saying in the few fragments that have survived, "The Hidden Harmony is better than the obvious" and "Opposition brings concord; out of discord comes the fairest harmony."[100] In contrast, Aristotle said in *Metaphysics*, "It is impossible for the same attribute at once to belong and not to belong to the same thing and in the same relation … as some imagine Heraclitus says,"[101] a statement known today as the Law of Contradiction, the implicit axiom for deductive logic and mathematical proof.

In Eastern terms, the Principle of Unity is the ultimate Integral Tantric Yoga, for *yoga* is Sanskrit for 'union', cognate with the English words *yoke*, *join*, and *syzygy* 'conjunction', from Greek *suzugiā* 'union', from *sun-* 'together' and *zugon* 'yoke'. This unifying principle provides a synthesis of all forms of yoga, including Aurobindo's integral yoga.[102] And in Taoism, Laozi said in *Tao Te Ching*, "When all the world recognizes beauty as beauty, this in itself is ugliness. When all the world recognizes good as good, this in itself is evil."[103]

However, this Holy Grail, Philosophers' Stone, and Apotheosis of human learning is not entirely unknown in the West. The alchemists have long known about this ultimate purpose in life, the idea of changing base metal into gold being a metaphor for the spiritual transformation of consciousness. For as Jay Ramsay writes in *Alchemy*, "Above all, alchemy is about wholeness." "It brings spirit and matter together rather than separating them. It is profoundly non-dualistic in this sense, as opposed to the orthodox Christian Church." "Alchemy is vibrant: it reaches to the source of life." It is "a physical process to do with self-knowledge".[104]

In the fifteenth century, Nicholas of Cusa, paradoxically both a mystic and Catholic cardinal, also discovered this universal truth, introducing the term *coincidentia oppositorum* 'coincidence of opposites' as a way of approaching the Divine.[105] Then in the twentieth century, Carl Gustav Jung, much influenced by the alchemists and Cusanus, well understood that unifying opposites is the key to sound mental health,[106]

in 1959 calling syzygy the androgynous union of *anima* and *animus*,[107] at the centre of his psychospiritual goal of individuation—the development of an undivided being.

Thirty years earlier, Jung had written in his *Commentary* to Richard Wilhelm's translation of *The Secret of the Golden Flower*, "The Chinese have never failed to recognize the paradoxes and the polarity inherent in all life. The opposites always balance on the scales—a sign of high culture. Onesideness, though it lends momentum, is a mark of barbarism."[108] And as Jung said in 1935 to his fellow psychotherapists, "The greatest danger that threatens psychology is one-sidedness."[109] As Cary Baynes said in her 1931 English translation of Jung's *Commentary*, "the East creeps in among us by the back door of the unconscious."[110]

We can see the significance of the Cosmic Equation in the history of ideas from a Horizon drama documentary titled 'Einstein's Unfinished Symphony', which the BBC originally broadcast in the UK in 2005. As Michio Kaku said, if Einstein had been successful in his aim of developing what he called the unified field theory, "The theory of everything would have been the holy grail of science; it would have been the philosophers' stone. It would have been the crowning achievement of all scientific endeavours ever since humans walked the face of the Earth."[111]

Unifying mysticism and science

However, cognitively forming the concept of the Absolute in 1983 with utmost rigorous reasoning was not enough to establish God as a scientific concept, for my experience of the Divine was not yet sufficiently deep. Furthermore, having spent most of my life isolated from my fellow human beings, I still had many psychological issues to deal with. In addition, although I was frequently experiencing the wonderful sense of Ineffable Wholeness, not unlike people having an out-of-body, near-death experience, I had not yet found a language in which to describe my experiences.

In a private conversation with David Bohm in the mid 1980s, he suggested a solution to this problem. We need to study the roots of words, which he aptly called the *archaeology of language*. For the root of *etymology* is Greek *etumos* 'real, true'. So by studying etymology we discover that our forebears were much closer to Reality than most people are today. Particularly interesting is the supposed Proto-Indo-European language, as the common ancestor for the ancient languages of Sanskrit, Persian, Greek, and Latin, and the modern languages that have evolved from these and others, described on page 91.

While seeking a suitable language in which to describe my experiences, these really began to deepen in the late 1990s, when a former girlfriend told me about *Consciousness Speaks* by Ramesh S. Balsekar, an Advaita sage and former President of the Bank of India. For here was a rare book that honestly spoke to me in my own direct experience, confirming the universal truth of the Principle of Unity, leading to Nondual Wholeness. As Wayne Liquorman, its editor, wrote in the Introduction, "All there is, is Consciousness. If that is understood completely, deeply, intuitively then you need read no further. Put the book down and go on joyously with the rest of your life."[112]

At the time, I had just taken early retirement from IBM, which I had rejoined in 1990 in Stockholm at its Nordic Software Development Laboratory, after marrying a Norwegian meditation teacher and social activist in 1986. So I then had the wonderful opportunity to go much deeper into myself, attending many retreats and satsangs that several spiritual teachers were holding in Scandinavia. As a result, in the early years of the millennium, I experienced a number of liberating *satoris* or *kenshos* in Zen terms in the mountains of Norway and the forests of Sweden. For the first time in my life, I understood what it means to be a genuine mystic, completely free of the sense of a separate self, momentarily, at least.

Communicating insights and experiences

But could I maintain this beautiful sense of equanimity, not only in solitude, but also in the hurly-burly of a dysfunctional society at war with itself? In the event, this has proved the greatest challenge of my life, requiring much inner searching and resolute strength of purpose. I began attempting to go out to the world in 2004, when I self-published a book titled *The Paragonian Manifesto: Revealing the Coherent Light of Consciousness*. This book was called a manifesto because it was intended as a nondualistic, spiritual response to *The Communist Manifesto*, written by Karl Marx and Friedrich Engels in 1848, shortly before the great revolution in Europe of that year.

I coined the word *paragonian* on 29th October 1984, following several weeks searching Greek and Latin dictionaries in Wimbledon library in London. The word derives from the Greek words *para* 'beyond', and *agon* 'contest' or 'conflict', a word that is also the root of *agony*, until the 17th century meaning 'mental stress', *antagonist* 'a person who one struggles against', and *protagonist* 'leading person in a contest'. *Paragonian* thus means 'beyond conflict and suffering', a healthy, liberated, and awakened way of being that we can realize when we are both unified with the Divine and integrated with the Cosmos; when we base our lives firmly and squarely on our immortal Ground of Being. *Paragonian* thus denotes the essence of *Advaita* ('not-two') in a word with a Western etymology.

As the coordinating framework for the post-capitalist, post-communist Sharing Economy, the book introduced Integral Relational Logic (IRL), the commonsensical art and science of thought and consciousness that we all implicitly use everyday to form concepts and organize our ideas in tables and semantic networks or mathematical graphs. IRL is so named because it came into being through the action of what Heraclitus called the Logos, 'the immanent and rational conception of divine intelligence governing the Cosmos'.[113] This all-inclusive system of thought thus solves the business management problem that I was wrestling with during the winter of 1980. It could therefore provide the infrastructure of the moneyless Sharing Economy because it has evolved from the semantic, mathematical, and logical modelling methods that information systems architects use to build the Internet.

These abstract mapmaking systems are of such generality that they are applicable in all cultures, industries, and disciplines. If this were not the case, the Internet could neither exist nor expand at hyperexponential rates of acceleration. This means that *The Paragonian Manifesto* could not be published within any particular genre. Like this book on *The Four Spheres*, it was addressed to the whole of humanity, not to any particular group, subculture, or culture.

Accordingly, I published it within the transcultural transdiscipline of Panosophy, modelled on *philosophy*, from Greek *pan* 'all' and *sophia* 'wisdom'. The ancient Greeks used the word *pansophos* to mean 'very wise', literally 'all-wise'. *Pansophy* was first used in English in 1642 in Samuel Hartlib's translation of *Prodromus Pansophiæ* by Jan Ámos Komenský (Comenius), who has been called the 'father of modern education'. *A Reformation of Schooles*, in its English title, was a prospectus for a universal cyclopædia, *pansophy*, occasionally spelled *pantosophy*, coming to mean 'universal or cyclopædic knowledge; a scheme or cyclopædic work embracing the whole body of human knowledge'.[114] Pansophy formed the basis of Pansophia, 'a dream of science', the vision of a Utopian society, to this day still not realized, as Frank E. and Fritzie P. Manuel point out in their scholarly tome *Utopian Thought in the Western World*.[115]

For myself, I prefer the word *panosophy* to denote the Theory of Everything, which I also call the Unified Relationships Theory (URT), as the complete unification of science, philosophy, and religion, of all sciences and humanities, consummating the sacred marriage of science and spirituality.

However, despite much interest in healing the split between mysticism and science, *The Paragonian Manifesto* sold very few copies. It was far from being the best-seller I felt it had the potential to be. Clearly, neither the world nor I were ready for such a revolutionary book, putting Western civilization back on its feet, for today it is standing on its head, far removed from Reality, as we see in the diagram on page 10.

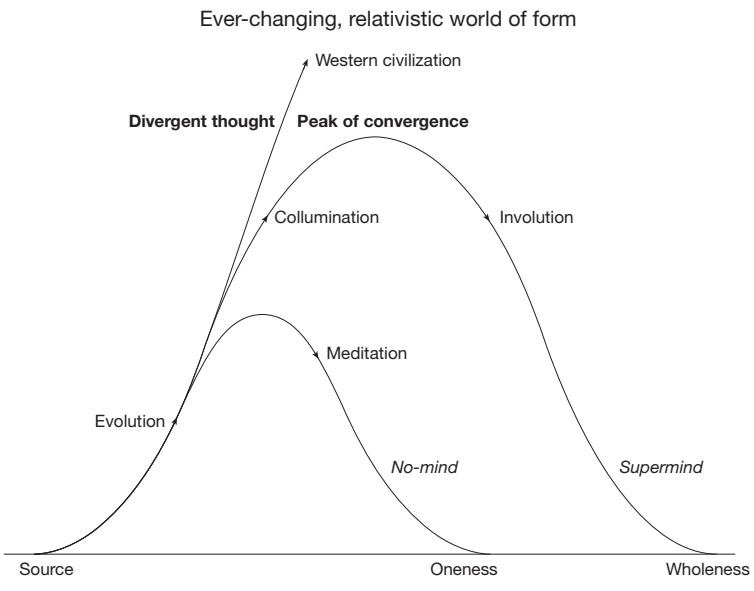
Returning to society

I began to see why *The Paragonian Manifesto* was universally rejected in 2007. Since 2000, I had been attempting to present Panosophy within the context of Western civilization, when I, myself, felt that I no longer belonged to the culture I had been born into. The fifteen years when I had been reasonably assimilated into this dysfunctional civilization were long gone. So I was not being true to myself, not truly writing and speaking from the perspective of Wholeness, transcending all categories.

Accordingly, I set out to reorganize all my writings, starting afresh at the very beginning, at the Alpha Point of evolution. However, there was still one puzzle I needed to resolve. Mystics from India, like Ramana Maharshi, J. Krishnamurti, Ramesh S. Balsekar, Vimala Thakar, Osho, and Vijai Shankar were not saying anything that I did not understand in my own direct experience. Yet, somehow there was a difference in their spiritual journeys from my own. What could this be? I asked myself.

Also puzzling about the relationship of evolution and involution that Aurobindo and Ken Wilber presented in their writings, as mentioned on page 8, I found the answer to this question on the first morning of a six-day retreat in the Altai Mountains in southern Siberia. This is the original home of the shamans and a possible location for Shambhala, which Chögyam Trungpa described as a mythical "place of peace and prosperity, governed by wise and compassionate rulers",[116] called 'Shangri-La' in James Hilton's 1933 novel *Lost Horizon*.

Nukunu, one of my spiritual teachers and now a neighbour, had invited me to this retreat in Paradise because the previous year I had edited one of his books on the commentaries of the Gospel of Thomas titled *The Spirit of Fire*, writing a foreword for the book. Then, when he was speaking to a mainly Russian audience, I drew this diagram, which answered all the questions I had about my relationship with my fellow human beings in the simplest possible way.



This diagram illustrates two extreme ontogenies and a middle path between the two, necessary if we are to heal the split between mysticism and science. As can be seen, both recapitulate the Cosmogonic Cycle, depicted on page 6. The path marked 'Western civilization' represents the predominant way of life in today's secular society, accelerating away from Reality with every day that passes. And the small bell curve represents the traditional path of the mystics, taking a short cut to God, towards Oneness and union with the Divine, with No-mind. The middle path that unifies these extremes is one that turns evolutionary divergence into the peak of convergence, moving from the Alpha Point of evolution to its

Omega Point and back again, resting in Wholeness with what Aurobindo called 'Supermind'.

Collumination, another name for Integral Relational Logic, is the coherent system of meditative thought that enables the Coherent Light of Consciousness to reveal the holographic Universe we live in, observed with Self-reflective Intelligence, the eyesight of Consciousness, which is the Divine quality that distinguishes humans from the other animals and machines, like computers.

Since 2008, I have been seeking to make Panosophy and collumination as relevant to my contemporaries as I could make them. For I have been told that I am a prophet living far ahead of my time, a prophet being one who consciously speaks forth from the depth and breadth of her or his being, from Greek *prophētēs* 'spokesman', from *pro* 'before' and *phētēs* 'speaker', from *phēnai* 'to speak'.

As already mentioned, I have been greatly helped in this process by Joseph Campbell's popular book *The Hero with a Thousand Faces*, no doubt much read because it succinctly encapsulates the journeys so many spiritual seekers experience. Being able to see the underlying patterns and generalities in the myths and fairy tales in many cultures of the world, Campbell saw that our spiritual journeys fall into three stages consisting of seventeen steps, listed in this table.

Departure	**Initiation**	**Return**
The Call to Adventure	The Road of Trials	Refusal of the Return
Refusal of the Call	The Meeting with the Goddess	The Magic Flight
Supernatural Aid	Woman as Temptress	Rescue from Without
The Crossing of the First Threshold	Atonement with the Father	The Crossing of the Return Threshold
Belly of The Whale	Apotheosis	Master of Two Worlds
	The Ultimate Boon	Freedom to Live

In this respect, my ontogeny is no different from that of any other spiritual seeker, who has left the society in which he lives in order to find the Truth and who then seeks to return to society with the Ultimate Boon he has found at the Apotheosis of human learning, *apotheosis* deriving from Greek *apotheōsis* 'deification', from *apotheoun* 'make a god of', from *apo* 'change completely (in this context)' and *theos* 'god'. In my case, the Ultimate Boon I'm seeking to bring to the world is the Hidden Harmony. However, I've found the return to society to be by far the toughest stage of my journey. Campbell gives three reasons for the hero's predicament, saying that the responsibility of returning to the world with the adventurer's life-transmuting trophy when the hero-quest has been accomplished has been frequently refused:

1. The bliss of this experience may annihilate all recollection of, interest in, or hope for, the sorrows of the world; or else the problem of making known the way of illumination to people wrapped in economic problems may seem too great to solve.
2. The powers that he has unbalanced [on his journey to Freedom] may react so sharply that he will be blasted from within and without—crucified.
3. The hero may meet with such a blank misunderstanding and disregard from those he has come to help that his career will collapse.[117]

To resolve this dilemma, it is important to note that the above derivation of *apotheosis* arises from a misunderstanding of humanity's relationship to the Divine, which we can see most clearly in the derivation of *human*, which is Latin *humus* 'ground, earth', from the PIE base **dhghem-* 'earth'. This etymology shows that our forebears some 7,000 years ago conceived of humans as earthlings in contrast to the divine residents of the heavens, as Calvert Watkins explains in *The American Dictionary of Indo-European Roots*.[118] So the split between the human and the Divine lies deep in the collective psyche, when in Reality, there is no split, as we now need to explore.

3. The Numinosphere

I use the word *Numinosphere* to denote the Universe that we all live in, whether we know this or not. However, as the Absolute, the Numinosphere is not actually a sphere. Rather, it is a formless, borderless continuum, with no divisions or boundaries anywhere, inaccessible both to our physical senses and to our categorizing minds. So before we look at the Absolute as a sphere, it is more accurate to say that it exists even beyond the Numinosphere, whose name is explained on page 26.

Beyond the Numinosphere

How then do we know that the Ineffable Absolute exists as both Ultimate Reality and the Supreme Being? Well, throughout the ages, we humans have sensed an immanent, transcendent Presence, etymologically 'before being' or 'prior to existence', for *Presence* derives from Latin *præsentia* 'presence', participle of *præesse* 'to be before', from *præ* 'before' and *esse* 'to be'. The word *Presence* indicates that the Absolute is the Supreme Cause of Everything there is, which mystics through the ages have sought to reveal. For instance, in the fifth or sixth century, Pseudo-Dionysius the Areopagite, writing in Greek, wrote these beautiful words, which resonate deep within my being:

> Again, as we climb higher we say this. It is not soul or mind, nor does it possess imagination, conviction, speech, or understanding. Nor is it speech per se, understanding per se. It cannot be spoken of and it cannot be grasped by understanding. It is not number or order, greatness or smallness, equality or inequality, similarity or dissimilarity. It is not immovable, moving, or at rest. It has no power, it is not power, nor is it light. It does not live nor is it life. It is not a substance, nor is it eternity or time. It cannot be grasped by the understanding since it is neither knowledge nor truth. It is not kingship. It is not wisdom. It is neither one nor oneness, divinity nor goodness. Nor is it a spirit, in the sense in which we understand that term. It is not sonship or fatherhood and it is nothing known to us or to any other being. It falls neither within the predicate of nonbeing nor of being. Existing beings do not know it as it actually is and it does not know them as they are. There is no speaking of it, nor name nor knowledge of it. Darkness and light, error and truth—it is none of these. It is beyond assertion and denial. We make assertions and denials of what is next to it, but never of it, for it is both beyond every assertion, being the perfect and unique cause of all things, and, by virtue of its preeminently simple and absolute nature, free of every limitation, beyond every limitation; it is also beyond every denial.

When I read these words, and many others similar to them, I pause, as in silent meditation. For there is nothing more to say or do. This is It, the Absolute Ultimate. Paul, as a separate being, has completely disappeared, along with everybody else and the entire world of form, including the physical universe. There is thus no 'I' to ask "Who am I?" In *jñāna-yoga*, the path of wisdom and abstract knowledge in Advaita, this question is answered by the incantation *neti neti* 'not this, not this'.

This approach to finding God, cutting through the entire world of form, is called *via negativa* in Christianity or, influenced by the Neoplatonist Plotinus, apophatic theology, from Greek *apophatikos* 'negative', from *apophasis* 'denial', from *apo-* 'other than' and *phanai* 'to speak'.

We have thus been led to the Truth, which sets us free, as Jesus famously said.[119] Similarly, "Truth is a Pathless Land," as J. Krishnamurti said in 1929, when dissolving the Order of the Star, the theosophical organization that wanted to make him a world teacher. As he said at the time, "Truth, being limitless,

unconditioned, unapproachable by any path whatsoever, cannot be organized; nor should any organization be formed to lead or to coerce people along a particular path."[120]

It might thus appear that I have found the Cosmic Context and Gnostic Foundation for all our learning, which I realized I needed as a seven-year-old to determine the truth or otherwise of what my teachers were telling me about God, the Universe, and the world I live in. However, this statement is the wrong way round. It is uttered from an egoic, anthropocentric perspective, thinking that Paul, as an individual, and humanity, as a species, are special. We are not. The fundamental laws of the Universe apply to us all, just like any other beings in the relativistic world of form.

For myself, the only way that I can understand my own ontogeny, outlined in the previous chapter, and human phylogeny, outlined in Chapter 7 'The Singularity in Time', is to stand outside the entire world of form with what I call a Holoramic 'Whole-seeing' perspective, from Greek *ὁlos* 'whole' and *ὁrāma* 'sight, view', cognate with *panoramic* 'all-seeing'. Then I can see that I am a Divine being having a human experience, rather than a human being having a blissful, Divine experience, sometimes dangerously ecstatic.

Nevertheless, in terms of human experience, we are now living in Paradise, called *Nirvāna* 'extinction' in the East. But as this is completely without form and structure, the picture that mystics can see is not like a painting, like this one of *Paradise*, by Jan Brueghel the Younger, in which humans are conspicuous by their absence. Rather, it is like that on the right, like a blank canvas, not even with any borders. For in Reality, there is nothing there and yet everything is there. Nothing is born or dies in Paradise; it is the Immortal Ground of Being that we all share.

It might appear absurd to try to talk about Ineffable, Nondual Wholeness with words, a challenge that mystics through the ages have faced. For instance, the opening words of Laozi's *Tao Te Ching* are, "Tao can be talked about, But not the Eternal Tao. Names can be named, But not the Eternal Name."[121] Similarly, Thich Nhat Hanh tells us that Shakyamuni Buddha (sage of the tribe of Shakya) said to Ananda, his most devoted disciple, "Ananda, the teaching on the emptiness of self is meant to guide our meditation. It is not to be taken as a doctrine. If people take it as a doctrine, they will become entangled by it. I have often said that the teaching should be considered as a raft used to cross to the other shore or a finger pointing to the moon. We should not become caught up in the teaching."[122]

Nevertheless, the Absolute, as the Supreme Cause of everything, is constantly creating new structures in the relativistic world of form. There is nothing any of us can do to prevent this. All we can actually do is express our gratitude for the wonderful gifts that we have been given, not claiming them for our own, as in the intellectual property laws governing copyrights, patents, and trade marks. For instance, the Internet belongs to us all, not to any particular nation or company, reflecting that none of us is separate from any other. This is another great gift we have been given. For until the invention of the Internet, no system of thought has enabled us to make cognitive sense of the Divine, which can only be fully experienced when the sense of the experiencer as a separate being disappears. So let us see how the Internet could help us build a brand-new Universe, soundly based on the Truth.

Birth of the Universe

To do this, we use the opposite approach to *via negativa*, called *via positiva* in Christianity. For in a world in which opposites are never separate, not surprisingly human beings have been led to find God by studying the effects of the Divine, rather than the Absolute, itself. This is also called the affirmative way or kataphatic theology, from Greek *kataphatikos* 'affirmative', from *kataphasis* 'affirmation', from *kata-* (as an intensifier) and *phanai* 'to speak'. The affirmative way is an "approach to God that affirms that something can be discerned of his being and nature through reason and from the created order," a method that Thomas Aquinas used to demonstrate the existence of God.[123] We can thus see that *via negativa* and *via positiva* correspond to the small and large bell curves in the ontogenetic diagram on page 22; one is involutionary and the other evolutionary, both leading to Nonmanifest Reality.

As the apophatic path leads us away from the relativistic world of form, containing words and concepts, we need the kataphatic path to explain why the Numinosphere is so named. We begin by giving the Formless Absolute a little structure. There is some danger here, for we live in a bifurcating Universe, as the systems philosopher Ervin Laszlo has pointed out.[124] This has led to our minds and psyches becoming fragmented and split, apparently separate from Reality, a critical issue we look at a little further in the chapter on the noosphere on page 42. So as we leave Reality through any analytical activity, we need to constantly remind ourselves that we never actually leave Home, as Paradise. When we feel that we have done so by living in the dual and dualistic world of everyday affairs, it is vitally important to come back to Reality as soon as possible, sensing Stillness, Peace, and Love, three of the principal characteristics of the Divine, as we humans experience it.

As we set out to create a coherent view of the Universe that corresponds to all our experiences, from the mystical to the mundane, the first bifurcation we can give to Nondual Reality, guided by the Hidden Harmony, is to distinguish Wholeness and Oneness, the terminating points of the two ontogenetic paths in the diagram on page 22. This is why the Numinosphere is so named. I visualize it as an infinitely dimensional hypersphere with an infinite radius, from Greek *ὑper* 'over, beyond'. The entire body and volume of the hypersphere is Wholeness, embracing its Centre, as Oneness.

We can see something like this distinction between Absolute Oneness and Wholeness in Buddhist teachings. Oneness corresponds to *Shūnyatā* 'Emptiness, Void', which Siddhartha Gautama experienced when sitting quietly under the famous Bodhi tree. From this arose the notion of *Arhat* 'worthy one', the designation of someone who has become fully enlightened in what became known as the *Hinayāna* or 'Small Vehicle' school of Buddhism. In Hinduism, such an awakened being is called a *Sādhu*, from Sanskrit *sadh* 'to lead to fulfilment', having reached *Sādhana*, from *sādh* 'to arrive at the goal'.

However, Buddhists in the first century CE realized that such a hermitic approach was not sufficient for the whole of society to be enlightened. They therefore formed the *Mahāyāna* 'Great Vehicle' school, whose central notion is *Tathatā*, usually translated 'Suchness', from *tathā* 'in that manner, so', the true nature of all beings, being immutable and immovable, beyond all concepts and distinctions. *Tathatā* clearly corresponds to Wholeness in the cosmology of cosmologies described in this book. In social terms, this means that no individual can become fully enlightened until all beings are, a principle encapsulated in the notion of *Boddhisattva* 'enlightenment being', providing active help to relieve the suffering of all other beings.[125]

Similarly, the Christian Bible begins with these words in the Jewish Torah: "In the beginning God created the heaven and earth. And the earth was without form, and void; and the darkness was upon the face of the deep. And the Spirit of God moved upon the face of the waters." And nine verses from the

end is this verse: "I am Alpha and Omega, the beginning and the end, the first and the last."[126] This sentence is usually attributed to Jesus, the Christ, depicted in the ubiquitous *chi-rho* symbol drawn by early Christians. But it was not only Jesus who had Christ Consciousness, which is no different from Buddha Consciousness. As none of us is ever separate from the Divine for an instant, we are all both Alpha and Omega.

As we all live in exactly the same Universe governed by the same Cosmic laws, there is nothing new here. Many before me have described the birth-and-death process that we all go through in the most beautiful, poetic language. Here are a couple of examples, the first from the *Taittiriya Upanishad* and the second from 'Little Gidding', the final poem in T. S. Eliot's *Four Quartets*: [127]

Bhrigu meditated and found that bliss is Brahman.
From bliss are born all creatures,
By bliss they grow,
And to bliss they return when they depart.

We shall not cease from exploration
And the end of all our exploring
Will be to arrive where we started
And know the place for the first time.

Coherent Light of Consciousness

However, visualizing the Numinosphere in this transfinite manner is not so easy to relate to as we live our daily lives very much in the finite. So to approach our day-to-day practicalities, the next step I take is to view the Universe as a three-dimensional ball of water with a finite radius, depicting the Ocean of Consciousness, which authors like Romain Rolland[128] and Stanislav Grof[129] have talked about in their writings. We have now given the Numinosphere a surface, which is the tiny part of the Universe accessible to our five physical senses. Beneath the surface is the Cosmic Psyche, the last frontier of human discovery, by far the most interesting part. However, it is still little explored and understood because of our cultural conditioning and because it is inaccessible to these senses. If we are mainly concerned with the material world, we live very superficial lives, not fully understanding why we behave as we do.

From this perspective, the Numinosphere is a three-dimensional generalization of David Bohm's one-dimensional holomovement, with which he unified the incompatibilities of quantum and relativity theories, described in Section 'The other major reason why I abandoned physics at university was that I did not believe in the big bang theory as the origin of the universe, somewhere backwards in finite time. As a teenager in the 1950s, I favoured Fred Hoyle's steady-state model of the Cosmos purely on the grounds that it was more elegant. Indeed, it is rather strange that what Hoyle disparagingly called a 'big bang' in a famous radio broadcast on the BBC on 29th March 1948, should have become entrenched as scientific dogma.

For in Edwin Hubble's landmark 1929 paper, in which he announced the discovery of twenty-two galaxies beyond the Milky Way, five are converging on themselves while the other seventeen are moving away from each other. For instance, Hubble discovered that the Andromeda galaxy, the nearest to us, is moving towards the Milky Way at 70 kms/sec or 252,000 kms/hour. As Brian Cox tells us, one day soon (in three to five billion years), the Andromeda and Milky Way galaxies will collide.

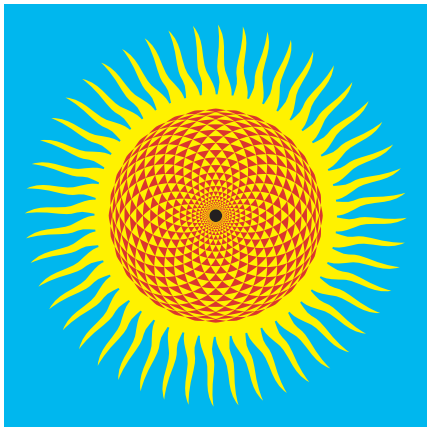
Nevertheless, despite my scepticism about the way scientific studies were being conducted in the 1950s, I still had faith that one day we humans would discover how the Universe is designed through the resolute power of reason. So at the age of sixteen, recognizing that scientific analysis can never end, I

asked myself the question, "What can we know about the Universe that is beyond the frontiers of science at any one time?"

Unifying quantum and relativity theories' on page 106. Inspired by the process thinking of Heraclitus and Alfred North Whitehead, Bohm reconciled these incompatibilities by recognizing the existence of a continuous power underlying the surface of the material universe, which he likened to a flowing stream, called the holomovement, whose substance is never the same. As he said, "On this stream, one may see an ever-changing pattern of vortices, ripples, waves, splashes, etc., which evidently have no independent existence as such. Rather, they are abstracted from the flowing movement, arising and vanishing in the total process of the flow."[130]

In the words of Kabbalah—the mystical core of Judaism—there is a curtain that divides our reality into two realms, 1% being our physical world, while the other 99% "is the source of all lasting fulfilment. All knowledge, wisdom, and joy dwell in this realm. This is the domain that Kabbalists call *Light*."[131]

So the other metaphor we can use for Consciousness, as Ultimate Reality, is Light, for as the ecophilosopher Henryk Skolimowski points out, "*Everything is Light*," and "Light is universal and all pervading. It provides the womb, sustenance, and nourishment for all there is. It is the Universal Mother."[132] But Light is not like the diffuse light of the Sun or a light bulb. Rather, it is more like the coherent light of a laser, enabling us to view the Cosmos holographically, like a fractal, possessing the property of self-similarity in all its constituents.



As this diagram illustrates, the Coherent Light of Consciousness radiates directly from the black hole at the centre of the Ocean of Consciousness. This is the Origin of the Universe, the Divine Source of Life, giving rise to all forms in the manifest universe. But it is important to note that this black hole is not a region of space-time cut off from the rest of the universe, as Stephen Hawking and Leonard Mlodinow define in *The Grand Design*.[133] What physicists study is not the Universe, as we look at further in the chapter on the hylosphere on page 103.

Now, as mentioned on page 3, Teilhard called the Ultimate Sphere *Le Milieu Divin*. When this book was eventually published in English in 1960, Bernard Wall, the general editor of Teilhard's English *Collected Works*, wrote that the title of *Le Milieu Divin* was left untranslated because "The word *milieu* has no exact equivalent in English as it implies both centre and environment or setting."[134] This is a vitally important point that we can see from the root of *milieu*, which is from Old French *milieu* 'centre', from *mi-* 'middle', from Latin *medius* 'mid', and *lieu* 'centre, circle, heart, place, sphere', from Latin *locus* 'place'. So *milieu* in French does not just mean 'environment', such as atmosphere, as in English. For a sphere has a surface, volume, *and* centre.

We are thus beginning to see that the Numinosphere is not just the Absolute Whole, as a Formless Continuum. It contains the entire relativistic world of form within it. And like the waves and currents on and within an ocean, none of these beings is separate from the Absolute, and hence any other being, for an instant. This naturally includes us human beings, contradicting the most fundamental belief of the Abrahamic religions: God is other, the first pillar of unwisdom that underlies Western civilization.

Pillars of wisdom and unwisdom

This belief that we humans are separate from God, Nature, and each other has led the culture I was born in to be built on seven pillars of unwisdom, a term introduced by Arthur Koestler in *The Ghost in the Machine* to highlight the absurdities and limitations of the biological, behavioural, mechanistic, and quantitative sciences.[135] These pillars are misconceptions of God, Universe, Life, humanity, money, justice, and reason. It is thus vitally important that we demolish these seven pillars, rebuilding the entire world of learning on seven pillars of wisdom, briefly given in this table:

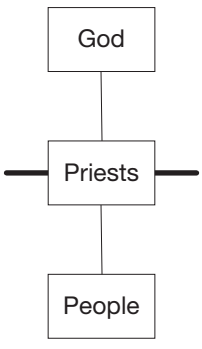
No.	Pillars of unwisdom	Pillars of wisdom
1	God is other	Humans are Divine beings
2	The Universe is the physical universe	The Universe is Consciousness
3	Life is a property of the DNA molecule	Life arises from our Divine Source like a fountain
4	Humans are machines and nothing but machines	Humans are creative beings living in the Eternal Now
5	Financial modelling methods	Sustainable business requires meaningful information
6	Individuals have the free will to act independently	There is no doership or ownership
7	Only either-or reasoning is valid	Both-and thinking is the Hidden Harmony

By starting afresh at the very beginning, at the Divine Origin of the Universe, we realize that at the very beginning is the Numinosphere, the Contextual Foundation for all our lives, embracing and supporting the other three spheres constituting the Universe. For like everything else, there are two ways of viewing the four spheres. From a contextual perspective, the Absolute contains the Numinosphere, noosphere, biosphere, and hylosphere in turn, viewing each of these spheres as volumes. However, from the perspective of the centre of the Numinosphere, this gives rise to the Cosmic Psyche, as the noosphere, from which are built the biosphere and hylosphere on the surface of the Numinosphere, viewed with a finite radius.

Of course, none of these spheres exist in Reality. They are only useful as maps to guide us in the practicalities of our daily lives. For everything that we conceive in the relativistic world of form is an abstraction from Consciousness, called *māyā* 'deception, illusion, appearance', probably from Sanskrit *mā* 'to measure', cognate with *measure*, *month*, and *dimension*. In another Sanskrit word, the entire manifest world is *līlā*, the delightful play of the Divine.

So the idea that God is personal makes no sense from the perspective of the Numinosphere. Neither do we need to fight holy wars—wars about the Whole. For once we realize that we all live in the same Universe with exactly the same God, all conflicts and suffering would disappear and we could collectively cocreate World Peace—with the help of the Divine, of course.

Such holy wars arise principally because the three Abrahamic religions of Judaism, Christianity, and Islam all believe that their particular view of a separate God is exclusively the only true one, to be defended at all costs, even to death. As F. C. Happold tells us, "To Jew, Christian, and Moslem, a gulf is felt to exist between God and man, Creator and created, which can never be crossed. To assert that 'Thou' art 'That' [as Vedanta Hindus do] sounds blasphemous".[136] And as Elaine Pagels points out, "Even the mystics of Jewish and Christian tradition who seek to find their identity in God often are careful to acknowledge the abyss that separates them from their divine Source."[137]



Accordingly, rabbis, priests, and imams have long done their best to come between the people and God, claiming that they alone know the 'word of God'. They often wear distinctive clothes and are given special titles by their devotees, in order to make themselves special, separate from the populace as a whole. In illustration, Yehuda Berg

tells us that the Zohar, the primary Kabbalistic text, "warned that the 'governing religious authority' would always try to prevent the people from claiming the spiritual power that was rightly theirs." Such authorities would "act as an intermediary between man and the divine". For if they allowed people to "connect directly to the infinite, boundless Light of Creation" that "would mean their demise as gatekeepers to heaven".[138]

Nevertheless, some progress is being made in healing this deep split today. As the Benedictine monk David Steindl-Rast has said, one of his great concerns is that the Western God-view is warped and makes us sick. The idea of God as being separate from us is an extremely dangerous view.[139] And as the Jungian therapist Anne Baring wisely wrote in her lyrical magnum opus in 2013, we urgently need a new image of God, different from that which we have inherited from the patriarchal religions, which portray a transcendent God creating the world from a distance, separate from the created world and ourselves.[140]

When this deep split is healed in the collective psyche, we shall thereby fulfil the prophesy made in 1901 by the Canadian psychiatrist Richard Maurice Bucke in *Cosmic Consciousness*: "our descendants will sooner or later reach, as a race, the condition of cosmic consciousness. … In contact with the flux of cosmic consciousness all religions known and named to-day will be melted down. The human soul will be revolutionized." And when this happens, "Churches, priests, forms, creeds, prayers, all agents, all intermediaries between the individual man and God will be permanently replaced by direct unmistakeable intercourse. Sin will no longer exist nor will salvation be desired. Men will not worry about death or a future, about the kingdom of heaven, about what may come with and after the cessation of the present body. Each soul will feel itself to be immortal,"[141] extraordinary words written many years ahead of their time.

The theistic origin of money

But how are we to interpret all the gods and goddesses that various cultures have been moved to invent through the ages? Well, as the concepts we form are based mainly on human experience, deities must have appeared from the multitude of different ways we have experienced the power of the Divine over the years. At first, our forebears associated deities with the energies that they saw around them, most notably the Sun, like the Egyptian god Horus, the son of Osiris and Isis, and the Ādityas in the Hindu *Vedas*, whose mother was Aditī, the feminine form of *Aditi* 'unlimited space, eternity, infinite consciousness'.

This was the beginning of the humanization of the gods and goddesses, even creating family trees for them, showing their relationships to each other. However, as Mircea Eliade points out, hierogamy is absent in the archaic religions, "their supreme Beings were androgyne, at once male and female, both Heavenly and Earthly. … Androgyny is an archaic and universal formula for the expression of *wholeness*, the co-existence of the contraries, or *coincidentia oppositorum*,"[142] in the terms of Nicholas of Cusa. Indeed, Eliade calls *coincidentia oppositorum* the 'mythical pattern', "the very nature of the divinity".[143]

The Divine energy patterns that people could feel within them have been projected on to gods and goddesses with many different names in various cultures over the years. For instance, the three major energy patterns in the world of creation, destruction, and maintenance are called *Brahma*, *Shiva*, and *Vishnu* in the *Vedas* 'knowledge', cognate with *wise*. Surprisingly, the Islamic *Koran* (*Qur'an*) also names these three types of energy as *Al-Khaliq* 'Creator', *Al-Mumit* 'Destroyer', and *Al-Hafiz* 'Preserver', three of the ninety-nine beautiful names of God. So while Islam and Hinduism are regarded as monotheistic and polytheistic, respectively, they are both actually both.

How ordinary householders related to the gods and goddesses, in contrast to the Rishis who wrote the *Upanishads*, is encapsulated and typified in just four verses in the thirtieth hymn of Book 8 in *Rig Veda*, the *Veda* of poetry:

1. Not one of you, gods, is small, not one a little child; all of you are truly great.
2. Therefore you are worthy of praise and of sacrifice, you thirty-three gods of Manu, arrogant and powerful.
3. Protect us, help us and speak for us; do not lead us into the distance far away from our father Manu [eponymous ancestor of mankind].
4. You gods who are all here and who belong to all men, give far-reaching shelter to us and our cows and horses.[144]

The word *sacrifice* here derives from Latin *sacrificium* 'sacrifice', from *sacrāre* 'to dedicate to a god, make holy', from *sacer* 'sacred, holy', from PIE base **sak-* 'to sanctify', also root of *saint* and *sanctuary*, and *facere* 'to make'. So to sacrifice literally means 'to make Whole', through the union of opposites, leading to a healthy way of living and being.

For the word *health* derives from an Old High German word *heilida*, which is cognate with *heil* 'whole' and *heilag* 'holy', from PIE base *kailo-* 'whole, uninjured, of good omen'. In contrast, evolution's tendency to form wholes of ever-increasing complexity, which Jan Christiaan Smuts called *holism*, derives from Greek *ὁlos* 'whole, with a PIE base **sol-* 'whole', also root of *safe*, *salubrious*, *solid*, *catholic* 'relating to the Whole', and *saviour*. It seems that it is just a happy coincidence that the PIE bases for *holy* and *holistic* should be different.

However, in the early days of human phylogeny, very few people understood that it is not necessary to make sacrifices to the gods, believing that they were separate from the Divine and their fellow humans. So as Henri Hubert and Marcel Mauss tell us in *Sacrifice: Its Nature and Function*, published in *Année Sociologue* in 1898, our distant ancestors worshipped, prayed to, and made sacrifices to a multitude of gods and goddesses to assuage the fears that arise from separation.[145] These fears eventually gave birth to the organized religions and modern economics in the forms of capitalism and communism.

For as Marcel Mauss tells us in 1925 in *The Gift*, as a development of his essay *Sacrifice*, Sanskrit *dadāmi se, dehi me* 'I give you in return, as you give me' in the *Yajurveda* 'the Veda of sacrificial texts' indicates the way that sacrificial gifts to deities led to gift economies in what he called 'archaic' societies.[146] Similarly, the Latin formula *do ut des* 'I give so that you may give' in Roman religion and law expresses the reciprocity of exchange between humans and deities, where people are obliged to make sacrifices, with the expectation that they will receive something in return, then extended into gifts between individuals and groups, as Jörg Rüpke tells us in *Religion of the Romans*.[147]

As the analytical, categorizing mind led people to feel increasingly separate from the Absolute and each other, they invented money to facilitate trade. *Money* derives from Latin *Moneta*, an epithet for Juno, a Roman goddess equivalent to Greek Hera, sister and wife of Zeus, in whose temple money was coined, hence, a mint. As the deeply questioning anthropologist A. M. Hocart wrote in his essay on 'Money', this led to the formation of gold coins, with heads of sovereigns stamped on them as representatives of the gods, the shining gold corresponding to the sun worshipped as a deity.[148]

For *deity* derives from Latin *deus* 'god', from the PIE root **dyeu* 'to shine', also the root of *Divine*. So Zeus was the greatest god in the Greek pantheon, as the son of Light, corresponding to Jupiter in the Roman pantheon, who gave his name to July, when the Sun is at its brightest in Europe, the root of *jovial* 'cheerful, happy, friendly'.

Humanity's separation from Divinity—as our Immortal Ground of Being—has led to the existential fears that sub- and unconsciously drive human affairs today. To assuage our fears of death, people created immortality symbols. As Ernest Becker, the Pulitzer prize-winning author of *The Denial of Death*, shows

in *Escape from Evil*, we have used our cultures for this purpose throughout history.[149] For cultures have longer lifespans than those of our bodies. So they have provided immortality systems and symbols to give people a sense of security and identity in life, albeit rather precarious, for such symbols are based on delusion, on a false sense of Reality.

Money and religion are closely intertwined in providing cultural immortality symbols. Specifically, Becker explored the role of money as "The New Universal Immortality Ideology", referencing Norman O. Brown's *Life Against Death*: "the reason money is so elusive to our understanding is that it is *still sacred*, still a magical object on which we rely for our entrance to immortality."[150] And quoting Mary Douglas "Money is only an extreme and specialized type of ritual."[151] Ritualistic immortality symbols have taken many forms over the years. As Becker put it, also quoted by Ken Wilber in *Up From Eden*:[152]

> And so the pursuit of money was also opened up in the average man, gold became the new immortality symbol. In the temple buildings, palaces, monuments of the new cities, we see a new kind of power being generated. No longer the power of totemic communion, but the power of testimonial of piles of stones and gold.[153]

We can see quite clearly that money is an immortality symbol from the tower blocks that banks build in the centre of major cities today. As James Robertson, cofounder in the mid 1980s of the New Economics Foundation (NEF) and The Other Economic Summit (TOES), points out in *Future Work*, these buildings play a similar role in society today to the cathedrals that dominated the centres of medieval cities. Both serve to reinforce our belief in immortality symbols; in the Middle Ages, the notion of a personal God, and today, money. As James goes on to say, "The theologians of the late middle ages have their counterpart in the economists of the late industrial age. Financial mumbo-jumbo holds us in thrall today, as religious mumbo-jumbo held our ancestors then."[154]

We can see the close association between financial and religious immortality symbols from the letters F D or FID DEF, embossed on British coins near the Queen's head. For these initials and abbreviations stand for *fidei defensor* meaning that Queen Elizabeth II is Defender of the Faith, a title originally given by Pope Leo X to King Henry VIII in 1521. Subsequently, this Tudor king split from Rome and the title was revoked. However, in 1544, the English parliament conferred the title 'Defender of Faith' on King Edward VI and his successors as the head of the Church of England.[155] To this day, no Roman Catholic is allowed to succeed to the British throne; the monarchs of the United Kingdom of Great Britain and Northern Ireland are specifically charged with defending the Anglican faith alone, an anomalous situation in today's multicultural society, which the Prince of Wales is particularly concerned about.

In a similar fashion, the words *In God We Trust*, the motto of the United States of America, has appeared on American coins since 1864 and on banknotes since 1957.[156] This motto seems to have come from America's national anthem, *The Star-Spangled Banner*, which contains these two lines: "Then conquer we must, when our cause it is just, /And this be our motto—"In God is our trust."[157] This poem, written by Francis Scott Key, was inspired by an American victory over the British in 1814. So capitalism is closely associated with the notion that Americans are God's chosen people and that God is on the side of nations when they go to war, often expressed in these words: "God bless America."

As another example, Ralph Metzner says in *The Roots of War and Domination*, "capitalism … is an institutionalized system of slavery and predation,"[158] closely related to the war system, for as a satirical report from 1967 indicated, if we ever lived in love and peace with each other, the global economy would collapse![159] This supposedly 'secret government report', called *Report from Iron Mountain: On the Possibility & Desirability of Peace*, turned out to be hoax, investigating the dire consequences of 'permanent peace' on the United States' economic and social stability. Nevertheless, many a truth is spoken in jest, such as this

concluding sentiment from the report: "War … is itself the principal basis of organization on which all modern societies are constructed."[160]

Revealing Inner Peace

One other obvious consequence of humanity's separation from the Immortal Absolute, where Love and Peace are to be found, is that human beings have been ferociously fighting each other over the years, particularly during the patriarchal epoch, when the analytical mind became the dominant thrust of evolutionary development.

For instance, Anthony Storr points out in *Human Aggression*: "With the exception of certain rodents, no other vertebrate habitually destroys members of its own species. No other animal takes positive pleasure in the exercise of cruelty upon another of his own kind … The sombre fact is that we are the cruellest and most ruthless species that has ever walked the earth."

In a similar fashion, Erich Fromm quotes these words of Nikolaas Tinbergen in *The Anatomy of Human Destructiveness*: "On the one hand, man is akin to many species of animals in that he fights his own species. But on the other hand, he is, among the thousands of species that fight, the only one in which fighting is disruptive … Man is the only species that is a mass murderer, the only misfit in his own society."

This, in brief, is the cultural context in which depth psychologists, such as Carl Gustav Jung, Roberto Assagioli, Erich Fromm, Abraham Maslow, and Stanislav Grof, building on the pioneering studies of Sigmund Freud, have attempted to map the Cosmic Psyche during the twentieth century. Despite the cultural constraints, much progress has been made in understanding the energies in the depths of the human psyche that govern our business affairs today. However, their work is not generally understood by scientists and the population at large and is rarely included within conventional academic psychology courses, as I understand the situation.

Nevertheless, more and more people have some intuitive understanding of the *Weltanschauung* described in this book, using the German word rather than the English *worldview*. For *Weltanschauung* is derived from *Welt* 'world' and *Anschauung* 'view', from Middle High German *anschouwunge* 'observation, mystical contemplation'. So *Weltanschauung* has a deeper meaning than *worldview*, indicating both scientific observation and spiritual meditation. It is through such a *Weltanschauung* that we can develop a comprehensive model of the psychodynamics of the whole of society, helping us to understand why we all behave in the way that we do. It is this to which we must now turn our attention.

4. The Noosphere

The noosphere is where we humans use Self-reflective Intelligence to form mental maps of the world we live in, a skill that is unique to *Homo sapiens*. For we humans are the least instinctive of all the animals, as the social psychologist Erich Fromm has pointed out.[161] Using the metaphor of a computer, very few of our thoughts and actions are hard-wired. The innate instincts and automatic reflexes of babies to suck, grasp, cry, and respond to stimuli mostly disappear within the first few months of life.[162] Our learning—corresponding to software and data in computers—mostly determines the way that we view the world and ourselves, and hence our behaviour. Our minds, stimulated by the Divine Power of Life, determine how we think and act, far more than our brains.

It is thus of the utmost importance that our maps provide us with a true representation of the Universe. Otherwise, we could be led dangerously astray, crashing into rocks in stormy seas, like sailors circumnavigating the globe before John Harrison built a reliable chronometer, inspired by the Longitude Act of 1814 in the UK. Harrison, working almost entirely on his own, created a reliable watch that would keep time on a rolling ship well within the accuracy of two minutes on a long voyage, as required by the act, to annoyance of the powers that be.[163]

Today, with scientists and technologists driving the pace of evolutionary development at exponential rates of change, it is even more important that we learn how to navigate both on and within the Ocean of Consciousness. Not only this. We need to understand our position in the overall scheme of things, answering such questions as where have we come from and where are we heading? This still hasn't happened in a manner that is acceptable to most scientists, for as Stephen W. Hawking said in *A Brief History of Time*, perhaps with tongue in cheek, "we have, as yet, had little success in predicting human behaviour from mathematical equations!"[164]

Mapping the mind

The challenge facing us in developing a comprehensive science of mind and consciousness became crystal clear in the 1980s, when Apple introduced the desktop metaphor on its Macintosh computers, later mimicked in Microsoft's Windows, IBM's OS/2, and Unix's X Window System. For while Information Systems architects had long needed to understand how the mind works in order to automate as many jobs as possible, with the introduction of graphical user interfaces, it became necessary for software developers to have a similar understanding. For instance, this is how IBM introduced its guidelines for human interface designers of its OS/2 operating system in 1992:

> The term model is used in this book to refer to a descriptive representation of a person's conceptual and operational understanding of something. Some models are explicit and are consciously designed. These models typically can be represented by a diagram or a textual description. Other models, called mental models, are developed unconsciously. People create a mental model by putting together sets of perceived rules and patterns in a way that explains a situation.

> A typical person cannot draw or describe his or her mental model. In many situations, a person is not aware that a mental model exists.[165]

Now, even though most people are unaware of the mental models that guide their behaviour, clearly designers of information systems to be used by human beings need to be aware of these implicit mental models. For as the IBM manual said, "A person develops a conceptual model through experience and then develops expectations based on relationships in the model," a conceptual model being a mental map that consists of "the set of relationships that a person perceives to exist among elements of any situation".[166]

In a similar manner, Apple's *Human Interface Guidelines* in 1987 urged designers to "use concrete metaphors [from the 'real world'] and make them plain, so that users have a set of expectations to apply to computer environments".[167] But Apple went a little further than IBM about people's lack of understanding and consciousness about the conceptual models they use when it said: "People, however, are delightfully complex and varied, which assures that a theory of human activity that would provide a complete framework for the design of human-computer interaction is a long way off".[168]

Not having a model of the workings of the mind obviously also makes the IS architect's job rather difficult. Nevertheless, this has not prevented many from creating models of the way businesses are run. For instance, the birth of the digital computer led Jay W. Forrester at MIT to develop a number of complex computer models in the 1960s and early 70s of the dynamics of business organizations, of urban areas, and even of society as a whole,[169] which led to the publication of *The Limits to Growth: A Report for the Club of Rome's Project on the Predicament of Mankind*.[170] As Forrester said:

> There is nothing new in the use of models to represent social systems. Everyone used models all the time. Every person in his private life and in his community life uses models for decision making. The mental image of the world around one, carried in each individual's head, is a model. One does not have a family, a business, a city, a government, or a country in his head. He has only selected concepts and relationships which he uses to represent the real system. A mental image is a model. All our decisions are taken on the basis of models. All of our laws are passed on the basis of models. All executive actions are taken on the basis of models. The question is not whether to use or ignore models. The question is only a choice between alternative models.[171]

Forrester was a great advocate of computer models of social dynamics because, as oversimplified as they are, they are "probably more complete and explicit than the mental models now being used as a basis for world and national planning".[172] He even went as far as presenting his view that mental models are dangerous to members of the U.S. Congress in 1970, with these words:

> … the human mind is not adapted to interpreting how social systems behave. … until recently there has been no way to estimate the behavior of social systems except by contemplation, discussion, argument, and guesswork.
>
> The great uncertainty with mental models is the inability to anticipate consequences of interactions between parts of the system. This uncertainty is totally eliminated in computer models. Given a stated set of assumptions, the computer traces the resulting consequences without doubt or error. … Furthermore, any concept or relationship that can be clearly stated in ordinary language can be translated into computer model language.[173]

Joseph Weizenbaum, also of MIT, was particularly critical of such statements by what he derisively called the 'artificial intelligentsia'. As he said, "Consider the impact of Forrester's words on the members of the U.S. Congress … or on any other group of people who have no training in or intuition for formal systems. They hear that the basis of their thinking, mental models, leads to uncertainty, whereas Forrester-like computer models totally eliminate this uncertainty and all doubt or error. … Conclusions derived from computer models are valid beyond doubt."[174] Of course, Forrester omitted to say that his opinions can only be true if the starting assumptions and algorithms that connect the many variables are valid representations of what he, like many others, call 'reality'.

Concept formation

We can consider human-computer interactions to take place on the surface of the noosphere. Designers of computer systems need to have conceptual models of the systems that they are developing for them to function in as 'user-friendly' a manner as possible, a term that became familiar in the early 1980s, as personal computers began to spread in the marketplace. But what about human-human interactions? Could we use the skills of software developers and information systems architects to ensure that our conversations with each other are conducted in as friendly a manner as possible?

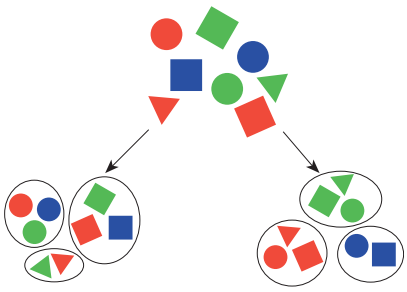
Well, to do so, we need to dive beneath the surface of the noosphere, to its very centre, which, of course, is also the Centre of the concentric Numinosphere, the Divine Source of Life. But what can we call the Centre of the Universe from the perspective of our minds? Well, there is a convenient Latin word that we can use for this purpose. The Centre of the Cosmos is the *Datum*, Latin for 'that which is given', from *dare* 'to offer, give', from PIE base *dō* 'to give', also root of *donor*. So everything that exists in the world of form, including our bodies, minds, and souls, is a gift of the Datum, as the Divine.

Coincidentally, Latin *dare* could also mean 'to cause', from PIE base **dhē-* 'to set, put', also root of *do*, through a Germanic path, and a host of words from Latin *facere* 'to do, make', such as *affect*, *efficient*, and *faculty*. So the Datum of the Universe is the Absolute, the Supreme Cause of everything that exists in the manifest world of form.

These forms first emerge from the Datum as data elements, forming patterns, the most basic concept in the data-processing industry. Now it is vitally important to note that both data patterns and the Datum from which they arise are utterly meaningless. In the information technology industry, *information is data with meaning*, data being what exists prior to interpretation by an intelligent being. Although this is not universal, in the DP industry *data* is often used as an uncountable noun, more like sand than pebbles, the plural of *datum*. *Information*, on the other hand, derives from the Latin *informāre* 'to give form and shape to, form an idea of'. So information is morphogenetic, from Greek *morphē* 'form, shape', as some biologists, such as Rupert Sheldrake[175] and Armand Leroi,[176] are beginning to see today.

This difference between data and information may not be familiar to everybody. However, even our children are being taught to make this distinction. At the end of the twentieth century, my sixteen-year-old niece took a two-year course in information technology for nonprogrammers in which her textbook gave these definitions for *data* and *information*:

> **Data** may consist of recorded facts, events or transactions.
> **Information** is data that has been processed into a form that is useful, or data that has been given a meaning by putting it into context.[177]



Interpreting meaningless data as meaningful information and knowledge within the Cosmic Context of the meaningless Datum is simplicity itself. Applying David Bohm's method for bringing universal order to our thoughts, mentioned on page 18, we put patterns into various sets according to the similarities and difference we perceive. For instance, as children, when we began to form concepts, we learned to distinguish colours, shapes, and numbers, as in this illustration. This transcultural, transdisciplinary interpretative process is central to pattern recognition, conscious evolution, and all our learning. As the authors of *The 'New' Maths* pointed out, the new maths was intended to bring meaning to mathematics and hence to all other disciplines.[178]

Mathematics is thus the science of patterns and relationships, evolving from the science of space and number, as the ancient Greeks understood what Carl Friedrich Gauss called the 'queen of the sciences'.[179] George Boole, a most highly valued kindred spirit, helped free mathematics from the tyranny of number systems, regarding the essence of mathematics as "the study of form and structure rather than content, and that 'pure mathematics' is concerned with the laws of combination of 'operators' in their widest sense." For instance, he noted that the commutative and distributive laws of arithmetic could equally apply to differential operators and geometric transformations.[180]

Accordingly, drawing on Duncan F. Gregory's generalizing principles, in 1844, Boole wrote a paper titled 'On a General Method in Analysis' published in the *Philosophical Transactions of the Royal Society of London*,[181] for which Boole was awarded the Royal Society's first gold medal for mathematics, known as the Royal Medal. By thus gaining a reputation as one of the leading mathematicians of his day, Boole applied for and was appointed the first professor of mathematics at Queen's College in Cork in 1849, even though he did not have a degree.[182]

Boole's publications and those of his successors led mathematicians to see at the end of the nineteenth century that it is not possible to form the concept of three until the concept of set is formed. We can thus see that semantics, as the science of meaning underlying all the sciences and humanities, is more significant than mathematics.

But this is a quite different view of mathematics and science from that which prevails today. As an information systems architect by profession, I view the business world, and hence the Universe, in terms of **structure**, **form**, **relationship**, and **meaning**, rather than the mass, space, and time of physicists and the earth, air, fire, and water of the ancients.

To clarify this point, in 1940, the mathematical analyst G. H. Hardy felt that he needed to make an apology for his occupation, saying, "I have never done anything 'useful'. No discovery of mine has made, or is likely to make, either directly or indirectly, for good or ill, the least difference to the amenity of the world."[183] Hardy called pure mathematics 'serious' rather than 'trivial'.[184] To Hardy, "A mathematician, like a painter or a poet, is a maker of patterns."[185] "The mathematician's patterns, like the painter's or the poet's, must be beautiful; the ideas, like the colours or the words, must fit together in a harmonious way."[186] Hardy was "interested in mathematics only as a creative art".[187] In the words of Alfred North Whitehead, the co-author with Bertrand Russell of *Principia Mathematica*, "The science of Pure Mathematics … may claim to be the most original creation of the human spirit," one possible rival being music.[188]

In Hardy's words, there is "a certain generality and a certain depth"[189] in pure mathematics. By generality, he meant "A significant mathematical idea … should be one which is a constituent in many mathematical constructs."[190] In Whitehead's words, "It is by the employment of [the] notion [of 'variable'] that general conditions are investigated without any specification of particular entities," such as "the shape-iness of shapes",[191] which are quite irrelevant. It is the task of mathematics to discover a "pattern of relationships among general abstract conditions".[192] However, Whitehead went on to qualify his statements by saying "it is the large generalization, limited by a happy particularity, which is the fruitful conception."[193] As Hardy said, "a property common to too many objects can hardly be very exciting."[194]

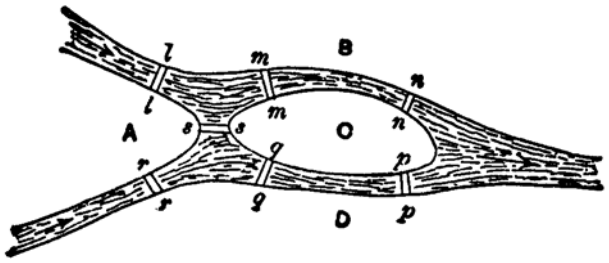
By depth, Hardy meant "ideas that are usually the harder to grasp".[195] Examples of depth are Euclid's proof that there are an infinite number of primes and Pythagoras's proof that $\sqrt{2}$ is irrational, the latter

being deeper than the former. They are deep because they employ general mathematical techniques, these cases being examples of *reductio ad absurdum*. But there are mathematical theorems that are much, much deeper than these. So much so that "this notion of 'depth' is an elusive one even for a mathematician who can recognize it."[196]

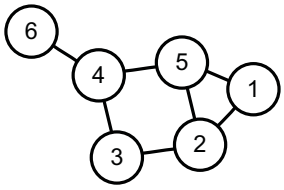
However, it is not true that a property common to too many objects can hardly be very exciting. The Principle of Unity is a universal property applicable everywhere, enabling us to understand what the Universe is and how it is designed, sending the practitioner into rapturous ecstasy with its elegant simplicity.

Transcending the categories

The Hidden Harmony or Cosmic Equation is all-powerful, enabling me to unify mathematics and mysticism by viewing the Universe as a fully integrated information system. The basic construct is mathematical graph, which has evolved from Leonhard Euler's theory of mathematical maps and mapmaking. In 1736, this pre-eminent Swiss mathematician was asked if it were possible to take a walk in Königsberg, the capital of East Prussia, in such a way as to cross every bridge in it once and only once and return to the starting point.[197] The problem is illustrated in this diagram, taken from W. W. Rouse Ball's *Mathematical Recreations and Essays*, which I was given as a mathematics prize as a sixteen-year-old. However, I have since discovered from the Google map of what is now Kaliningrad in Russian Kaliningrad Oblast that the diagram is the wrong way round. East should be west and vice versa, and most of the bridges have since been demolished.



In Euler's time, he solved this problem through mathematical abstraction, by representing bridges as arcs between land masses, viewed as nodes. In this way, he took a conventional map of the surface of the Earth and turned it into a construct of great generality. Mathematical maps are today called mathematical graphs, illustrated here, which consist simply of nodes and the relationships between them, a structure that is universal. Examples are the Internet, the 'web of life' in systems theorists' terms,[198] and Indra's Net of jewels[199] mentioned several times in the *Avatamsaka Sūtra*,[200] "the consummation of Buddhist thought, Buddhist sentiment, and Buddhist experience", as D. T. Suzuki put it.[201]



For myself, I inwardly view a mathematical graph as a structure consisting of forms, as nodes, with the arcs being meaningful relationships. Each node, as a form, is also a structure consisting of meaningful relationships between forms.

This explains why holistic science is so much more interesting and meaningful than reductionist science. The word *interesting* drives from Latin *interesse* 'to be between, take part in', from *inter* 'between' and *esse* 'to be'. So what is interesting, important, and essential is not the interest that banks receive in today's debt-driven, divisive economy, or more generally things in themselves, but the *relationships* between entities, a word also derived from *esse*. In contrast to holistic scientists, reductionist scientists, focused on objects rather than the relationships between them, throw the interesting associations and connections away! That is why it is absolutely essential to include relationships in a coherent scientific worldview.

The mathematical graph is also the basis of my meditation practice. First, applying the involutionary, apophatic practice of *via negativa*, I sink deeper and deeper into forms, as structures, until eventually the nodes disappear and become singularities between the relationships. For viewed from the Numinosphere, this analytical process cannot continue indefinitely; it has a culminating point. Then, as I sink even deeper, even the relationships between the singularities disappear into a sole Singularity, which is the Divine Origin of the Universe, as Oneness, at the Centre of the Numinosphere.

Conversely, expanding consciousness through the evolutionary, kataphatic exercise of *via positiva*, I view any one structure as a node in an even broader structure, a process that terminates in Wholeness, which is the entire Numinosphere, viewed both as an aggregate of the entire Totality of Existence, and in itself, as the Formless Absolute. This is an experimental approach, showing that Oneness and Wholeness are Immanent and Transcendent with respect to a meditating human being.

Curiously, matching theory and practice, the cognitive approach produces the opposite result. As mentioned on page 18, I was able to form the concept of the Absolute in 1983, comparatively early in my rational and spiritual development. I did so by using the universal, egalitarian method of concept formation by looking at the similarities and differences in the data patterns of experience, emerging from the Datum of the Universe.

First, viewing the Absolute conceptually as a unity, we can see that it differs from all its parts, for all these parts are limited in some way. In contrast, the Datum cannot be defined, for to do so would be to give it boundaries, to say what it is and what it is not. This is obvious from the word *define*, which comes from the Latin *dēfīnīre* 'to limit' or 'to end'. The Absolute is thus indefinable and unanalysable, qualities that are transcendent with respect to a knowing being.

On the other hand, when we view the Absolute as the Totality of Existence, we can see that the assembled structure of all its parts is exactly the same as the structure of any of its parts, for the Universe has an underlying, unified structure, independent of and prior to interpretation by a knowing being. The relationships that form this web of life lie within everything there is; they are the glue that holds the entire Universe together. From this perspective, we can say that the Absolute possesses the property of immanence with respect to all beings in the relativistic world of form, with meaningful relationships being the motive power of the Universe.

In summary, there are two pairs of dual ways in which we can understand and experience the Absolute, given in this table, thus systemically establishing God as a rational and hence scientific concept.

	Oneness	**Wholeness**
Experiential	Immanent	Transcendent
Conceptual	Transcendent	Immanent

For me, this meditation practice is absolutely essential when healing the split between mysticism and science. For all the words I used in the previous chapter to describe the Numinosphere, as I experience it, denote concepts in the mind, no different from any other concepts that I form to represent beings in the relativistic world of form. So God is no longer a mystery, beyond the comprehension of the rational mind, as spiritual teachers have said through the ages.

Relational model of data

To explain this further, although humans are delightfully complex and varied, Apple's graphical user interface provides us with the simple construct with which we can build a comprehensive map of the Cosmic Psyche, and hence the Universe. The desktop metaphor is based on object-oriented modelling methods that evolved from SIMULA (SIMUlation LAnguage), which Kristen Nygaard, Ole-Johan Dahl,

and Bjørn Myhrhaug developed at the Norwegian Computing Center in the 1960s. Simula is a computer language intended to simulate the operation of systems composed of discrete events, such as traffic patterns in towns and cities, communication networks, or the day-to-day operation of a retail business.[202]

This programming language is able to simulate activities in the 'real world' because at its heart are the concepts of universals and particulars, which formed the infrastructure of Plato's *Republic*, describing his attempt to design a utopian state, the Athenian democracy having sentenced his beloved Socrates to death for corrupting the minds of the youth of Athens. Plato used *parousiā* to distinguish his eternal Forms from particulars, by saying that the former have presence, while the latter 'share in' or 'partake of' the Form, from the Greek *metechein*,[203] *metecho* also meaning 'enjoy with others'. This is a vitally important point, for all structures have a surface and an inner essence, illustrated further on page 67, which in humans is called *soul* and in the Cosmos *Love*, the Divine Essence we all share.

In object-oriented models, universals and particulars are called classes and objects, or instances of classes, respectively. For instance, in the desktop metaphor, the class **File**, depicted by icons, has many instances. And in a word processing document, there are many instances of the class **Word**. In turn, files and words, as entities, have many attributes, such as type and creation date, for files, and font and size for characters in words. These correspond to Aristotle's subjects and predicates with which he studied syllogistic deductions,[204] at the birth of logic, as the science of reason.

Linear mathematical logic then led to the invention of the stored-program computer in the 1940s, supposedly a machine that has the potential to execute any cognitive process that humans can perform. However, programs in computers execute instructions sequentially, albeit in many parallel threads in modern multi-headed central processing units, collectively collaborating in networks, such as the Internet, as a whole. But this is not how we humans think and organize our ideas.

This became crystal clear in the 1950s with the invention of direct access storage devices (DASD), such as disks, overcoming many of the difficulties of storing and retrieving data on magnetic tapes, essentially sequential devices. For data stored on such disks could be organized both hierarchically and nonhierarchically, in networks, leading to a polarizing conflict between these two approaches.

In the event, Ted Codd of IBM showed in 1970 how such conflicts could be resolved by introducing the relational model of data,[205] based on the mathematical theory of relations and first-order predicate logic. As I realized in 1972, when I first read this paper as a systems engineer in an IBM sales office, this was the most significant paper in the entire history of the data processing industry for it introduced a mathematical representation of data itself, the basic resource in the industry. However, Codd's paper did not immediately resolve the conflict. In 1974, a meeting of adversaries was held on the nonhierarchical versus the relational model, known as the 'Great Debate'.[206]

Furthermore, by drawing on the pioneering work of Charles Sanders Peirce in the 1880s,[207] Codd introduced a nondeductive logic, the most radical change in the science of reason since Aristotle in the fourth century BCE. The relational model of data then led to the birth of a multibillion-dollar industry. Today, you cannot order a book or airline ticket on the Internet without invoking the relational model behind the scenes.

So what is the relational model of data? Well, in essence, it is simplicity itself. A relation in the relational model is just a table, like the telephone directory below, listing names, addresses, and telephone numbers of subscribers. Here, telephone subscribers, called **entities**, are gathered together in sets called **classes**. In the relational model of data, such class instances possess **attributes**, as in object-oriented modelling methods.

Class	*Telephone subscriber*		
Attribute name	*Name*	*Address*	*Telephone number*
Attribute values	Anne Potter	72 Grove Road	624-4582
	Fred Tanner	4 Meadow Walk	982-3356
	John Cooper	31 Beech Boulevard	104-3911
	Elizabeth Smith	7 Chestnut Avenue	310-4574
	Jackie Butler	25 Orchard Way	955-4395
	Richard Fisher	67 Willow Crescent	109-2661
	Jenny Walker	22 Heather Drive	893-2748

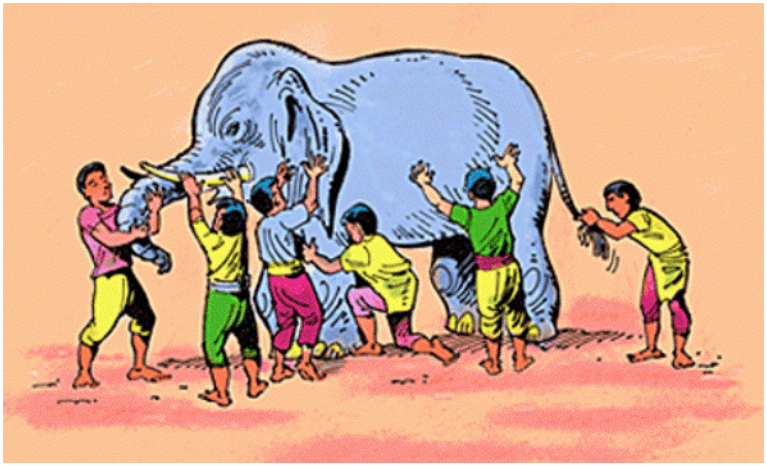
We have been keeping records in such tables since the very first civilizations. For the first writing to be discovered on a clay tablet in Uruk (modern Erech) dates back to 3300 BCE, detailing the allotment of malt to a number of people and with stock accounts of barley on the reverse.[208]

Of course, such relations do not exist in isolation. In 1976 Peter Pin-Shan Chen published a paper titled 'The Entity-Relationship Model: Toward a Unified View of Data',[209] in which he showed how a mathematical graph could be adapted to depict the relationships between relations, as arcs between nodes.

So why don't we all think by making these organizing concepts explicit in our minds? Well, one reason why we do not consciously use the primal concepts of **class**, **entity** (as **instance** of class), and **attribute** as the basis of our mental mapmaking activities is that during the past several thousand years, noogenesis has been more divergent than convergent. As a result, our minds have become fragmented, and society, as a collective projection of our minds, has become divided into religious and national factions, academic specialization, and the division of labour in the workplace

Healing the fragmented mind

The problem of fragmentation is not new, as the ancient Indian story of six blind men and an elephant well illustrates. There are several versions and interpretations of this story, but basically six blind men are asked to touch a part of an elephant and say what the elephant as a whole is like. As depicted in the following picture, they touch the trunk, tusk, ear, leg, side, and tail and say that the elephant is a snake, spear, fan, tree, wall, and rope, respectively. Of course, they don't agree and much conflict and argument ensues, the story of the human race.



One way of interpreting this story is for us to learn that whatever our specialisms might be, we should respect the views of others, who might be looking at the elephant from a different perspective. But such specialist perspectives do not tell us anything about the elephant as a metaphor for the Absolute Whole,

Ultimate Reality, and the Supreme Being. For, as J. Krishnamurti wrote in *Education and the Significance of Life*, "Can any specialist experience life as a whole? Only when he ceases to be a specialist."[210]

Tragically, the principal consequence of the fragmented, divisive way that evolution has unfolded over the years is that our entire species has become deluded with a distorted view of the world we live in. Erich Fromm was one of the first to recognize this fundamental characteristic of humanity, in 1956 writing a book titled *The Sane Society*, whose first two chapters are, "Are We Sane?" and "Can a Society be Sick?", answering these questions with a resounding 'NO' and 'YES', respectively.[211] What is regarded as the normal behaviour of a society can be considered to be pathological.

This is not conventional wisdom. We normally say that individuals can be deluded, not an entire society collectively holding on to a set of beliefs.[212] Furthermore, individuals are deemed to be mentally healthy if they are assimilated into the 'real world', that is the culture they live in. People who are detached from 'reality' in this way are often called 'schizophrenic', from Greek, *skhistos* 'split, divided', cognate with *science*, and *phren* 'mind'. But what do we call an entire culture that is cognitively and experientially detached from Reality, as Western civilization is today? Can we use any other epithet than *schizophrenic* for such a society? It is not surprising, therefore, that J. Krishnamurti wisely said, "It is no measure of health to be well-adjusted to a profoundly sick society."[213]

Traditionally, the main way of dealing with the deluded, schizoid mind has been to kill the mind through the path of *via negativa*. As Ramana Maharshi said, "By the inquiry 'Who am I?' the thought 'Who am I?' will destroy all other thoughts, and, like the stick used for stirring the burning pyre, it will in the end get destroyed. Then there will arise Self-realization."[214] And when asked by a devotee how she could get rid of the mind, Ramana replied, "Is it the mind that wants to kill itself? The mind cannot kill itself. So your business is to find the real nature of the mind. Then you will know that there is no mind."[215]

Needless to say, while killing the mind can help us realize our True Nature and Authentic Self, such extreme measures do not help us to manage our day-to-day practical affairs. For this, we need the understanding that arises from theories, through the path of *via positiva*. For as Peter Medawar has said, "Who nowadays would try to build an aeroplane without trying to master the appropriate aerodynamic theory? Sciences not yet underpinned by theory are not much more than kitchen arts."[216]

In a similar manner, information systems architects cannot design and develop integrated life-enhancing systems in business without a comprehensive theory of evolution, which is in harmony with the fundamental laws of the Universe, explaining what causes us humans to behave as we do. And fairly obviously, we cannot develop a comprehensive map of the noosphere through deluded, schizoid minds. We can only discover what it truly means to be a human being with Self-reflective Intelligence, lit by the coherent light of Pure Consciousness, which is the Numinosphere or *Milieu Divin*.

Evolution of scientific method

But how are we to ensure that the ideas we organize in our minds are valid? There is very little point in creating cognitive structures if they are not soundly based on scientific method, free of any cultural or personal beliefs that might distort our reasoning, leading us into delusion. That is another great challenge facing humanity today. While scientific method has been improving since its origins in ancient Greek philosophy, it has not been able to clear away the delusions that drive our scientific, technological, and business affairs today. So let us look a little at the evolution of scientific method to see how it could be improved in order to heal our deeply fragmented minds.

The first great idea in scientific method, to free it from the mistakes of Aristotle, in particular, was Roger Bacon's notion of experimentation as a key principle to test the validity of scientific knowledge in the thirteenth century. Bacon was an English Franciscan philosopher, who became known as *Doctor Mirabilis* 'Wonderful Teacher' throughout Europe. He saw that sound knowledge could not be based just on observation, on hearsay, or on rational deductive logic, like Aristotle's, without the experience that arises from conducting experiments. He is thus viewed as a harbinger of modern science more than 300 years before it began to come into bloom.[217]

Roger's namesake, Francis Bacon, was the next to pick up the baton, even while holding the position of Lord Chancellor of England. Bacon's great work was titled *Novum Organum* (*The New Organon*), which is a reference to Aristotle's *Organon* or *Instrument for Rational Thinking*, in which Aristotle defined the syllogism, laying down the foundations of deductive logic. *The New Organon*, published in 1620, was intended as Part II of what Bacon called *Instauratio Magna*, the *Great Instauration* or *Great Renewal*, from Latin *instaurāre* 'to restore, renew; set up, establish'.

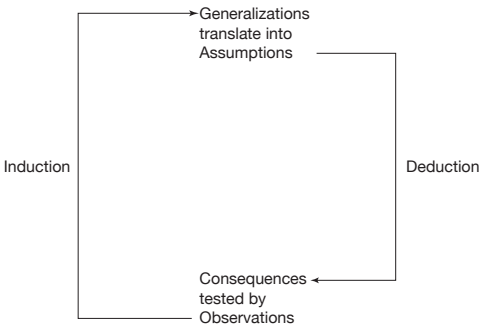
In the Preface to the *Great Instauration*, Bacon said, "the wisdom we have drawn in particular from the Greeks seems to be a kind of childish stage of science … too weak and immature to produce anything."[218] Accordingly, he saw the need to go beyond the Pillars of Hercules, where Plato considered Atlantis to lie,[219] depicted on the title page of *Instauratio Magna*, symbolically representing the limits of learning.[220]

In his Plan for the *Great Renewal*, Bacon sought to place the foundations deeper and further back than ever done before, saying, "What the sciences need is a form of induction which takes experience apart and analyses it, and forms necessary conclusions on the basis of appropriate exclusions and rejections."[221] To this end, Bacon regarded the physical senses as the primary way of acquiring knowledge and natural philosophy as the great mother of the sciences, for the arts and sciences cannot grow when they are cut off from their roots.[222]

So Bacon's philosophy of science was something of a mixed blessing, distorted by the traditional Western worldview that provided the overall context for his thoughts. For instance, in Book I of *The Proficiency and Advancement of Learning, Divine and Human* published in 1605 in English, later translated into Latin,[223] Bacon famously said, "the last or furthest end of knowledge … [is] for the glory of the Creator and the relief of man's estate,"[224] reflecting the arrogant belief that Nature is separate from humanity and that human beings hold dominion over our natural environment. He repeated this sentiment in the opening of the Preface to the *Great Renewal*, saying, "A quite different way must be opened up for the human intellect than men have known in the past, and new aids devised, so that the mind may exercise its right over nature."[225]

However, in 1739, the Scottish philosopher David Hume pointed out that there is a serious weakness of the inductive method.[226] The principle of induction in science, not to be confused with induction in mathematics,[227] is apparently very simple. It can be defined as follows:

> If a large number of As have been observed under a wide variety of conditions, and if all those observed As without exception possessed the property B, then all As have the property B.[228]



The principle of induction thus leads to generalized statements, from which predictions about particular situations can be deduced in a mechanistic universe. This diagram shows the cyclical relationship of induction to deduction, indicating that induction does not actually start from observation free of

assumptions.[229] This is what A. F. Chalmers calls 'naive inductionism'[230] in *What is this thing called Science?*, a standard textbook on scientific method for students at the Open University in the UK. For in practice all observation statements are theory dependent.[231] It is not possible to observe anything without some preconceptions of what is being observed.

If science is to produce certain knowledge, these generalizations need to be true for all time. Hume raised two problems with this assumption of science, the first logical and the second psychological, which are discussed by Karl Popper in *Objective Knowledge*. The first of these problems is:

> Are we justified in reasoning from [repeated] instances of which we have experience to other instances [conclusions] of which we have no experience?[232]

The answer is no, however great the number of repetitions. For instance, for those of us who live between the Arctic and Antarctic circles, the sun rises every day, even though on some occasions we don't see it because clouds hide it. But is it reasonable to assume that this process will continue indefinitely? Obviously not. Physicists have estimated that in some five to six billion years the Sun will die along with the Earth.[233] So one day soon, there will be neither a sunrise nor anyone around to observe it.

Hume goes on to pose his psychological problem of induction:.[234]

> Why, nevertheless, do all reasonable people expect, and *believe*, that instances of which they have no experience will conform to those of which they have experience? That is, why do we have expectations in which we have great confidence?[235]

His answer to this problem, interpreted by Popper, is:

> Because of 'custom or habit'; that is, because we are conditioned, by *repetitions* and by the mechanism of the association of ideas; a mechanism with which, Hume says, we could hardly survive.[236]

Hume's attack on empiricism evidently caused a major crisis in the scientific community, for he was questioning the very basis of scientific reasoning. Bertrand Russell highlighted the issue when he said in his inimitable manner:

> It is therefore important to discover whether there is any answer to Hume within the framework of a philosophy that is wholly or mainly empirical. If not, there is no intellectual difference between sanity and insanity. The lunatic who believes that he is a poached egg is to be condemned solely on the grounds that he is a minority, or rather—since we must not assume democracy—on the grounds that the government does not agree with him. This is a desperate point of view, and it must be hoped that there is some way of escaping it.[237]

So how could scientific method extricate itself from this situation? Well, what occurred next is one of the most extraordinary happenings in the entire evolution of the mind: philosophers of science sought to remove psychology from scientific method, just as mathematicians had earlier removed logic from psychology, as we see on page 52. To do this, Popper distinguished the existence of two different senses of knowledge or of thought, once again violating the Principle of Unity, as is customary in Western civilization:

(1) *knowledge or thought in the subjective sense*, consisting of a state of mind or of consciousness or a disposition to behave or to react, and

(2) *knowledge or thought in the objective sense*, consisting of problems, theories, arguments as such. Knowledge in the objective sense is totally independent of anybody's claim to know; it is also independent of anybody's belief, or disposition to assent; or to assert, or to act. Knowledge in the objective sense is *knowledge without a knower*: it is *knowledge without a knowing subject*.[238]

Chalmers vigorously supported this split by saying, "I accept, and presuppose throughout this book, that a single, unique, physical world exists independently of observers."[239] Einstein held a similar view. In 1931, when commemorating the centenary of James Clerk Maxwell's birth, he wrote, "The belief in an external world independent of the perceiving subject is the basis of all natural science."[240]

Popper similarly believed in an objective reality independent of a knowing being. To support this view of science, in *Objective Knowledge*, he suggested "that it is the aim of science to find *satisfactory*

explanations, of whatever strikes us as being in need of explanation." By *explanation*, he meant finding the unknown but true causes (the *explicans*) that logically entail that which is to be explained (the *explicandum*). "Thus, scientific explanation … will be *the explanation of the known by the unknown*."[241]

Now the ultimate unknown *explicans* is the Formless, Nondual Absolute, which some say is unknowable, lying as it does deep within and far beyond the relativistic world of form as Immanence and Transcendence or Emptiness and Fullness. However, this *explicans* is not accepted as the basis of all scientific reasoning.

The logical positivist, A. J. Ayer stated a reason for rejecting the Truth from science in *The Central Questions of Philosophy*, writing:

> The mystic develops a special faculty which enables him to see what he reports to us, no doubt inadequately, by saying such things as that reality is spiritual, or that time and space are not ultimately real, or that everything is one. But what are we to make of this? The question is not whether mystical experiences are worth having. The verdict of those who have actually had them is very decidedly that they are. The question is whether they yield knowledge; and if so what it is they establish.[242]

He ended this short section on 'Evaluation of Mystical Experience' with this passage: "It is surely obvious that no experience, however intense, can possibly establish such propositions as that reality is spiritual, or that time and space are unreal, or that things which appear to be different are in some manner identical."[243] So the irrefutable propositions "I am Love" and "Consciousness is all there is," which denote the supposedly Unknowable Explicans, based squarely on mystical experience, are refuted. The very basis on which scientific knowledge is to be developed—the experience that arises from experimentation—is denied.

Nevertheless, Chalmers was willing to explore the possibility that scientific facts should not be seen in isolation, but rather "a scientific theory is a complex structure of some kind."[244] As he pointed out, the primary advocate of this view was Thomas Kuhn, who published his landmark book *The Structure of Scientific Revolutions* in 1962.

Kuhn famously called the complex structures of concepts 'paradigms', from the Greek word *paradeiknumi* meaning 'show side by side'. From this, he made a clear distinction between normal science, which works within the context of a particular paradigm, and scientific revolutions, when a radical change is made to the conceptual structures that guide scientific research. This is what generally happens in what Thomas S. Kuhn called normal science:

> ... 'normal science' means research firmly based upon one or more past scientific achievements, achievements that some particular scientific community acknowledges for a time for its further practice.[245]

However, such an approach to science does not satisfactorily describe the process that Copernicus, Kepler, Galileo, and Newton went through in the sixteenth and seventeenth centuries or that of Joseph Priestley and Antoine-Laurent Lavoisier in developing the oxygen theory of combustion in the eighteenth century, obsoleting the earlier phlogiston theory.

By looking at such examples in the history of scientific discovery, Kuhn saw that such a radical change in worldview comes about as the result of anomalies in the overall structure of existing scientific theories; experience no longer matches theory, leading to what Kuhn called a *paradigm change* or *paradigm shift*. Such a transformation is the essence of scientific revolutions, which he described thus:

> ... at times of revolution, when the normal scientific tradition changes, the scientist's perception of his environment must be re-educated—in some familiar situations he must learn to see a new gestalt.[246]

This is very much the case today. Materialistic, mechanistic science cannot begin to tell us what it truly means to be a human being and hence what God and the Universe truly are, as many millions intuitively know today.

Kuhn went on to say that it is as much the consensus of scientific communities that decides what paradigms should be used as rational argument. For no matter how rational scientists claim to be, politics plays a much greater role in science than most are willing to admit. In general, who we know is more important than what we know.

In other words, Kuhn asserted that science is as much a social activity as an objective, rational process, an approach that Chalmers called 'relativism', a relativist being someone who denies that there is a universal criterion that determines whether a particular theory is scientific or not.[247] Kuhn's observation of the world as it is was not too popular in some quarters, although he denied that he was a relativist, holding to the universal criterion that scientific knowledge evolves, like unidirectional, irreversible biological processes. For Kuhn, "Later scientific theories are better than earlier ones for solving puzzles in the often quite different environments to which they are applied."[248]

Even though the subtitle of Karl Popper's *Objective Knowledge* is *An Evolutionary Approach*, Imre Lakatos was one of the leading opponents to Kuhn's view of scientific progress. While supporting the notion that scientific theories are structures, Lakatos sought a way of restoring both rationalism and universality to science. He attempted to do this with the concept of an unchangeable 'hard core' that scientific research programmes should adhere to.[249] "The hard core of a programme ... takes the form of some very general theoretical hypotheses from which the programme is to develop."[250] For instance, "The hard core of Newtonian physics is comprised of Newton's laws of motion plus his law of gravitational attraction." Most particularly, "any scientist who modifies the hard core has opted out of that particular research programme,"[251] typically being ostracized by her or his colleagues.

It is therefore not surprising that scientists with a mystical or even spiritual orientation have been very careful to keep their experiences secret. For the hard core of materialistic science is the second pillar of unwisdom, denying the truth of the second pillar of wisdom: Consciousness is all there is, Consciousness being another name for Totality, consisting of both the Formless Absolute and the relativistic world of form. And the universal principle that underlies the whole of Western thought, scientific or otherwise, is the seventh pillar of unwisdom, whose antidote is the Principle of Unity, thereby ending the war between philosophers of science.

Paul Feyerabend made some progress in this direction, being concerned that these fixed, hard-core paradigms and methods could inhibit the growth of scientific knowledge. In *Against Method*, he therefore proposed an anarchistic approach to learning in which "anything goes."[252] Most particularly, he wanted to challenge the claim that scientific method is superior to any other method of developing knowledge about ourselves and the world we live in. For if science is to play its full part in the world, we need to look at it in the context of the social environment in which it is taking place. As Feyerabend said, we need to "free society from the strangling hold of an ideologically petrified science just as our ancestors freed *us* from the strangling hold of the One True Religion!"[253]

In other words, as a growing number of scientists are beginning to realize, if humanity is to resolve the great crisis it is facing at the present time, we need to free science of scientism, a generally derogatory term indicating a belief in the omnipotence of scientific knowledge and techniques.

Ken Wilber has sought to overcome the problem of scientism in his attempts to integrate science and spirituality by introducing a radically new approach to scientific method. Following St Bonaventure and Hugh of St Victor,[254] Ken points out that we human beings have three modes or eyes of acquiring

knowledge: "the *eye of flesh*, by which we perceive the external world of space, time, and objects; *the eye of reason*, by which we attain knowledge of philosophy, logic, and the mind itself; and the *eye of contemplation*, by which we rise to a knowledge of transcendent realities".[255]

Ken then goes on to assert that the same scientific method can apply to each of these three eyes, what he calls "the three strands of all valid knowing":

> *Instrumental injunction*. This is an actual practice, an exemplar, a paradigm, an experiment, an ordinance. It is always of the form, 'If you want to know this, do this'.
>
> *Direct apprehension*. This is an immediate experience of the domain brought forth by the injunction; that is, a direct *experience* of apprehension of data (even if the data is mediated, at the moment of experience it is immediately apprehended). William James pointed out that one of the meanings of 'data' is direct and immediate experience, and science anchors all of its concrete assertions in such data.
>
> *Communal confirmation (or rejection)*. This is a checking of results—the data, the evidence—with others who have adequately completed the injunctive and apprehensive strands.[256]

That, as far as I can tell, is as far as the philosophy of science has reached today, for people generally don't know that there is only one Eye in Reality: Self-reflective Divine Intelligence, sometimes called the Witness in spiritual circles. For as Meister Eckhart said, "The eye with which I see God is the same as that with which he sees me."[257]

Besides, why should there be a consensus for valid, authentic knowledge? There was no consensus for Newton's unification of Kepler's celestial physics and Galileo's terrestrial dynamics while he was writing his magnum opus, and not so much afterwards. Shortly after the publication of *Principia*, Newton heard a student passing him in the street at Cambridge saying, "there goes a man that writt a book that neither he nor any body else understands." Even Edmund Halley, *Principia*'s midwife, was utterly astonished as successive versions of this work appeared.[258] And as Voltaire ruefully said in his *Letters on England*, written around the time of Newton's funeral in 1727, the French Cartesians had still not accepted the notion of 'action-at-a-distance', even forty years after the publication of *Principia*.[259]

To resolve all these weaknesses in scientific method, we need to turn to another vitally important of aspect of scientific reasoning that philosophers of science seem to have completely overlooked. In August 1878, the *Popular Science Monthly* published a paper by Peirce titled 'Deduction, Induction, and Hypothesis', the sixth and final paper he wrote on 'Illustrations of the Logic of Science'. With the thoroughgoing, systemic approach of his triadic logic, Peirce went back to basics.

Peirce first called the major premise, minor premise, and conclusion of the syllogism 'rule', 'case', and 'result', respectively. He then showed that these three terms could be arranged in three different ways, shown in the table below.[260] He later called hypothesis *retroduction* or *abduction*, the latter term being most commonly used today. Abductive reasoning seeks to determine the causes of the phenomena that we observe as symptoms, giving three linear approaches to scientific method.

	Analytic	**Synthetic**	
	Deduction	**Induction**	**Hypothesis**
Given	Rule	Case	Rule
	Case	Result	Result
Inference	Result	Rule	Case

Deduction reasons from causes to effects.
Induction reasons from specific cases to general rules.
Abduction reasons from effects to causes.

I first came across abduction as an integral constituent of scientific method in the 1980s from general-purpose expert systems in artificial intelligence, which were popular during that decade. "An expert system is a computing system capable of representing and reasoning about some knowledge-rich domain, such as internal medicine or geology, with a view to solving problems and giving advice," as Peter Jackson

tells us in his standard textbook on the subject.[261] As such inferential expert systems emulate the decision-making ability of a human expert, they were clearly related to my work on decision support systems with IBM in the late 1970s.

The method of abduction in expert systems was also of central importance to my studies of causality, in particular explaining what is causing scientists and technologists to drive the pace of evolutionary change at exponential rates of acceleration. Harry E. Pople Jr. laid down the foundations of mechanistic abduction in 1973, defining it thus: 'The essence of abductive inference is the generation of hypotheses, which, if true, would explain some collection of observed facts.'[262] Such abductive, aetiological processes were then built into *Internist*, a medical diagnostic tool that was intended to overcome the limitations of *Mycin* and other similar expert systems.[263]

In my case, I was seeking to find a way of testing the hypothesis that there are nonphysical, psychospiritual energies at work in the Universe as well as the physical ones recognized by materialistic, mechanistic science. However, I was not attracted to the ways that expert systems test hypotheses using Bayes' theorem in probability theory,[264] not the least because such quantitative mathematical methods do not lead me to Wholeness and the Truth, to the complete unification of mysticism and science, which has been the central theme of my life since 1949. Furthermore, as Harald Cramér wrote in my undergraduate textbook on the subject, Bayes' theorem presents serious difficulties when attempting to apply it to practical situations.[265]

But that has not stopped Bayes' theorem being widely used today to study situations where much information is uncertain, as we look at later when looking at the implications of the Copernican and Anthropic Principles for the future of humanity. It is therefore rather surprising that Peirce's abductive reasoning has not entered scientific method, as indicated by the fact that the word *abductive* is not in the *Oxford English Dictionary* or any other dictionary that I have consulted.

Yet, we need abductive reasoning to discover how we could heal our grievously sick society, looking at the medical diagnosis of symptom, cause, cure, and remedy in turn. In *To Have or To Be?*, Erich Fromm was much inspired by Shakyamuni Buddha in this respect. For the Buddha, as the first mystical psychologist, used abductive reasoning as the basis of his teachings, as an extension of his three marks of being, listed on page 18. Nonrecognition of the four Noble Truths is ignorance (*avidyā*), briefly stated here:

1. All existence is characterized by suffering, arising from sickness, old age, and death, and does not bring satisfaction (*dukhka*).
2. Suffering is caused by a craving for what one desires, binding beings to the ever-changing cycle of existence (*samsāra*).
3. The cessation of suffering comes when we let go of attachment to the relativistic world of form.
4. The means for the ending of suffering is the eightfold path of right, perfect, or complete view, resolve, speech, conduct, livelihood, effort, mindfulness, and concentration.[266]

Holoramic scientific method

So given that scientific method is in a rather uncertain state today, how can we explain in a thoroughly scientific manner what is causing scientists and technologists to drive the pace of evolutionary change at exponential rates of acceleration? How can we scientifically establish the hypothesis that there are psychospiritual energies at work in the Universe, when many scientists deny the existence of such energies?

Well, given the turbulent state of the world, we need to follow Einstein's observation that you cannot solve a problem with the mindset that created it. This is one of many paraphrases of a statement he made in an article titled 'The Real Problem Is in the Hearts of Men', published in the *New York Times Magazine* on 23rd June 1946, which began with these words: "Many persons have inquired concerning a recent message of mine that 'a new type of thinking is essential if mankind is to survive and move to higher levels'." He then went on to write, "Past thinking and methods did not prevent world wars. Future thinking *must* prevent wars."[267] For, as he said in an address at the fifth Nobel anniversary dinner in New York on 10th December 1945, "The war is won, but the peace is not. The great powers, united in fighting, are now divided over the peace settlements."[268]

We can best develop a new way of thinking that leads to Inner Peace and hence World Peace through a thought experiment, not unlike those that that Einstein created in order to develop the special and general theories of evolution.[269] For science is based on the experiences that are gained from experiment. And this applies just as much to our observations of experiments conducted within our minds as it does to those performed in scientific laboratories around the world.

But how are we to ensure that such personal experiments lead to universal understanding, not only applicable to the researcher conducting the experiment? Well, we can avoid the subjectivity of such an experiment by standing outside ourselves. For, as Douglas R. Hofstadter said in *Gödel, Escher, Bach: An Eternal Golden Braid*, "it is an inherent property of intelligence that it can jump out of the task which it is performing, and survey what it has done; it is always looking for, and often finding patterns." Being a leading advocate of artificial intelligence in computers, he suggests in his brilliant, but infuriating book, that computers have the ability to jump out of the system, just as much as humans do. But he then adds a human touch, writing,

> Of course, there are cases where only a rare individual will have the vision to perceive a system that governs many people's lives, a system which had never before even been recognized as a system; then such people often devote their lives to convincing other people that the system really is there, and that it ought to be existed from![270]

If we consider this system to be the dysfunctional Western civilization, many millions today are seeking ways of jumping out of the system, some even becoming monks and nuns, withdrawing from society completely in order to live in union with the Divine. To heal my fragmented, split mind, I have needed to do likewise, viewing the Cosmos from the vantage point of the Absolute, the Datum of the Universe. As mentioned on page 25, I call such a Whole-seeing vantage point Holoramic, viewing the Totality of Existence with the undivided Supermind, in Aurobindo's terms.

What this means is that if evolution is to become fully conscious of itself within us humans, it needs to pass through a discontinuity, freeing itself of all the developments that have happened during the past fourteen billion years. For with the Hidden Harmony as guidance, we can only reach what Teilhard called the Omega Point of evolution by starting afresh at the very beginning, at the Alpha Point, at the Divine Origin of the Universe, prior to any big bangs erupting from black holes.

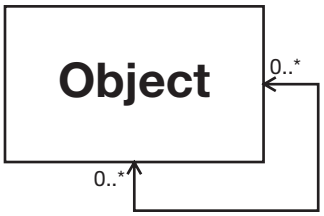
For myself, the best way of describing the discontinuity in evolution I experienced in the spring of 1980 is that I imagined that I was a computer that switched itself off and on again so that it had no programs within it, not even a bootstrap program to load the operating system. By starting afresh at the very beginning with a *tabula rasa* 'clean slate', this computer then had the task of integrating all knowledge in all cultures and disciplines into a coherent whole, internally modelling the Internet, creating what Ken Wilber calls a 'Superhuman OS'.

As mentioned on page 13, I began this thought experiment in order to determine whether the global economy would self-destruct because artificial intelligence is possible or it is not. But rather than trying to program a computer to answer Alan Turing's question, "Can machines think?", I reversed the imitation game that he proposed to test the hypothesis that the answer is yes, as I describe in a 2015 essay titled 'The Evolution of Universals: Being a Universal Human'.

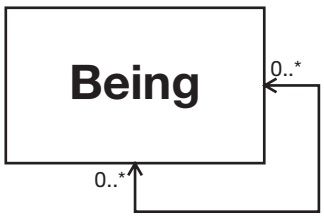
However, software developers do not generally start programming with no idea of the system that they are to design. Rather, like architects who design houses and office blocks, information systems architects often begin with blueprints, in what is called Model-Driven Architecture (MDA). It is therefore not surprising that information systems architects in business are turning to Christopher Alexander's *A Pattern Language*, incorporating 'the quality that has no name': egoless, alive, free, eternal wholeness.[271] I have followed a similar process in mapping the Cosmic Psyche, as the noosphere.

The key here is the concept of generalization hierarchy in object-oriented modelling methods. An example of such a structure is the tree of life, in which we successively categorize humans in broader, more abstract classes as primate, mammal, vertebrate, and animal, as we look at further in Section 'The taxonomy of the species' on page 76. So **Animal** and **Plant** are the superclasses of the animal and plant kingdoms, respectively, whose superclass is **Cellular living being**.

In object-oriented modelling methods, the superclass of all business classes, depicted in semantic class diagrams, like mathematical graphs, is that of **Object**, each of which is related to any other object in zero to many ways, illustrated in this diagram in the notation of the Unified Modeling Language (UML). UML was developed in the 1990s by Grady Booch, James R. Rumbaugh, and Ivar Jacobson of Rational Software, now a subsidiary of IBM.



However, the concept of object is not general enough to act as the superclass of all classes of concept that we humans might create in order to make sense of the world we live in. For this purpose, I regard **Being** as the superclass of all other classes with which we categorize the data patterns of experience. We can thus draw a complete map of the Universe with just one node and arc showing that all beings in the Universe are related to all other beings in zero to many different ways, some of which can be classified and some of which defy categorization and must remain a mystery. In the words of the New Age mantra, "We are all One." The superclass of **Being** thus enables the consciousness of the individual practitioner to expand and deepen to such an extent that it becomes coterminous with Consciousness, itself.

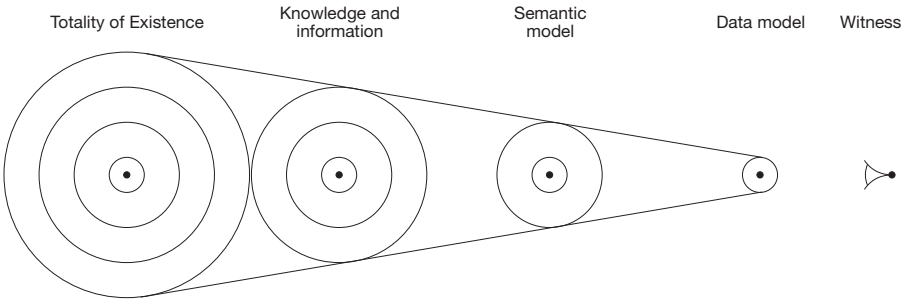


The superclass of **Being** is not a new idea. In essence, it is Aristotle's concept of being, at the heart of his ontology, described in this way:

> There is a science which studies Being *qua* Being, and the properties inherent in it in virtue of its own nature. This science is not the same as any of the so-called particular sciences, for none of the others contemplates Being generally *qua* Being; they divide off some portion of it and study the attribute of this portion, as do for example the mathematical sciences.[272]

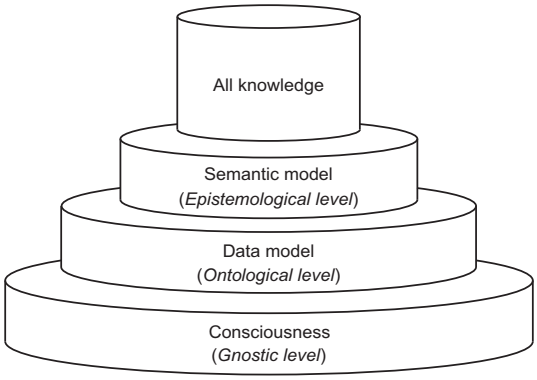
The superclass **Being** is a concept of the utmost generality, denoting any object, event, process, system, organism, state, feeling, form, structure, relationship, field, concept, class, character, symbol, religion, discipline, ism, ology, osophy, theory, language, culture, civilization, or any other way that I, or any other intelligent being, can perceive, conceive, or imagine. **Being** is thus all-inclusive, denoting everyone's theories, opinions, points of view, beliefs, ideas, concepts, values, principles, propositions, theorems, etc., in all cultures and disciplines at all times, past, present, and future.

Aristotle's metaphysics, as used by information systems architects in business, enables us to illustrate the simple structure of the Universe in a number of other diagrams. For the models that IS architects build do not have just one level; they actually have three, each contained within the next level, all seen with Self-reflective Intelligence. These relationships are illustrated in this diagram:

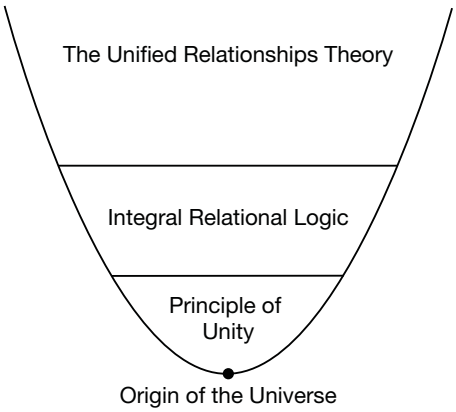


The largest circle on the left represents the Numinosphere, as the Totality of Existence. The circle tangential to this, but also contained within it, is all the knowledge and information that we humans have developed or will develop during the tens of thousands of years of our existence as a species, much of which is contained on the Internet today. In other words, this circle represents the noosphere as a whole, in its entirety, mapping the territory, everything that exists in the Universe. In terms of the relational model of data, the attribute values in the table on page 41 represent a tiny portion of all this information.

However, this is not sufficient for evolution to become fully conscious of itself. For this purpose, we need to map the noosphere, not just the Numinosphere. First, we develop knowledge about knowledge, which corresponds to the semantic models that IS architects develop and Aristotle's epistemology 'study of knowledge', illustrated in this second diagram. For *epistemology* derives from Greek *epistēmē* 'knowledge'. Again, in terms of the relational model of data, the class and attribute names in italics in the table on page 41 are a tiny portion of all this information about information.



Beneath this semantic metamodel is a model of the meaningless data patterns of existence, prior to interpretation by an intelligent being. This ontological model shows that the underlying structure of the Universe is an infinitely dimensional network of hierarchical relationships, which emerge from Consciousness, as the Numinosphere. And at the mezzanine level, between the Gnostic and ontological levels, lies the Hidden Harmony, which applies as much to the Absolute as to the relativistic world of form.



The third diagram I use to illustrate these relationships is this one. The Principle of Unity first emerges from the Origin of the Universe through the action of the Logos, the "immanent conception of divine intelligence" signifying "the rational principle governing the cosmos", as Richard Tarnas put it.[273] In turn, this generates Integral Relational Logic as the much sought-for science of consciousness, which provides the Cosmic Context, coordinating framework, and Gnostic Foundation for the Theory of Everything, or the Unified Relationships Theory, as the Noosphere, as a whole.

To illustrate the relationship of this architectonic to Ken Wilber's, IRL is an example of what he calls an 'Integral Operating System', or IOS,[274] "a neutral framework" that "can be used to bring more clarity, care, and comprehensiveness to virtually any situation".[275] Ken's basic IOS is called AQAL, short for "all quadrants, all levels", which is short for "all quadrants, all levels, all lines, all states, all types".[276] AQAL is thus a two-dimensional example of the multidimensional Cross of Duality, defined on page 16, and therefore not all encompassing. IRL is more like a virtual machine operating system, such as IBM's Virtual Machine (VM), which can run many different operating systems including itself, than Microsoft's Windows or Apple's Mac OS X.

A unified science of mind

On a personal note, I have now healed the split between mysticism and reason, which caused me so much distress as a child, as I mention on page 11. As the Datum provides the Cosmic Context and Gnostic Foundation for all our learning, it unifies the concepts of God and Universe, the incompatible contexts for religion and science, respectively.

Furthermore, this egalitarian approach to concept formation heals the split between depth psychology and mathematical logic. For why should logic, as the science of mind and reason, be separate and so far removed from psychology, as the science of mind and consciousness?

George Boole founded mathematical logic in 1853, inspired by a mystical experience he had had as a seventeen-year-old, twenty-one years earlier.[277] He showed in his *Laws of Thought* how Aristotle's deductive logic could be represented in mathematical notation, leading to the invention of the stored-program computer a century later. To Boole, logic lay at the heart of psychology, as we can see in the opening words of this seminal book: "The design of the following treatise is to investigate the fundamental laws of those operations of the mind by which reasoning is performed," with the purpose of exploring "the nature and constitution of the human mind".[278] Yet, there is no mention of Boole in the eighteen volumes of the *Collected Works* of Carl Gustav Jung, for instance.[279]

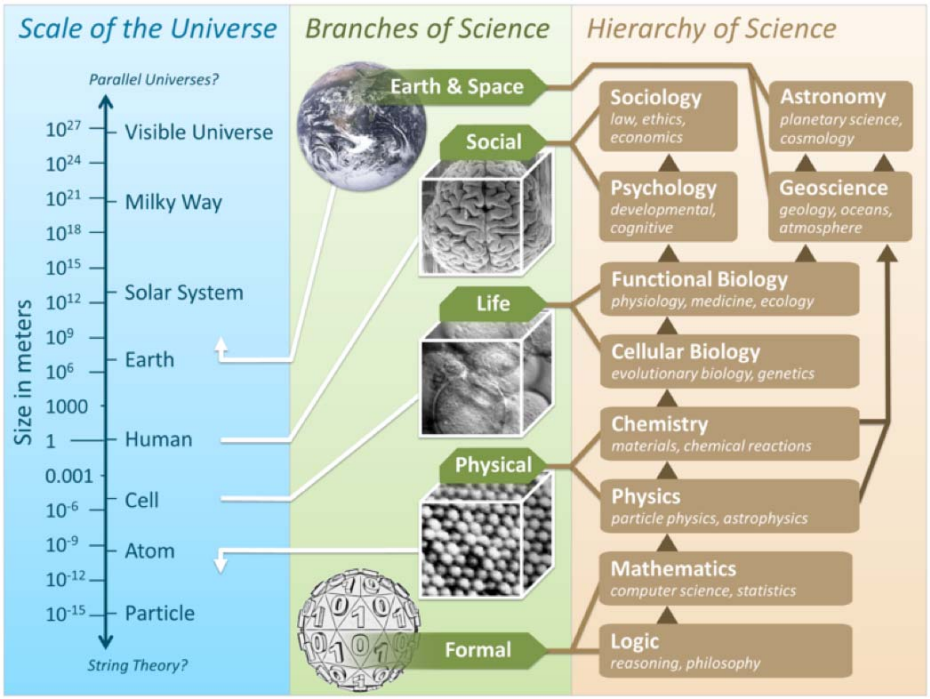
We can see one reason why this is so from Boole's followers in the development of mathematical logic. For instance, in 1865, in the first of a series of lectures 'On the Logic of Science', Charles Sanders Peirce, a great admirer of Boole's pioneering work, said that all the definitions of logic that had evolved during the previous two millennia could be divided into two classes: "those which do not and those which do give to logic a psychological or human character".[280]

In examining the relative merits of these two views of logic, Peirce said, "we ought to adopt a thoroughly unpsychological view of logic", for three reasons. First, "I say that the logical form is already realized in the symbol itself; the psychologists say that it is only realized when the symbol is understood." So "logic needs no distinction between the symbol and the thought; for every thought is a symbol and the laws of logic are true of all symbols." Secondly, Peirce said, "The second advantage of the unpsychological view is that it affords a most convenient means for exploding false notions of the subject," going on to say, "The third advantage of the unpsychological view is that it points to a direct and secure manner of investigating the subject."[281]

Peirce reiterated his determination to keep logic separate from psychology in 1898, when he gave a series of lectures on *Reasoning and the Logic of Things* in Cambridge, Massachusetts. In the exordium for the third lecture titled 'The Logic of Relatives', he said, "My proposition is that logic, in the strict sense of the term, has nothing to do with how you think."[282]

In 1902, Bertrand Russell, co-author of *Principia Mathematica*, and Gottlieb Frege, generally regarded as the founder of first-order predicate logic with a very strange notation,[283] agreed with Peirce. For when being troubled by the paradoxes that had been found in the foundations of mathematics, Russell wrote a famous letter to Frege, notably agreeing with his rejection of any psychological element in logic. [284]

Today, the split between logic and psychology is almost as wide as it could be, as this diagram of scientific disciplines, posted on Wikipedia in 2013, indicates.[285]



The astrophysicist Martin Rees takes a similar view: "The sciences are sometimes likened to different levels of a tall building: logic in the basement, mathematics on the first floor, then particle physics, then the rest of physics and chemistry, and so forth, all the way up to psychology, sociology, and economics in the penthouse. But the analogy is poor," because "Problems in chemistry, biology, the environment, and human sciences remain unsolved because scientists haven't elucidated the patterns, structures, and interconnections, not because we don't understand subatomic physics well enough."[286]

Having seen how we can map the noosphere as a transcultural, transdisciplinary whole, we are now in a position to map any specialist discipline of learning. The obvious starting point for this exercise is psychology, the traditional way of mapping the noosphere. We can then move on to map the disciplines that map the biosphere and hylosphere before mapping the multitude of disciplines involved in mapping human phylogeny as a whole.

But what exactly is the territory that psychologists map with their conceptual models? Well, *psychology* derives from Late Latin *psychologia*, from Greek *psūkhē* 'breath, life, soul, spirit', from *psūkhein* 'to breathe', from PIE base **bhes-* 'to breathe', probably imitative. So when *psyche* entered the English language in 1647, it meant 'the animating principle of the universe as a whole, the soul of the world or *anima mundi*'. Then in 1653, *psychology* was first used in the sense 'study of the human soul', one of three divisions of *anthropology* 'study of humanity', the others being *somatology* and *hæmatology*, the studies of body and blood, respectively.

It was not until 1748 when *psychology* came to mean 'study of the human mind'. The word *mind* goes right back to the tenth and eleventh centuries in the sense 'memory', as we see in such phrases as 'bear in

mind' and 'call to mind', from PIE base **men-* 'to think, remember, have one's mind aroused'. So in 1846, *psychiatry* came to mean 'the study and treatment of mental illness, emotional disturbance, and abnormal behaviour', from Greek *iatreia* 'healing', from *iatros* 'healer'. Psychiatrists are thus 'healers of the mind', a word first used in English in 1890.

However, when Eugen Bleuer, Jung's boss at the prestigious Burghölzli Mental Hospital in Zurich, came to coin *schizophrenia* as a word for one of these mental disorders in 1910, he used the Greek word *phrēn*, which originally meant 'midriff, diaphragm, the upper part of the abdomen', anciently supposed to be the seat of the mind. For me, this makes sense, for when I am asked where I somatically experience consciousness, I say that I do so just above the solar plexus, in the centre of my body, just below my heart, not in my head.

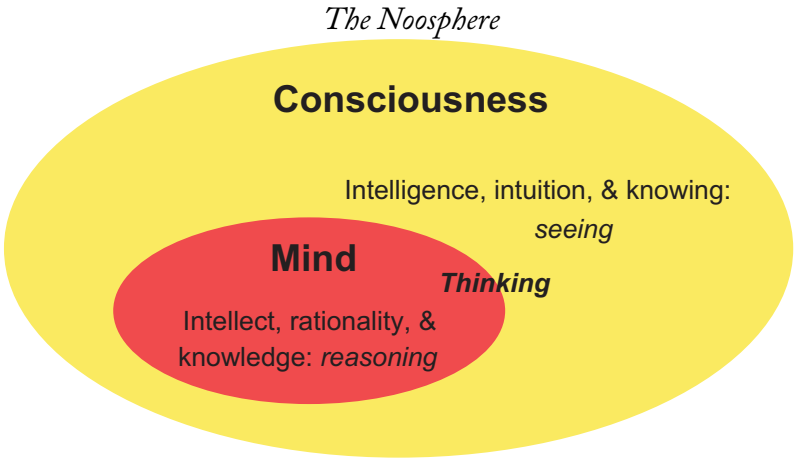
However, *noos*, the Greek word for *mind* not associated with either spirit or the body, has been less used in English. *Nous*, the Attic form of the word, has been used since 1678 to mean 'mind, intellect' and since 1706 as a slang or colloquial word meaning 'intelligence, common sense, gumption'. And *noetic* has been used since 1653 to mean 'of or pertaining to the mind or intellect', from *noein* 'to have mental perception or intelligence', from *noos* 'mind, thought'. Then, recognizing that human learning is an evolutionary process, just like biogenesis in the biosphere, Teilhard coined the word *noogenesis* to mean 'the evolution of the mind', first appearing in English in 1959 in *The Phenomenon of Man*, the first translation of *Le phénomène humain*.

We see this difficulty in finding a suitable language in which to describe the maps that we develop of the Cosmic Psyche in other languages. For instance, Jung wrote in German, which has no unambiguous word for the English *mind*, as R. F. C. Hull, the principal translator of Jung's *Collected Works* has pointed out. The German words *Geist* 'spirit' and *Seele* 'soul' can both be translated as 'mind', and Jung used these words interchangeably in the 1920s. We also see this dual meaning of *Geist* in Hegel's *Phänomenologie des Geistes*, which is translated as both *Phenomenology of Spirit* and *Phenomenology of Mind*.

However, by 1933, in an essay titled 'The Real and the Surreal', Jung exclusively used the word *psyche* to denote the 'real' subject of psychology, completely ousting the older, ambiguous philosophical concepts of mind, soul, and spirit.[287] Then in 1935, Jung was bold enough to call psychology the 'science of consciousness' in the first of a series of five lectures he gave on the theory and practice of analytical psychology to the Institute of Medical Psychology (Tavistock Clinic). He added, "[Psychology] is the science of what we call the unconscious psyche," a science that he said had not yet left the cradle.[288] Indeed, as Jung wrote in the introduction to *Psychology and Alchemy* in 1944, the proper domain of psychology must embrace all aspects of our inner worlds, including religious experience, not projected outwards, as is customary in the West.[289]

Even psychologists are unaccustomed to this practice, for, as the entry for 'concept' in *The Oxford Companion to the Mind* states, "In psychology, concepts of mind must be invented or discovered, much as in physics, for we cannot see at all clearly into our own minds by introspection."[290]

For myself, in an attempt to find a suitable language in which to map the noosphere within the Numinosphere, I have been using the model depicted on the next page for many years. This diagram provides another simple way to depict the relationship of the Numinosphere, as Consciousness, to the noosphere, where the mind functions. We can see why Consciousness is so named from its root, which is Latin *cum* 'together with' and *scīre* to know', from PIE base **skei-* 'to cut, split', also root of *schizoid* and *science*, *scīre* meaning in this latter case 'to separate one thing from another, to discern'. So the much sought-for science of consciousness is actually an oxymoron, for it is the purpose of science to separate



through analytical methods. In contrast, art is a synthesizing activity, putting back together what science has divided, for *art* derives from Latin *ars* 'skill, way, method', from PIE base **ar-* 'to fit together', also root of *coordinate*, *reason*, *read*, *harmony*, *order*, and *arithmetic*.

Intelligence, the eyesight of Consciousness, on the other hand, derives from Latin *intelligentem*, present participle of *intellegere* 'to see into, perceive, understand', from *inter* 'between, within' and *legere* 'to bring together, gather, pick out, choose, catch up, catch with the eye, read'. So, Intelligence, in the way I use the word, is the ability to read between the lines, to see the patterns of relationships between data elements as much as the elements themselves, grounded on and lit by the Coherent Light of Consciousness.

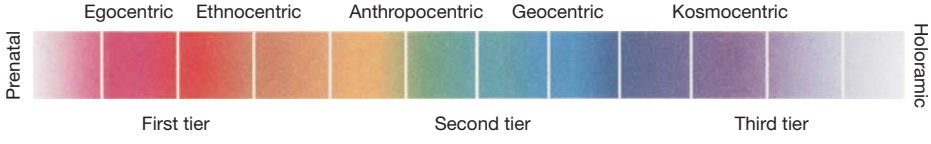
This is what makes Intelligence so dangerous to the ruling authorities. Intelligent people can see what politicians, priests, and educators don't want them to see, for this threatens their ability to control the people. Accordingly, academics in schools and universities try to stultify our innate intelligence by stimulating the development of the intellect, generally out of contact with Reality.

The spectrum of consciousness

Given this confused etymological history, it is not surprising that Wikipedia lists no fewer than fifty-six subdisciplines of psychology, with nineteen psychological schools ranging from behaviourism, which denies the existence of mind and consciousness, to depth psychology, which admits the unconscious into psychology.

There is thus clearly a need to integrate all these different schools of psychology into a coherent whole, even though Panosophy provides a synthesis of all specialist disciplines of knowledge. As far as I can tell, Ken Wilber has made the greatest contribution to this endeavour with his comprehensive spectrum of consciousness, from his first book on the subject in 1977 titled *The Spectrum of Consciousness* to *Integral Spirituality*, published in 2006.

In this latter book, Ken provides a great synthesis of many models of human development, including those of Jean Piaget, Aurobindo Ghose, Clare Graves, Don Beck, Robert Kegan, Jean Gebser, Jane Loevinger, and James Fowler, showing that we human beings develop through various levels and tiers of consciousness, reaching a maximum according to our lights, a maximum that incorporates all the earlier levels, simplified and modified here from a diagram in the *What is Enlightenment?* magazine from 2007.[291]



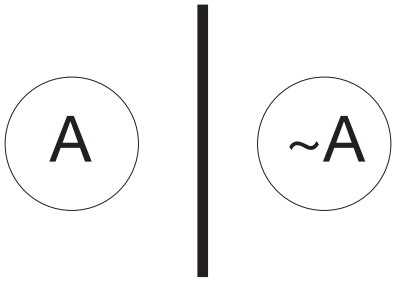
It is a very helpful model, despite its weaknesses. In particular, it does not include the pre- and perinatal domain, as Stanislav Grof points out in an article in *Ken Wilber in Dialogue*.[292] For instance, in the Preface to *Integral Life Practice* from 2008, which Ken describes as a 'second-tier practice', he says, "Developmental models are in general agreement that human beings, *from birth*, go through a series of stages or waves of growth and development." [my emphasis][293] This is a serious omission, for prenatal traumas, which lead to what Grof calls the 'bad womb',[294] and perinatal traumas, can have both a positive and negative effect on later development, as I know from my own experience.

Secondly, all these levels and tiers of consciousness are products of the categorizing mind, which are illusions, as abstractions from Consciousness. These apparent levels act like filters, inhibiting us from seeing the Formless Whole, the Contextual Foundation for all these partial views of consciousness. To see the entire spectrum requires the undivided Supermind acting with Superintelligence lit by Superconsciousness. This Holoramic perspective is actually aperspectival, for, as Jean Gebser wrote in the splendidly titled *The Ever-Present Origin*, "The aperspective consciousness structure is a consciousness of the whole, an integral consciousness encompassing all time and embracing both man's distant past and his approaching future as a living present."[295]

In my experience, such a Holoramic viewpoint arises when the dying, apophatic path of *via negativa* and the growing, kataphatic path of *via positiva* converge at the Alpha-Omega point of involution and evolution. This is like standing on the summit of the mountain of all knowledge, but at once, resting in Stillness at the bottom of the Ocean of Consciousness, depicted in this photograph of Hardanger Fjord in Norway. The mountains here are close to Hardangervidda, a vast mountain plateau, representing the Pathless Land. In the fjord, they are around 1000 m high, plunging into the sea 1000 m deep, magnificently mirroring the Cosmic Psyche.

Regarding the spectrum of consciousness itself, while it mainly concerns individual development, as none of us is ever separate from any other, it can also be viewed in social terms, for our cultural environments influence our learning and behaviour as much, if not more, than the creative energies that emerge within us from the depths of the Cosmic Psyche. Entire groups can hold back development through consensual thought because of their collective and cultural conditioning or change together when the time is right. Indeed, looking at the entire lifespan of our species from conception and birth to death, ontogeny and phylogeny recapitulate each other and the Cosmogonic Cycle; they cannot be separated. However, as the various levels indicate, not everyone is aware of this both-and Big Picture. Most significantly, Western civilization, which still dominates the world through the global economy, has reached an evolutionary cul-de-sac.

We can see this most clearly in the first tier, which is essentially dualistic, with a barrier between opposites, depicted here. At the lowest level is an egocentric identity, where the emphasis is on our unique bodies and minds. At this level, there is a tendency to be identified with one pole, regarding its opposite as hostile, a proclivity that can extend into all the other levels of consciousness at times.



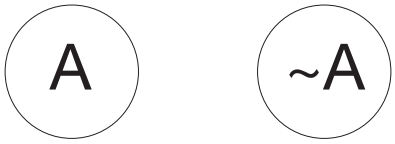
Our dualistic behaviour is most obvious when countries go to war. When each country believes that God is on their side, they are unable to see the point of view of the

people they regard as the enemy. An obvious example of this is the phrase, "God bless America," with which American presidents often end their speeches. Why not "God bless everybody"? Doesn't everyone on this planet deserve God's blessings, whatever they might be?

Such statements are actually a symptom of the next ethnocentric level, such as that shared by nations and religions, such as Chinese and Christianity. The vast majority of humankind live predominantly at this level of consciousness, which is why democracies are limiting, attempting to inhibit the rest of humanity from developing into the second and third tiers. As Alexis de Tocqueville pointed out in *Democracy in America* in the middle of the nineteenth century, democracies are the tyranny of the majority or masses,[296] as tyrannous as the despotic forms of governance that they are intended to replace, a critical situation that John Stuart Mill further explored in *On Liberty*. As he said:

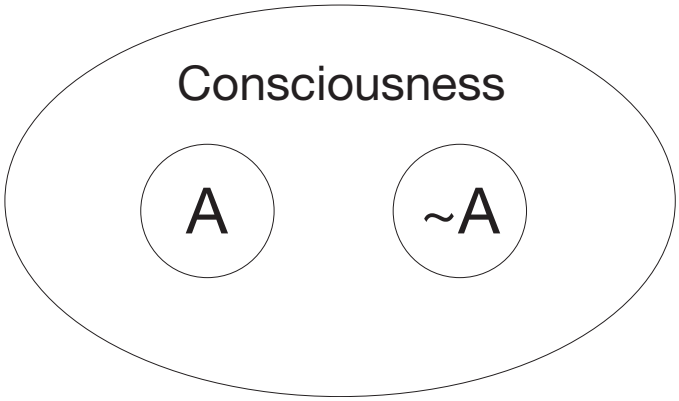
> In general, opinions contrary to those commonly received can only obtain a hearing by studied moderation of language and the most cautious avoidance of unnecessary offence, from which they can hardly ever deviate even in a slight degree without losing ground, while unmeasured vituperation employed on the side of the prevailing opinion really does deter people from professing contrary opinions and from listening to those who profess them.[297]

In the second tier, which Ken calls worldcentric,[298] we move from dualism to duality, where opposites sit side by side, illustrated here. It is here that intelligent behaviour begins to appear, for intelligence is the ability to see both sides of a set of circumstances, superintelligence emerging when we see both sides of *any* and *all* situations.



However, it would perhaps be better to call this tier *mundocentric*, from the Latin *mundus* 'world', cognate with *mundane*. We can see different levels of identity here too. When we identify with *Homo sapiens sapiens* to the exclusion of the other species, we can call this an anthropocentric identity. Then there is the mechanistic identity that some share with stored-program computers as knowledgeable, information-processing beings.

Broadening further, we also have a geocentric identity that we share with the other animals, living beings, and even rocks as earthlings dwelling on our beautiful planet Earth. The ecology movement lives mainly at this level, looking at the biosphere more in its relationship to the other spheres surrounding our planet than in its relationship to the noosphere and Numinosphere.



Scientifically, economically, and psycho-spiritually, it helps to see the second tier as the midpoint between the first tier and the teleological third tier, pulling us Home to the Nonmanifest Absolute. It is here that we realize that Nondual Consciousness is all there is, embracing all opposites, as this diagram illustrates.

As the second tier in the awakening of intelligence is in transition from the first to the third tiers, it presents a pretty complex picture. Any generalizations we might make about the transformation of culture and consciousness taking place in this tier can seem unduly simplistic. Nevertheless, I feel that there are some observations we can make that many would agree with.

First, there is a general recognition that a revolution in science is currently taking place, far more radical than any previous scientific revolution. For instance, in 1986, Willis Harman, then president of the Institute of Noetic Sciences (IONS), described this vision in these words:

> Most educated people in this country [the USA] would think it pretty preposterous to suggest that the change that is taking place is at as deep a level as the change that took place during the Scientific Revolution, because that would imply, of course, that the near future—the early part of the next century—would be as different from present times as present times are from the Middle Ages."[299]

The central issue here is the recognition that Consciousness is the primary reality, not the physical universe, transforming the second pillar of unwisdom into the corresponding pillar of wisdom. However, in *Global Mind Change*, Willis Harman hedged his bets, defining three metaphysical perspectives: M-1, in which matter gives rise to mind (materialistic monism), M-2, in which matter and mind coexist as two fundamentally different kinds of stuff, à la Descartes (dualism), and M-3, in which the ultimate stuff of the Universe is recognized as consciousness, mind thus giving rise to matter (transcendental monism).[300]

We saw a similar situation during the first scientific revolution. In between the geocentric view of Aristotle and Ptolemy and the heliocentric view of Aristarchus and Copernicus, Tycho Brahe developed a compromise in which the inner planets revolve around the Sun, while the Sun, Moon, and outer planets revolve around the Earth.[301]

Marilyn Schlitz, IONS President Emeritus, is following in Willis Harman's footsteps, saying, in a One-Minute-Shift video on the Web:

> When Copernicus proved that the Earth revolves around the Sun, he literally changed the world as we knew it. Darwin and Einstein did the same in their day. What if we are now going through the next scientific revolution, one every bit as profound? For centuries, science and religion have been at odds. Science has focused on the physical, denying the reality of what most religions believe. However, today's science is showing that some spiritual insights are actually scientific truths; that psychic abilities may be real; that we are all fundamentally interconnected; and that we all have innate abilities to heal and transform ourselves. Science and technology without wisdom can endanger life as we know it. But when we marry the best of science with the best of our wisdom traditions, humanity will have the capacity to create a more just, compassionate, and sustainable future.[302]

Then on 20th July 2013, Stephen Dinan, founder of the Shift Network and formerly IONS Director of Membership and Marketing, convened a teleseminar titled 'The Next Scientific (R)evolution The Emergence of the Akashic Paradigm with Consciousness at the Core', with Ervin Laszlo, Ken Wilber, Barbara Marx Hubbard, Riane Eisler, and Duane Elgin.

As Ervin Laszlo said, we need to give up the idea that the world is a giant mechanism. Rather the Universe is "most like an Internet, a kind of Cosmic Internet. What you know about this information system, which we call the Internet, all things are somehow connected. You can reach any and all items on the Internet from any and all points. And they all hang together somehow." Indeed. When we look at the Universe and hence society as an information system, as this book outlines, we can complete today's revolution in science.

However, this is much more far-reaching than the term *paradigm shift* indicates, most popular today. In *The Structure of Scientific Revolutions*, Kuhn used the terms *paradigm change* and *paradigm shift* twenty-three and six times, respectively,[303] to denote such revolutions in worldview and scientific practice, when we learn to see a new gestalt.

But Consciousness is not a Gestalt, meaning 'shape, form' in German. For Consciousness, as the Formless Absolute, even beyond the structured Numinosphere, is not a paradigm, from Late Latin *paradigma* 'pattern, exemplar, example'. Rather, what we are engaged in today is a contextual inversion, depicted in the diagram on page 10, which is only fully realized in the third tier of intelligence and consciousness, where the split between mysticism and science is fully healed.

Economically, there is widespread recognition that the global economy is inherently unstable and unsustainable for very much longer. However, there is very little consensus on what could replace the monetary economies of capitalism and communism, on what will happen when the global economy self-

destructs in the not too distant future. The major stumbling block is that money is the primary immortality symbol in the world today, as mentioned on page 31. And until this critical situation is honestly and openly addressed, there is very little chance of cocreating the Sharing Economy, recognizing that the appearance that we are separate from each other is an illusion.

Psychospiritually, the greatest inhibitor to Full Awakening is the spiritual ego. As Chögyam Trungpa writes in *Cutting through Spiritual Materialism*, "Walking the spiritual path properly is a very subtle process; it is not something to jump into naively. There are numerous sidetracks which lead to a distorted, ego-centred version of spirituality; we can deceive ourselves into thinking we are developing spiritually when instead we are strengthening our egocentricity through spiritual techniques. This fundamental distortion may be referred to as *spiritual materialism*."[304]

The central issue here is that once we glimpse or taste the Absolute, life is never the same again. The experience of enlightenment, however brief, is so fantastic that it makes us feel special. Yet, as Jack Kornfield points out, "Although the experience is special, it does not happen to a special person." If we are to be fully awake, we need to be free of the sense of a separate self. Not that this is easy, for while it is quite possible to awaken into a state of timeless grace, in oneness with the Divine, with unbounded freedom and joy, such experiences do not last. As he says, "After the ecstasy comes the laundry," as we face the day-to-day task of translating that freedom into our imperfect lives.[305]

We can illustrate the challenges we face as human beings with the myth of Pandora's box. Hesiod tells us that when Epimetheus married Pandora, the first woman, she was overcome with curiosity about her husband's large earthenware pot, covered with a lid, containing all evils and one good: hope. She lifted the lid, releasing all the evils, but before hope could also be released, she replaced the lid.[306]

This allegory well describes why even when we open the lid on our unconscious just a little, we so often shut it tight again before we reach the bottom, where the rewards of bringing our entire past—our collective, cultural, and personal unconscious—into the brilliant light of day are to be truly found. As an acquaintance of mine once said to me when I asked her why she did not look inside to discover why she was so unhappy, "I'm afraid of what I might discover."

What is left behind when we close the lid before we have completely examined the depths of the psyche has been given many names. For instance, Jung called it the shadow[307] and Eckhart Tolle the pain body.[308] In popular culture, many refer to the inner demons that drive our lives. The great challenge here is that what we don't want to look at often presents us with a precarious sense of security in life. So it tends to be protected and defended as if one's life depended on it. And when two people meet with similar shadow patterns, there is a tendency to project what one does not like in the subconscious on to the other, accusing that supposed other of projecting their own pains on to the originator of this game in a never-ending cycle. Such behaviour patterns are symptoms of pathological first-level, dualistic thinking, which can be resolved in the second tier when the Nondual Intelligence and Consciousness comes into play from the third tier, breaking this apparently unresolvable cycle.

Now for this to happen on a global scale, each of us, as individuals, need to take responsibility for the entire evolution of the whole human race, as Andrew Cohen pointed out in *Freedom Has No History* in 1997. As he says, "To succeed, we must be prepared to do battle with the powerful conditioning, conscious and unconscious, of the whole race. That means we have to come out from the shadows and be seen. Like Atlas, we have to be willing to hold up the whole world on our shoulders. It's an awesome task."[309] In the metaphor of Pandora's Box, if we have the courage to bring the entire unconscious of the

human race into consciousness, what we reveal is not hope, but Nondual Love, which has no opposite, no object to love.

The Tower of Babel provides another metaphor for the transition from the second to the third tiers of consciousness. In the Bible, this tower is built in an attempt to reach heaven, which God frustrated by making its builders speak different languages so that they could not understand one another.[310] However, we can also see the Tower of Babel as representing the entire world of learning during the past several thousand years, a very confused picture, very far from being in universal order.

Indeed, the world of learning is in such a gigantic mess that we really have no alternative but to demolish the entire edifice, rather like a tsunami in which everything is destroyed, as in Aceh province in Sumatra in December 2004. In the path of *neti neti*, the structure is left in ruins, as we reach Oneness with No-mind. However, in the affirmative spiritual approach, to return Home to Wholeness, we need to rebuild the entire world of learning on the seven pillars of wisdom, recognizing that none of us is separate from God, Nature, or any other being for an instant.

However, even among those who are endeavouring to live in the third tier in the spectrum of consciousness, there is some confusion between the evolutionary and involutionary processes that can take us there, sometimes conflating the two. Furthermore, the challenge of living simultaneously in the third tier and the prevailing dysfunctional society is so challenging that very few have managed to complete steps sixteen and seventeen in Joseph Campbell's three stage model of the spiritual path, outlined in the table on page 23.

The two main instigators of this third tier, Andrew Cohen and Ken Wilber, call it cosmocentric[311] and kosmocentric, respectively, meaning "an identification with all life and consciousness, human or otherwise, and a deeply felt responsibility for the evolutionary process as a whole … an emergent capacity, rarely seen anywhere".[312]

However, we can enter the third tier as much through a dying involutionary process as a growing evolutionary one. In *Sex, Ecology, Spirituality* from 1995, Ken took the former approach in a chapter titled 'The Depths of the Divine', calling the four levels of the third tier 'Psychic', 'Subtle', 'Causal', and 'Nondual'.[313] However, in *Integral Spirituality* in 2006, he calls these levels 'Illumined Mind', 'Intuitive Mind', 'Overmind', and 'Supermind'. So while in his early studies of the further reaches of human consciousness, Ken has focused attention on *via negativa*, on the downward involutionary movement in the vertical dimension of time, in his later writings, he is more focused on the upward evolutionary movement, the affirmative path of spiritual awakening.

Conflating the two fundamental paths of spiritual awakening happens when we follow Aurobindo's confused notions of evolution and involution, mentioned on page 8. To take a Holoramic perspective, viewing the four spheres in the Great Chain of Being in the Eternal Now, it is essential to distinguish these two paths before they can be reunited in Love, Peace, and Stillness at the end of time, free of existential fear.

Such fears are not only personal, relating to the inevitable deaths of our body-mind-soul organisms, often taking longer than the threescore years and ten in the Bible, but not that much longer. They are also cultural, with the imminent death of Western civilization and the global economy, and collective,

with the eventual extinction of our species. Our cultural and collective existential fears exist because we live in a world that is out of touch with Reality, with the Immortal Ground of Being that we all share.

As none of us is ever separate from any other being, we also share these cultural and collective fears, which are the greatest inhibitor to healing the deep split between mysticism and science, a major purpose of this book. For to realize our fullest potential as a species, it is essential to let go of attachment to money and to our collective identity as human beings, something that very few are yet ready to do.

Cognitive science

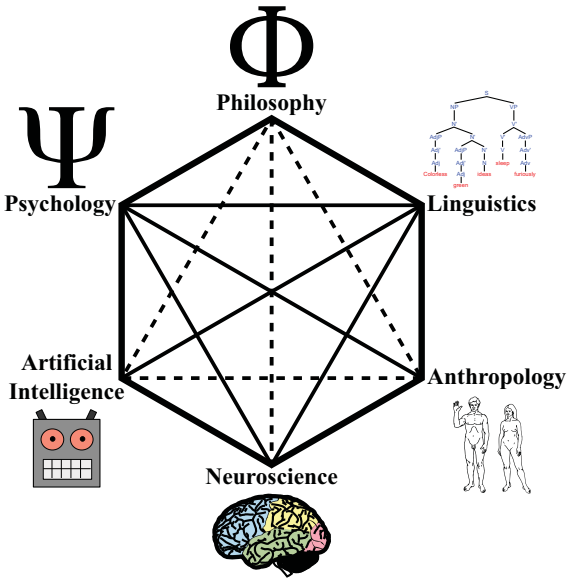
One way to address these widespread, deeply rooted fears as courageously as possible is to recognize that the software and data in computer systems, as extensions of the mind, are as much a part of the noosphere as the corresponding cognitive structures in humans. For the invention of the stored-program computer in the late 1940s has recently led to an increase in existential fear in the mainstream press, faced with the prospect of superintelligent machines[314] with artificial general intelligence (AGI)[315] taking over the world, making humanity redundant.

It's nonsense, of course, for anyone who has looked deeply inside themselves and so found the Divine Source of Life. But, as far as I can tell, none of the scientists engaged in these research activities has done so. For if they had, they would realize that it is absurd to try to build machines that are more intelligent than they have the potential to be.

However, when I wrote my first computer program in September 1964 to calculate the roots of a quadratic equation I did not know this, being out of touch with Reality. In the event, it was not until 1980 that my experiences told me that AGI is impossible, this book on *The Four Spheres* being the culmination of a long series of writings explaining cognitively and rationally why this is so. So maybe it would be useful to others to review a little of what I have learnt in this voyage of discovery.

In the 1950s, cognitive scientists, attempting to make sense of the epoch-making computer, believed that they were on the threshold of making the greatest breakthrough in human learning since the ancient Greeks. However, it was not until the 1970s that the various disciplines that were to form cognitive science came together. The trigger was the Alfred P. Sloan Foundation, which wished to invest a considerable amount of money in a scientific project that would stimulate significant progress in understanding the relationship between the brain and the mind.[316]

However, when the psychologist George A. Miller learned of this project, he suggested that artificial intelligence was just a part of a much bigger movement, which needed to include psychology, linguistics, neuroscience, computer science, anthropology, and philosophy. As he said, "I saw psychology, linguistics, and computer science as central, the other three as peripheral." The Sloan Foundation accepted this proposal, and in 1978 a dozen leading scholars drafted a State of the Art Report (SOAP), which included a sketch of the six constituent fields, called the cognitive hexagon, depicted in this diagram. The unbroken and broken lines indicate strong and weak interdisciplinary ties.[317]



However, once again, as cognitive science does not recognize the existence of the Numinosphere and noosphere, as it stands today, this multidiscipline can as much inhibit as enhance our understanding of the human mind and consciousness.

The greatest benefit is to link psychology to anthropology, as the science of humanity. This relationship is vitally important for studying the noosphere, for anthropology can help us understand our species when our forebears were still in touch with the Absolute and Nature, before the introduction of written language, after which the analytical mind took our species further and further away from Reality.

Of course, it is vitally important in these studies not to conduct them through the filters of the Western mind, which tend to distort our perceptions of the world we live in. Indeed, even when we have the historical record, from the ancient Greeks, for instance, exploring "the evolution of the Western mind places special demands on both reader and writer, for it asks us to enter into frames of reference that are sometimes radically different from our own," as Richard Tarnas begins the Introduction to *The Passion of the Western Mind*.[318]

This leads us to philosophy, which Bertrand Russell described as lying in the No-Man's Land between the warring factions of science and theology,[319] using a metaphor from the First World War, which so appalled him as a pacifist. The reason why this No-Man's Land exists is because these two principal ways of seeking the Truth have incompatible contextual contexts, as I discovered as a seven-year-old. So when we recognize the Absolute as the Divine Cosmic Context, science and theology are unified in Panosophy, and philosophy, as a distinct discipline, is squeezed out of existence. We can then address the perplexing paradoxes that have puzzled philosophers through the ages with sound mystical experience and rational thought.

At the opposite end of the spectrum, so to speak, is neuroscience, which played a key role in the foundation of cognitive science. For having recognized that behaviourism, which dominated psychology in the 1920s to 1940s, had reached an evolutionary dead end, cognitive scientists still needed to establish their new discipline as sound science, based on materialism. However, neuroscience properly belongs in the biosphere, near the surface of the Numinosphere, viewed finitely. Specifically, the mind and brain are both concepts, which can only really be understood when the concept of concept, the central concept in psychology, is understood in the noosphere.

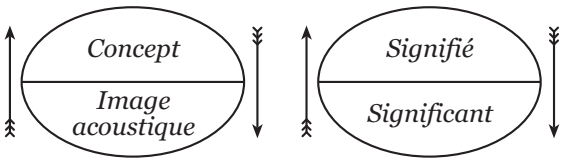
This brings us to linguistics, 'the scientific study of language and its structure, including the study of grammar, syntax, and phonetics'. It is often said that our ability to communicate in languages is the most important feature that distinguishes humans from the other animals. While this may be so, computers are also symbol-processing machines. So our linguistic abilities cannot be what distinguish humans from machines.

Meaning triangle

To understand this distinction, we need to study semiotics, as the science of signs, which is closely related to structuralism, embracing both linguistics and anthropology within its purview. As Terence Hawkes points out, "To be human … is to be a structuralist."[320] And as Jean Piaget pointed out in his classic work on the subject, one unifying feature of structuralism is wholeness, the internal coherence of the field being studied.[321]

Regarding linguistics itself, the diagram on page 61 illustrates Noam Chomsky's transformational grammar with the sentence, "Colourless green ideas sleep furiously." As he points out, this sentence is grammatically correct, but semantically it is meaningless.[322] Why is this?

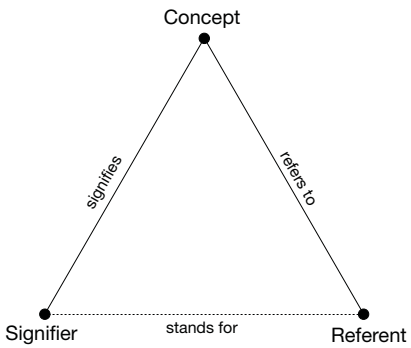
Well, Ferdinand de Saussure and Charles Sanders Peirce, the founders of semiotics around the turn of the twentieth century, provide clues why this is so. Beginning in Europe, we first need to look carefully at our maps, for they exist in two forms, as concepts and as words, sounds, and other signs that denote them. This is a distinction that Ferdinand de Saussure made in *Cours de linguistique générale*, which his students published posthumously in 1915. In this seminal book of structural semiology, as semiotics was known in Europe at the time, de Saussure said: "I propose to retain the word *sign* [*signe*] to designate the whole and to replace concept and sound-image respectively by *signified* [*signifié*] and *signifier* [*signifiant*]," illustrated in this diagram.[323]



For instance, the concept of  , as a mental image, could be represented by *tree*, *träd*, *arbre*, or *Baum* in English, Swedish, French, and German, respectively. No matter which language we use to express our ideas, we all have much the same understanding of the concept of tree, although there are some fuzzy edges, as there are with many concepts. Similarly, we could have the number three in our minds as the signified, where the signifier, such as 3 or III, is called a numeral. This distinction between numbers, as concepts, and numerals, as signifiers, is something that computers cannot make. Both concepts and the signifiers that represent them need strings of bits to denote them. This is the simplest way of proving that humans are not machines and hence that technological development cannot drive economic growth indefinitely, requiring a radical change in the work ethic that has governed human affairs for thousands of years.

However, what de Saussure omitted in his dyadic view of signs was a representation of the territory being mapped. To obtain a complete picture, we need to adapt Peirce's triadic view of semiotics, which is not easy to follow because what he published on the subject in his lifetime is rather confused. The clearest statement of his semiotics is contained in an unpublished fragment he wrote about 1897, first partially published in the second volume of his *Collected Works* in 1932. In the first paragraph, Peirce wrote, "Logic, in its general sense, is, as I believe I have shown, only another name for *semiotic*."[324] Then in the second paragraph, he wrote, "A sign … addresses somebody, that is, creates in the mind of that person an equivalent sign, or perhaps a more developed sign. That sign which it creates I call the *interpretant* of the first sign. The sign stands for something, its *object*."[325]

This triadic approach to semiotics is illustrated in what J. F. Sowa of IBM calls the 'meaning triangle' in *Conceptual Structures*,[326] inspired to do so by *The Meaning of Meaning* by C. K. Ogden and I. A. Richards, who learned about Peirce's semiotics in England from Victoria, Lady Welby, who had corresponded extensively with Peirce after he favourably reviewed a book she had written titled *What is Meaning?*[327]



What this diagram illustrates is that there is an indirect relationship between language and the territory that language describes, not generally recognized by modern academic philosophers, focusing more attention on language than on the conceptual structures underlying language.

But things get a little more complicated when we recognize that referents do not just denote our external worlds as the territory. The territory also includes the maps we create of this outer world. So

referents can also be both concepts and the signifiers that represent them. Theories do not exist 'out there' in printed and electronic form. As David Bohm pointed out in *Wholeness and the Implicate Order*, which unified quantum and relativity theories, "The word *theory* derives from the Greek *theoria*, which has the same root as *theatre*, in a word meaning 'to view' or 'to make a spectacle'. Thus it might be said that a theory is primarily a form of *insight*, i.e. a way of looking at the world, and not a form of *knowledge* of how the world is."[328]

The fact that there is a primary-secondary relationship between concepts and the signs that represent them is well illustrated by a famous letter that Albert Einstein wrote in 1945 to Jaques Hadamard, who was then conducting a survey of some of the leading mathematicians of his day into how they develop their ideas. Einstein wrote:

> The words or the language, as they are written or spoken, do not seem to play any role in my mechanism (sic) of thought. The physical entities (sic) which seem to serve as elements in thought are certain signs and more or less clear images which can be 'voluntarily' reproduced and combined.
>
> There is, of course, a certain connection between those elements and relevant logical concepts. It is also clear that the desire to arrive finally at logically connected concepts is the emotional basis of this rather vague play with the above mentioned elements. But taken from a psychological viewpoint, this combinatory play seems to be the essential feature in productive thought—before there is any connection with logical construction in words or other kinds of signs which can be communicated to others.
>
> The above mentioned elements are, in my case, of visual and some of muscular type. Conventional words or other signs have to be sought for laboriously only in a secondary stage, when the mentioned associative play is sufficiently established and can be reproduced at will.[153]

Here, Einstein introspectively describes the creative processes taking place in his inner world, a territory that lies outside the domain that scientists conventionally study. Nevertheless, the description well illustrates the way that our original thoughts emerge from the Origin of the Universe at the centre of the Numinosphere, first appearing in the noosphere as vague mental images before they become sufficiently clear to be expressed in words, mathematical notation, and in graphical diagrams, such as mathematical graphs and semantic networks.

Liberation from our mechanistic conditioning

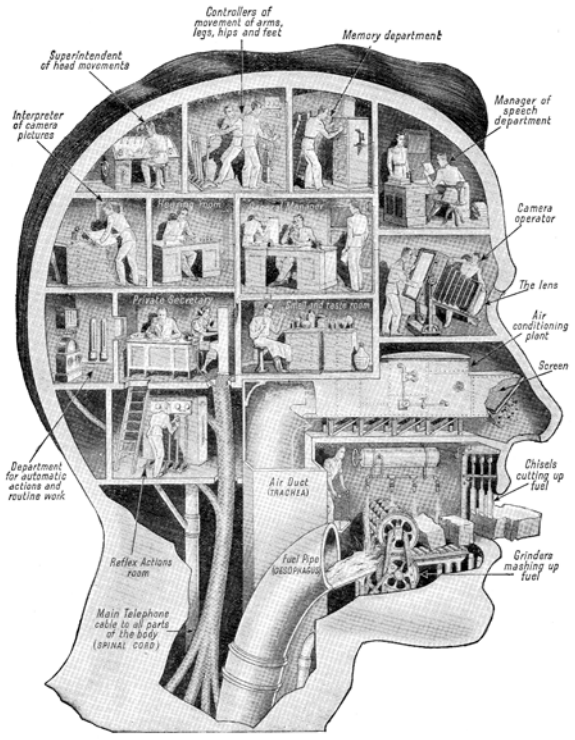
Regarding the sixth element in cognitive science, why do computer scientists still persist in claiming that they are on the threshold of creating machines with artificial intelligence, surpassing any level of intelligence that we humans might aspire to? Well, the simple answer is that they seem to believe in the scientific paradigm that the universe is a machine and hence that human beings are nothing but machines. In that case, there is no reason to suppose that computers could not surpass human intelligence one day, effectively creating a quite new species, the prospects for which we explore in the section beginning on page 121.

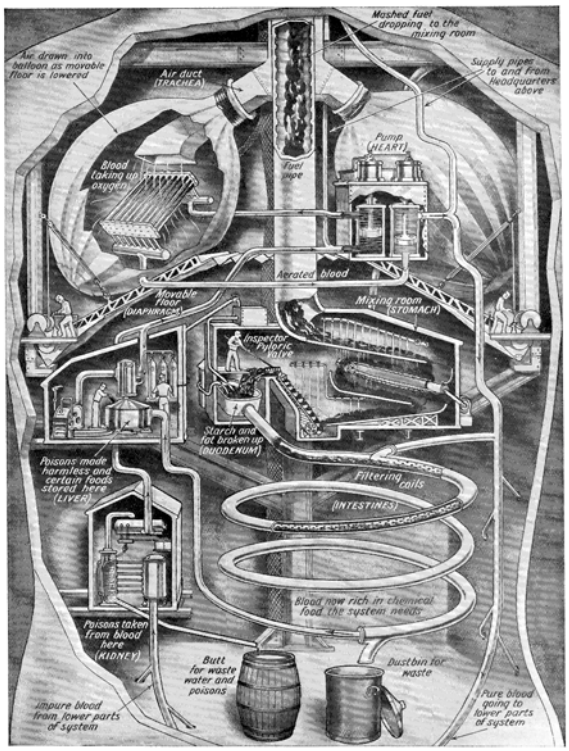
We can trace the erroneous belief in a mechanistic universe to René Descartes' *Meditations on the First Philosophy in which the Existence of God and the Real Distinction between the Soul and the Body of Man Are Demonstrated*, published in 1641 in Latin. Comparing the human body, as a machine, consisting of bones, nerves, muscles, veins, blood, and skin, to a clock, made up of wheels and counterweights, Descartes thought that the body would move mechanically, like such a clock, even though it had no mind in it.[329] He based this mechanistic worldview on the separation of mind and body. As he said, "I am only a thinking and unextended being … entirely and truly distinct from my body, and may exist without it."[330]

As a consequence, one of the fundamental principles of scientific knowledge is that predictions can be made on the assumption that the future is like the past. This may be true of the solar system, for reasons that Kepler and Newton demonstrated in the seventeenth century. But this mechanistic worldview is not

generally applicable, not the least because in five to six billion years time, the Sun is destined to turn into a red giant and white dwarf,[331] and there will be no one around to observe the movements of the planets or 'wandering stars'. Furthermore, scientists cannot explain what causes spontaneous creativity, for such unpredictable events lie outside science as it is conceived today.

The Miracle of Life, published in 1938 and edited by Harold Wheeler, used different metaphors for mechanical humans, which I learned about when I was a teenager in the 1950s from one of my father's books. Before the Second World War, scientists likened the various parts of the head to a telephone exchange and the body as a whole to a chemical factory, illustrated here.[332]





But today, we can use the stored-program computer as a metaphor for a machine, with the hardware and software corresponding to our brains and minds, respectively, which Descartes thought could exist separately. This divisive view gave rise to the split between *res cogitans* 'thinking substance, mind, or soul'[333] and *res extensa* 'extended substance', by which Descartes meant an object with breadth, width, and height occupying space.[334]

Indeed, even the hardware and software in computer systems cannot be separated, as long as we remember that it is the software that determines how computers function not the hardware. For as Andrew S. Tanenbaum wrote in *Structured Computer Organization*, "*hardware and software are logically equivalent*," written in italics to emphasize the central theme of his book. Despite Descartes' determination to separate body and mind, computer hardware and software form a continuum. Whether a particular function is implemented in hardware or software is concerned with practical issues like cost, speed, memory, and flexibility.[335]

However, it is not easy to communicate a vibrant, life-enhancing worldview to scientists holding on tightly to dogmatic, deeply entrenched cognitive structures, which give them a sense of identity in the world. Even though it is quite possible to change our minds, it often appears that our habits of thought are unchangeable, as if they have been built into the circuitry of the brain. Indeed, it is quite possible for the brain, as a living being, to be rewired through a process called neuroplasticity, as Barbara Arrowsmith-Young[336] and Jill Bolte Taylor[337] describe in their own experiences. There are even some

cases of hemispherectomy, in which children have half a brain removed in order to control severe intractable epilepsy.[338]

On the other hand, mystics and spiritual seekers do not need the many proofs included in this book that a computer can never program itself to solve the ultimate problem of human learning. For they intuitively know this from their own direct experience garnered by conducting experiments, such as self-inquiry and a multitude of meditation and yoga techniques.

This situation has presented me with considerable communications challenges over the years. In a world of specialists, who is interested in healing the split between mysticism and science? Well, in between these two extremes there is a middle ground. For there are many who are agnostics on the central issue of human existence, as I was when I began my career in the information technology industry. It is these agnostics to whom I am endeavouring to communicate, for as one friend, who was both a spiritual seeker and web designer, once said to me, I have the ability to put into words what he already knew in his own experience, which is paramount. So maybe it would help to narrate a little more about my life experiences.

In my first job in the mid 1960s as a mathematician/programmer in the research and development department of the Central Electricity Generating Board (CEGB), I wondered a little about the relationship of computers to humans. However, my thoughts did not go very far. Having been educated and brought up within a culture that felt alien to me, I was psychologically shattered, with almost no confidence and self-esteem. So my top priority in those days was to learn my trade and begin to develop fruitful relationships with colleagues and friends.

Regarding computers, I had very little idea what a computer is, not the least because the second-generation, transistor-based IBM 7094 that we were using was three kilometres away from our office, on the other side of the River Thames from the City of London. In those days, we would write our programs on 80-column sheets of paper, which people, mainly women, then transferred onto cards with the ubiquitous 029-Keypunch, rather like a typing pool. Our boxes of cards were then driven at half-hourly intervals by limousine to the computer located in Victoria, which I visited just once, the only time I actually saw a computer in my first three years as a programmer.

If we were lucky, we would get the results back the same day, but when the machine was heavily loaded or was broken down, this would sometimes take two or three days, plenty of time to learn a little about the computer science that lay beneath the surface that we were programming at. One thing that sparked my interest was the human-computer interface. When CEGB upgraded its computer to a third-generation IBM Systems 360/75—the first with integrated circuits—sometimes the only diagnostic we would receive to a failed execution of our Fortran programs was a string of incomprehensible hexadecimal digits out of context. How stupid could this be? I asked myself. I wonder what today's software developers typing their programs directly into integrated development environments (IDE) would make of this comparatively early experience with computers.

In this first job, my first thoughts on the prospects of artificial intelligence is that computers are very good at arithmetic but rather poor at pattern recognition, while with humans the situation is the other way round. But I did not understand why, knowing little about psychology, in general, or my own psychodynamics, in particular.

In the event, it took me over thirty years to understand the difference between humans and computers. The key here is to notice the distinction between the essence of structures and their superficial forms, which can easily be demonstrated with a simple example. The diagram below shows a collection of As in thirty different fonts that I borrowed from CorelDraw, a drawing program that I used when working for IBM in the 1990s in Stockholm. We humans can see that there is a certain 'A-ness' about these characters, which enables us to see the commonality amongst them, different as they are. However, when I ran an experiment in 1998 to see how many of these As my optical character recognition (OCR) program called OmniPage would recognize, it managed only twelve: 40%.

Tidying up some loose ends in order to find a sense of closure with my life's work, in July 2015 I repeated this experiment, aligning the characters in six rows of five to make it easier for the OCR program I was using. The text recognition function of Adobe Acrobat Pro Version 11 recognized eleven as clean As, with another four as As with embellishments, effectively 50% this time. It incorrectly interpreted ten of the remaining fifteen, returning no result for the other five.

The reason why we humans can recognize these glyphs as the letter A is because they have a deep underlying essence, which resonates with our understanding of what the letter A looks like. We can immediately see forms as wholes, without any need for pattern recognition algorithms, which computers must resort to.

As it is with simple letters, so it is with human faces, which we are able to recognize without any difficulty, complex as they are. In music, poetry, art, literature, etc., it is the essence of these structures that evoke beautiful feelings within us. They cannot be fully appreciated with the intellect, even though the mind likes to analyse these structures to see how a piece of music, for instance, is composed. Analysing structures destroys their essence, which provides us with meaning and value. The essence of structures is not something that can be quantified in monetary terms, for instance. As the saying goes, "The best things in life are free."

The ultimate structure in the Universe is the Totality of Existence, whose Essence, at the Centre of the Numinosphere, can best be called Love. For when we look deeply into the eyes of people who are totally open and egoically undefended in the moment, the exquisite feeling of Supreme Love arises. When we are psychologically naked in this way, we act as mirrors for each other, revealing the True Nature that we all share. This is most obvious in divine lovemaking with one's beloved, when two apparently separate beings merge into one in Stillness, the most beautiful experiences that I have enjoyed in my lifetime.

Such experiences are so enjoyable, powerful, and undeniable, it is a mystery to me why so many still believe computer scientists when they say that they are about to build machines with artificial intelligence surpassing human intelligence. When I set out in 1980 to develop a cosmology of cosmologies that would unify the psychospiritual and physical energies at work in the Universe, I knew very little about scientists' attempts to create artificial intelligence in computers.

What I found amazed me, for by this time I realized from my own experience that no machine would ever be able to learn in the accelerating way that I was then cognitively developing. The excitement was so intense, I could not conceive of a computer built from sand and bits of metal having similar experiences. So even though Jung said in 1935 that psychology is a science that had not then left its cradle, it was a surprise to learn that Alan Turing boldly asserted just fifteen years later, "I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted."[339]

Turing, the principal founding father of computer science, wrote these words in a famous article for the philosophical magazine *Mind*, which began with these words: "I propose to consider the question 'Can machines think?' " But rather than trying to answer this question directly, Turing proposed an 'imitation game' to test the hypothesis that machines could one day think for themselves.[340] In this Turing Test, a human interrogator asks questions of a computer and a human trying to determine which is which from the answers, as explained in *The Imitation Game*, a biopic about Alan Turing that won the 2015 Oscar award for Best Adapted Screenplay by Graham Moore, adapted from Andrew Hodges' biography *Alan Turing: The Enigma*.

Well, Turing's prediction did not happen. But this has not stopped computer scientists attempting to build computers with artificial intelligence, surpassing any level of intelligence that we humans might aspire to. Marvin Minsky and John McCarthy, among others, laid down the foundations of AI at the Dartmouth Conference in 1956, when the latter stated the fundamental hypothesis of AI as follows: "Every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it".[341] And Herbert A. Simon said in 1960, "I believe that in our time computers will be able to perform any cognitive task that a person can perform."[342]

Then in the early 1960s, the statistician Irving John Good wrote this in 'Speculations Concerning the First Ultraintelligent Machine', available on the Web:

> Let an ultraintelligent machine be defined as a machine that can far surpass all the intellectual activities of any man however clever. Since the design of machines is one of these intellectual activities, an ultraintelligent machine could design even better machines; there would then unquestionably be an 'intelligence explosion', and the intelligence of man would be left far behind. Thus the first ultraintelligent machine is the last invention that man need ever make.

Yes, indeed, we are on the threshold of an intelligence explosion. But this will happen synergistically within the human population at large, despite all the efforts of computer scientists to prove otherwise. More recently, in 1990, the American philanthropist Hugh Loebner agreed with The Cambridge Center for Behavioral Studies in Massachusetts to underwrite a contest designed to instantiate a variation of the Turing Test.[343] He has offered a Grand Prize of $100,000 and a Gold Medal is to be awarded for the first computer whose responses are indistinguishable from a human's. It is suggested that such a computer could be said 'to think'.[344]

Indeed, some claim that machines with artificial intelligence already exist. On 9th June 2014, the *Independent*, *Guardian*, and *Telegraph* newspapers in the UK announced that a super computer simulating

a 13-year-old boy, named 'Eugene Goostman', had fooled 33% of interrogators at the Royal Society that it is human. It was thus asserted that this computer is the first to pass the Turing test.[345] However, it seems that this claim was not recognized for the Loebner Prize in that year.[346]

But what such computer scientists are ignoring is a statement that Ada Lovelace, the daughter of Lord Byron and his wife Anne, a poet and mathematician,[347] respectively, made in 1843. In a brilliant memoir on Charles Babbage's Analytical Engine, the first design for a general-purpose computer, she wrote:

> The Analytical Engine has no pretensions to *originate* anything. It can do whatever we *know how to order it* to perform. It can *follow* analysis; but it has no power of *anticipating* any analytical relations or truths. Its province is to assist us in making *available* what we are already acquainted with.[348]

Babbage called the two main components in his Analytical Engine Mill and Store, terms he borrowed from the textile industry,[349] corresponding to the central processing unit (CPU) and random-access memory (RAM) in modern computer systems—active and passive data, respectively. He envisaged that the instructions needed to operate the machine would be entered on punched cards, like those that Joseph-Marie Jacquard had invented to automatically control the patterns of weaving of cloth in a loom. Indeed, in her memoir on the analytical engine, Ada Lovelace delightfully wrote, "We may say, most aptly, that the Analytical Engine weaves algebraic patterns just as the Jacquard-loom weaves flowers and leaves."[350]

This conception of a computer closely matches my own experiences of using such calculating machines for over half a century. Our experiences differ mainly because the programs that control the functioning of the machine are today stored in its main memory. So to answer the question, "Can machines think?", we need to ask the more searching question, "Could a computer program itself without human intervention?" At the turn of the millennium, I was absolutely certain, both cognitively and experientially, that the answer to this question is a resounding NO!

I had thus ceased to be an agnostic with respect to artificial intelligence. I knew that machines could never be programmed to see what I could see, standing at once on the summit of the Mountain of All Knowledge and resting in the utmost depths of the Ocean of Consciousness, illustrated by the image of Hardanger Fjord on page 56.

I was also no longer an agnostic in the conventional religious sense. Like Jung in 1959, in a televised BBC interview with John Freeman, who asked, "Do you now believe in God?", I could say, "I don't need to believe. I *know*."[351] In *The God Delusion*, Richard Dawkins interprets this statement as that of a 'strong theist', holding a 100 per cent probability of God with blind faith. He then lists seven levels in a spectrum of belief, with agnostic in the middle, ending with a 'strong atheist', saying, "I know that there is no God, with the same conviction as Jung 'knows' there is one."[352]

However, theistic, agnostic, and atheistic attitudes in our relationship to God are not the only possible ones. As Osho said in his discourses, theists and atheists are people who believe and do not believe in God; agnostics are those who do not know what to believe; and Gnostics are those who do not need to believe, for they know the Truth in their own direct experience.[353] *Gnostic* derives from the Greek *gnosis*, 'knowledge, wisdom', cognate with both *know* in English and *jñāna* in Sanskrit, meaning 'spiritual wisdom and illumination, inner knowing of Ultimate Reality'.

Esoteric	Exoteric
Kabbalah	Judaism
Gnosticism	Christianity
Sufism	Islam
Advaita	Hinduism
Zen	Buddhism
Taoism	Confucianism

On this point, it is important to distinguish esoteric and exoteric religions, summarized in this table, although Eastern and Western religions are not directly comparable, being based on the first pillars of wisdom and unwisdom, respectively. What most people think of religions are the organized ones, with their multitude of rituals and beliefs, which we can call exoteric. The esoteric aspect of religiosity, on the other hand, is mystical, sometimes called 'occult' because it is hidden from the five physical senses. For *occult* derives from Latin *occultus* 'secret', participle of *occultare* 'secrete', frequentative of *occulere* 'to cover over, conceal', from PIE base **kel-* 'to cover, conceal, save', also root of *hell*, *hole*, *colour* 'that which covers', and *cell*. This occult understanding is absolutely essential if we are to realize our fullest potential as superintelligent beings, rising far above any level of programming that machines might attain.

By the turn of the millennium, I knew from my mystical experiences, brought about through the most rigorous reasoning, that artificial intelligence is impossible. I could thus explain quite simply why there was an 'AI winter' in the eighties and nineties, as the first flurry of predictions in the fifties and sixties of predictions failed to manifest. So during the 'noughties', the first decade of the twenty-first century, I naturally assumed that computer scientists had abandoned their futile endeavours.

Prospects for artificial intelligence

Not a bit of it. When exploring prophesies for a great spiritual awakening at the winter solstice in 2012, I discovered an article by Peter Russell titled 'A Singularity in Time',[354] which we look at on page 163 in the section on the prospects for humanity. In this article, I learned about a prediction that Victor Vinge had made in 1993. The singularity referred to is a technological singularity, which Vinge said would occur in just eight years from now. In a NASA paper he wrote called 'What is the Singularity?': "Within thirty years, we will have the technological means to create superhuman intelligence [in machines]. Shortly after, the human era will be ended."[355] Continuing, he said,

> From the human point of view this change will be a throwing away of all the previous rules, perhaps in the blink of an eye, an exponential runaway beyond any hope of control. Developments that before were thought might only happen in 'a million years' (if ever) will likely happen in the next century. … I think it's fair to call this event a singularity ('the Singularity' for the purposes of this paper). It is a point where our old models must be discarded and a new reality rules. As we move closer to this point, it will loom vaster and vaster over human affairs till the notion becomes a commonplace. Yet when it finally happens it may still be a great surprise and a greater unknown.[356]

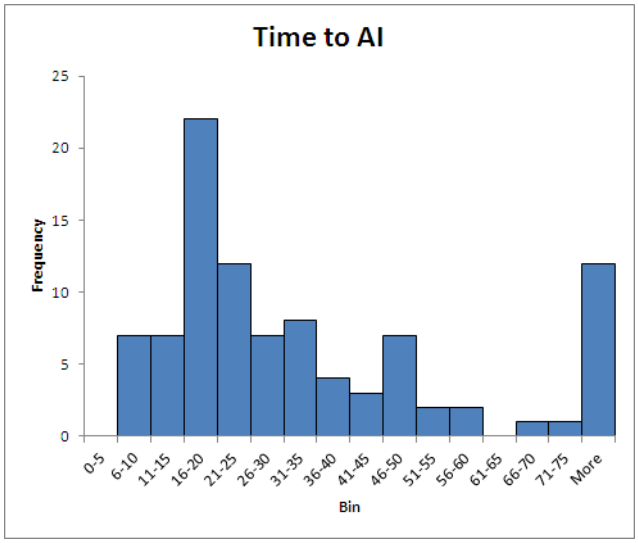
Ray Kurzweil, author of *The Singularity is Near*, is another who believes in this technological singularity in time, saying, "By 2019, a $1,000 computer will match the processing power of the human brain."[357] He seems to believe that artificial intelligence is a function of the calculating capacity of computers—an inevitable consequence of the exponential nature of growth processes.

Similarly, Hans Moravec forecast in *Robot* in 1990 that robots "could replace us in every essential task and, in principle, operate our society increasingly well without us."[358] Martin Rees, former President of the Royal Society, picked up this viewpoint by writing in *Our Final Century: Will the Human Race Survive the Twenty-first Century?*, "A superintelligent machine could be the last invention that humans need ever make."[359] And again, Stephen Hawking told the BBC on 2nd December 2014, "The development of full artificial intelligence could spell the end of the human race."[360]

When I read these statements—there are many such appearing regularly in the media today—I despair and grieve for humanity, spurring me on to complete my life's work in a manner that might be acceptable to my fellow human beings. For even though I know that our species is not special, that the laws of the

Universe apply to *Homo sapiens*, just like any other structure in the world of form, I am still a human being for practical purposes, wondering how my children and grandchildren's generations are going to cope with the immense changes they will face in their lifetimes.

There are some tiny glimmers of hope. In 2012, Stuart Armstrong, a James Martin Research Fellow at the Future of Humanity Institute at Oxford University, and Kaj Sotala, of the Singularity Institute, presented a paper at a conference in Pilsen, Czech Republic on research that they had done of predictions of artificial intelligence since Turing's seminal paper on the subject. As Armstrong writes in *Smarter Than Us*, "The track record for AI predictions is … not exactly perfect. Ever since the 1956 Dartmouth Conference launched the field of AI, predictions that AI will be achieved in the next fifteen to twenty-five years have littered the field, and unless we've missed something really spectacular in the news recently, none of them have come to pass," matching my own intuition on the subject.



This chart shows the frequency of the various predictions of time to AI that he and Kaj Sotala have developed. Nevertheless, Armstrong still writes, "There are no convincing reasons to assume computers will remain unable to accomplish anything that humans can."[361]

But what was perhaps the most surprising was that there was little difference between the sixty-four experts on the subject and the thirty-three predictions made by non-experts, such as journalists and authors. The reason why this study could help to change scientists' viewpoint on this vitally important issue is that fifteen predictions have already passed their 'sell-by-date'. Perhaps people could soon realize that these failed predictions are themselves a prediction of the futility of this exercise.

To help with such a realization, there is one other prediction that I would like to address, made by James Martin, who made a fortune writing dozens of books for information systems architects in business, a few of which I read when myself working in the industry and when, myself, doing research into the big questions of human existence. Like Ken Wilber and Peter Russell, he was a contemporary who followed a parallel, but very different career path from my own, joining IBM in 1959, at about the same age as I joined the company eight years later.

Although James Martin was essentially a business consultant, he did venture into the prospects for artificial intelligence later in life. For instance, in *After the Internet: Alien Intelligence*, he wrote, "Most of the popular predictions about computing assume that computer intelligence will be like human intelligence, and robots will be like the ones we see in the movies." But this is not how Martin saw the future. He wrote, "When computers are as powerful as the human brain, they won't be doing what the human brain does. They will have deep unfathomable forms of alien intelligence, vastly beyond human intelligence." Influenced by Richard Dawkins's program the 'Blind Watchmaker', he envisaged computer programs taking on a life of their own, self-generating themselves as self-evolving machines.[362]

Yes, indeed. This is essentially what has been happening to me since 1980, when I began a thought experiment to reverse Alan Turing's imitation game, guided by the both-and Principle of Unity rather than the either-or Law of Contradiction, which governs Western thought. So, to many, I am a human with an alien intelligence, not comprehensible to those not yet free of their cultural conditioning.

Nevertheless, this experiment in learning shows how Turing's notion of a Universal Machine can evolve into a Universal Human, as explained in my essays 'The Evolution of Universals: Being a Universal Human' and 'Integral Relational Logic: The Art and Science of Consciousness', written in 2015 and 2013, respectively, with much more detail in Part I of the *Wholeness* trilogy. But these are just expressions of Wholeness, not Wholeness itself. Rather, when I look deeply into myself, I see that our original thoughts in the noosphere can only arise through the power of Life, bubbling up from the Divine Origin of the Universe in the Numinosphere, like a fountain. It is with this understanding that we can begin to understand the nature of the biosphere.

5. The Biosphere

Many specialist disciplines are involved with studying the biosphere at various levels, such as botany, zoology, microbiology, biochemistry, genetics, neuroscience, medicine, and ecology. As I do not have direct experience of any of these subjects or of the different types of systems theory attempting to find general patterns among them, I view the biosphere by mapping the cognitive maps that specialists and generalists develop in their studies, augmented by observations of my own body and its relationship to mind, soul, and the Absolute.

My general approach in such studies, as in all of them, is similar to that of an information systems architect in business, whose task is to build integrated information systems from the specialist knowledge of the users of such systems, such as those in manufacturing, marketing, and finance. As a university is an organization just like a limited company or government agency, I use this approach to integrate all knowledge into a coherent whole, forming the transcultural transdiscipline of Panosophy. Conceptual clarity and integrity are of the essence here, for as Frederick P. Brooks, the project manager of the Operating System in IBM's System/360 family of computers in the 1960s, said, "conceptual integrity is *the* most important consideration in systems design",[363] for this is the way to obtain architectural cohesion.

In principle, this is not too difficult, for everybody implicitly uses Integral Relational Logic to form concepts and organize their ideas. So the specialist conceptual models that evolve within the minds of biologists, for instance, are particular instances of the universal, abstract concepts used to map the noosphere as a whole. So it is not surprising that we see the same arborizing and reticulating patterns everywhere, as Arthur Koestler pointed out in *The Ghost in the Machine*. However, there is much scepticism about the simplicity of this model among conventional scientists, which Koestler responded to at the Alpbach symposium of 1968, called 'Beyond Reductionism', saying in his inimitable manner:

> This almost universal applicability of the hierarchic model may arouse the suspicion that it is logically empty; and this may be a further factor in the resistance against it. It usually takes the form of what many call the 'so what' reaction: 'all this is old hat, it is self-evident'—followed by the *non sequitur* 'and anyway, where is your evidence?' Well, hierarchy may be old hat, but I would suggest that if you handle it with some affection, it can produce quite a few lively rabbits.[364]

Difficulties arise, however, because not many are yet aware that the biosphere is inseparable from the noosphere and the Numinosphere, as the Divine Origin of Life. It is therefore not surprising that Erwin Schrödinger's influential book *What is Life?*, published in 1944, does not answer his question. For he attempted to understand life from the perspective of physics and chemistry in the hylosphere. In a similar fashion, Brian Cox said in his popular BBC documentary series *The Wonders of the Universe* in 2011, life is just biochemistry.

Inspired by Schrödinger's book, in 1995 Lynn Margulis and her son Dorion Sagan by the astronomer Carl Sagan attempted to "put life back into biology" in *What is Life?: The Eternal Enigma*. Although I had been aware of her work for many years, it was not until I borrowed several of her books from Swedish academic libraries in the summer of 2015 in preparation for writing this chapter on the biosphere that I

was able to tidy up several conceptual confusions that I had previously had about this realm. For as a holistic biologist, Lynn Margulis is noted for her studies of symbiosis and cell symbiogenesis, reflecting the convergent tendencies in evolution. I particularly value her endeavours to ensure conceptual clarity, providing glossaries of terms in some of her books. However, as she was an agnostic, according to the Notable Names Database (NNDB),[365] she was not able to view the biosphere in the overall context of the Numinosphere in her lifetime and thus could not answer the question that she and her son had asked.

◇

Our chances of doing so today are not made easier because the entire field is littered with confusion. Even the term *biosphere* is a misnomer, arising from the topsy-turvy world we live in, attempting to understand flora and fauna, for instance, from the perspective of the hylosphere rather than that of the Numinosphere. The prefix *bio-* in *biosphere* derives from Greek *bios* 'life; course, way, or mode of living; livelihood', as distinct from *zoē* 'animal life, organic life', giving prefix *zoo-*, from *zoon* 'animal, creature, living being'. Both these words derive from the PIE base *g^{w}ei* 'to live', also the root of *vital*, *vivacious*, *quick* 'alive', and many other words.

However, the prefix *bio-* was very little used in compounds in ancient Greek, unlike its use in English and other European languages during the past couple of centuries, especially the last. The first notable use of *bio-* as a prefix with its original human meaning appeared in 1683, when John Dryden called Plutarch's *Lives* a 'biography', overseeing a translation into English, from Medieval Greek and Late Latin *biographia* 'writing of lives'.

Influenced by *biography*, *biology* first appeared in English in 1813, to mean 'the study of human life and character', once again with its original narrow meaning. However, the German naturalist Gottfried Reinhold Treviranus, a proponent of the transmutation of the species, had extended the meaning of *biology* to the study of all living beings in his *Biologie: oder die Philosophie der lebenden Natur* in 1802. This broader meaning became universal in the nineteenth and twentieth centuries.

But all these studies of the morphology, physiology, anatomy, behaviour, and origin of the species, for instance, whether in isolation or within ecosystems, tell us little about Life itself. As a deep study of the Numinosphere and noosphere indicate, what biologists study is *forms* of life, not the Divine Power of Life, a notion that lies outside science, as it is conceived today. So *biology* should really be called *biomorphology*, from Greek *morphē* 'form'. The biosphere is thus the sphere of biomorphs, not easy to define for the hylosphere, noosphere, and Numinosphere are also biomorphs. So, we need to look more closely at the defining attributes that distinguish the biosphere from the other spheres.

To approach a solution to this problem, I like to study the roots of languages to see how our forebears experienced and thought about life. In particular, we see similar relationships between breath, life, soul, and spirit in many different languages. For instance, *animate* derives from the Latin *animalis* 'having a soul', from *anima* 'breath, soul', which, of course, is the root of *animal*. These words are related to the Swedish *anda* 'breath, spirit' and *ande* 'spirit, soul', cognate with *aniti* 'breathe' in Sanskrit. In turn, *spirit* derives from the Latin *spīritus* 'breath, spirit', from *spīrāre* 'to breathe'. So the roots of our language clearly indicate that the ancients were well aware of the role that Spirit, arising from the soul, plays in breathing animals, such as human beings.

We can also see these etymological relationships in other languages. For instance, in the Old Testament, the Hebrew words *nephesh* or *nepeš* 'breath; life, life force, soul' and *rûaḥ* 'breath, wind; spirit, mind, heart' are translated as 'soul' and 'spirit', respectively. Similarly, in the New Testament, the Greek

words *psūkhē* 'breath, spirit; life, soul; heart, mind' and *pnuema* 'wind, breath' are also translated as 'soul' and 'spirit', respectively. As *The Strongest Strong's Exhaustive Concordance of the Bible* tells us, all these words denote 'the immaterial part of the inner person that can respond to God'.[366]

And in the East, *Atman*, "the real immortal self of human beings, known in the West as the soul",[367] derives from Sanskrit *ātman* 'breath, spirit; soul, essence, self'. Also in Sanskrit, *prana* means 'breath, vital life', from verbal root *prā* 'to fill', from PIE base **pelə-* 'to fill', also root of *fill*, *plenty*, and *plus*. Similarly, *qi* (*ch'i*), a central concept in Taoism and Chinese medicine, denotes "the vital energy, the life force, the cosmic spirit that pervades and enlivens all things", literally 'air, breath, gas'.

This nonphysical energy has been known throughout the ages as a vital principle underlying human experience, encapsulated in Henri Bergson's concept of *élan vital*, normally translated as 'vital impetus' or disparagingly as 'vital force', which Bergson called the '*original impetus* of life'.[368] Yet this vital force is "the energy or spirit which animates living creatures", as my dictionary says.

Similarly, Reginald O. Kapp, Professor of Engineering at London University, said in 1940 in *Science versus Materialism*, it is utterly amazing that vitalism is not so much dead, as it was claimed at the time, as a taboo. This iconoclastic book, which his son John has published on the Web, courageously made a commonsensical claim for the obvious, saying, "Any evidence which proves the organic world to be subject to laws from which the inorganic world is free is evidence for vitalism," for "as an engineer, we know that it is not in the nature of Matter unaided to fall into the form of machines."[369]

What I would like to do in this chapter, therefore, is to use the rigorous system of rational thought encapsulated in Integral Relational Logic to bring Life back to science. For by studying the biosphere in this manner, we can learn much about the phylogenetic prospects for humanity, explored in the penultimate chapter. In essence, what we are doing here is showing how the abstractions of the universal system of thought that everyone uses everyday appear in the conceptual models developed in scholarly studies of 'living matter'.

First, we know that the underlying ontological structure of the Totality of Existence is an infinitely dimensional network of hierarchical relationships prior to interpretation by an intelligent being. So what we need to do is use this knowledge to interpret these meaningless data patterns in a coherent epistemological, semantic model of the biosphere. It is absolutely essential in this mapping exercise not to be influenced by our cultural conditioning, by social constraints on our learning. For, as we see on page 46, scientific inquiry has been as much a social activity during the ages as a rational one, not a popular idea among philosophers of science.[370]

In the case of biology, any scientist who attempts to bring Life into science in order to bring the long-running war between science and spirituality to an end has effectively ended their career as a recognized and respected scientist. Not only this. There is something of a war going on between reductionist and holistic scientists, which we can say is characteristic of the first and second tiers of the spectrum of consciousness.

For instance, because *hierarchy* has military and ecclesiastical associations, giving the impression of a rigid, authoritarian structure, Fritjof Capra said in *The Web of Life* that in the ecological movement, a paradigm shift is taking place away from hierarchies towards networks.[371] It seems that many don't want leaders, wishing everyone to be treated equally, with no one being special. Yet, this is confusing what Ken

Wilber calls *domination hierarchies*, which are pathologically based on force or implied threat of force, with *actualization hierarchies*, whose function is to maximize the organism's potential.[372]

In Integral Relational Logic, there are three principal types of hierarchy, just as there are in the modelling methods used by information systems architects in business. These are generalization, aggregation, and evolutionary hierarchies. We see examples of each of these in the biosphere. For instance, the tree of life, showing the classification of the species in increasing levels of abstraction, is a generalization hierarchy. Our bodies are aggregation hierarchies, consisting of organs, tissues, cells, organelles, molecules, atoms, and subatomic particles, as a special case of associative relationships. And family trees are evolutionary hierarchies, stretching both backwards and forwards in time to our ancestors and descendants. We can use these three different types of hierarchy to bring universal order to our conceptual models of the biosphere.

The taxonomy of the species

We begin with generalization hierarchies, for these provide the conceptual framework or system of coordinates for bringing our chaotic thoughts into order, focusing attention on Plato's universals rather than particulars at this stage, corresponding to the class models of information systems architects in business.

In this exercise we need to be conscious that we form concepts by carefully examining the attributes of the data patterns of experience, putting entities into similar and different classes accordingly. As this is a universal principle of concept formation, we can use it to distinguish different types of attribute. In Integral Relational Logic, these are called identifying, naming, defining, prototypical, nondefining, and derived attributes.

An identifying attribute is that which uniquely denotes a being, in contrast to a naming attribute, which is not necessarily unique. For instance, social security number is a governmental identifying attribute, while our family and given names are not usually unique. There is a similar relationship in Lynn Margulis and Karlene V. Schwartz's *Five Kingdoms: An Illustrated Guide to the Phyla of Life on Earth*. They identify the phylum in which humans are members as A-37, while they name it Craniata, from Greek *kranion* 'brain', illustrated on page 80. This is different from normal nomenclature, for other scientists name this phylum Chordata, from Latin *chorda* 'cord', to denote animals with a notochord, 'a cartilaginous band or rod forming the primitive basis of the spinal column'.

As the name indicates, defining attributes are those that actually distinguish one being from another within a particular domain of discourse. For instance, a heptagon is a polyhedron with seven angles, from Greek *èpta* 'seven' and *gonia* 'angle, corner'. In this case, the identifying and naming attribute is closely related to the defining attribute, clearly a help in communicating meaning. But this is by no means always so simple. For instance, a rhombus or diamond shape is a quadrilateral with three defining attributes: opposites pairs are parallel, adjacent sides are equal, and the angles are oblique, in contrast to an oblong or rectangle, which has unequal sides and right angles.

Prototypical attributes are close to defining ones in that most beings of a particular class have them. The prime example is flying for birds, as not all birds actually fly. Nondefining attributes are all the other properties that beings have, but which do not define or typify them, such as the heights and ages of human beings.

Derived attributes are those that can be derived from conceptual attributes and relationships that have already been determined. For instance, if we know the population and size of a country, we can calculate

population destiny, how many people live in each square kilometre or the average number of square metres per person.

In object oriented programming languages, organized around generalization hierarchies, properties of subclasses are inherited or derived from higher-level classes, which helps explain why the pace of software development is accelerating exponentially. We see similar relationships in the tree of life. For instance, a defining attribute of mammals is that females succour their young. So all types of mammal, such as mice, whales, and humans, also do.

There are similar relationships in deductive logic. For instance, we know that all humans are mortal and that all Greeks are human. We can therefore deduce that all Greeks are mortal. Here the premises and conclusion have the form 'All A are B'. But we can also consider 'Some A are not-B', most simply depicted in Euler-Venn diagrams, taught to primary school children in the 1960s.

However, difficulties can arise when scientists attempt to quantify these relationships, for we are then led into the murky waters of causality and probability. Most famously, Einstein wrote to Max Born in 1926 in these words: "Quantum mechanics is certainly imposing. But an inner voice tells me that this is not the real thing. The theory yields much, but it hardly brings us closer to the Old One's secrets. I, in any case, am convinced that he does not play dice." [373]

Today, recognizing that we do not live in an absolutely deterministic Universe, a number of philosophers and scientists are attempting to understand the 'Old One's' secrets by calculating the relative probabilities of *Homo sapiens* becoming extinct within a hundred years or many thousand of years. More about this later. But first we need to explore a little more what we humans have learnt about humanity's place in the overall scheme of things.

Regarding generalization relationships in the biosphere, the key figure was Carl Linnaeus from Sweden, who published his seminal work *Systema Naturæ* in 1735 during a stay in the Netherlands.[374] Linnaeus was so named because in the eighteenth century, some Swedes, like clergymen, began using family names based on nature, rather than the traditional patronymic and occasional matronymic names, like Andersson and Annasdotter. Examples are *Hallenberg* 'raspberry hill' and *Blomkvist* 'flowery twig'.

In the case of Linnaeus' family, two great uncles changed their surname to *Tiliander*, after the Latin word for lime or linden tree, genus *Tilia*. So when Linnaeus' father studied theology, he followed his maternal uncles' lead, but chose *lind*, the Swedish word for lime tree.[375] So in *Systema Naturæ*, written in Latin, Linnaeus is known as *Carolus Linnæus*. In Sweden, he has been known since he was ennobled in 1761 as Carl von Linné, portrayed on the one hundred kronor banknote until October 2016, to be replaced then by Greta Garbo. So Carl Linnaeus, the name by which he is known internationally, is a mixture of Swedish and Latin. What then makes Carl von Linné so famous in Sweden that many towns and cities have named streets after him?

Well, it's very simple, as Sandra Knapp of the Natural History Museum in London tells us in an article to mark the tercentenary of Linnaeus' birth. Linnaeus gave each species a genus name and what he called a 'trivial name', greatly simplifying the various one-, two-, and three-name conventions used before that time.[376] The simplicity of this binomial system soon caught on so that today all species are named in this consistent manner, like *Homo sapiens* 'wise human' and *Allium sativum* 'garlic', with a trinomial name for subspecies. For instance, the Siberian tiger is named *Panthera tigris altaica*, after the Altai Mountains, one of ten extant subspecies of tiger.[377]

But Linnaeus did not stop at genus as a way of classifying groups of species. He visualized a number of higher levels of abstraction culminating in three kingdoms: animal kingdom (*Regnum animale*), the plant kingdom (*Regnum vegetabile*), and the mineral kingdom (*Regnum lapideum*), corresponding to the question, "Is it animal, vegetable, or mineral?" in the popular radio parlour game 'Twenty Questions' of my childhood and adolescence.

Such an ordering process is called *taxonomy*, the science of classification, from Greek *taxis* 'arrangement, order' and *nomia* 'distribution, method', from *nomos* 'custom, law', from *nemein* 'manage, control, arrange, assign'. So *astronomy* is an arrangement of the stars and *economy* is the management of a household. Similarly, *taxonomy* is an arrangement of an arrangement, today either meaning classification, in general, or specifically, the systematic classification of living organisms, following the publication of *Systema Naturæ*.

Then over the years, biological classification evolved in a natural way in the noosphere, like all evolutionary processes. Even in Linnaeus' lifetime, *Systema Naturæ* went through thirteen editions, expanding from just eleven pages to some four thousand in the last edition posthumously published with his name.[378]

So, how are biological taxonomists implicitly using the epistemological modelling methods of Integral Relational Logic today? Well, Lynn Margulis and Dorion Sagan tell us that there were three basic concepts of species in vogue at the beginning of the millennium. The first is the morphological concept, based on what organisms look like, such as domestic dogs, which are classified as either *Canus familiaris* or *Canis lupus familiaris*, a subspecies of the grey or timber wolf. This is the approach that Linnaeus took.

Zoologists have also imposed what they call the 'biological species concept', based on whether animals can mate and produce fertile offspring. For instance, coyotes and dogs cannot and so are 'reproductively isolated'.

The third concept of species is variously known as phylogenetic, evolutionary, or cladistic, based on the principle that all groups of organisms are descended from a common ancestor, which Darwin visualized in *The Origin of Species*. As he said in the first edition in 1859,

> By the theory of natural selection all living species have been connected with the parent-species of each genus, by differences not greater than we see between the natural and domestic varieties of the same species at the present day; and these parent-species, now generally extinct, have in their turn been similarly connected with more ancient forms; and so on backwards, always converging to the common ancestor of each great class. So that the number of intermediate and transitional links, between all living and extinct species, must have been inconceivably great. But assuredly, if this theory be true, such have lived upon the earth.[379]

However, as Margulis and Sagan point out, "in 500 pages of closely spaced type the title question—on the origin of species—[was] entirely circumvented—abandoned, ignored, or coyly forgotten." Quoting the Australian biologist George Miklos, "The 'struggle for existence' has been accepted uncritically for generations by evolutionary biologists with the *Origin of Species* quoted like so much Holy Writ, yet the origin of species was precisely what Darwin's book was *not* about."[380]

This is a classic example of Hans Christian Andersen's tale of *The Emperor's New Clothes*, popular the world over. For we see examples everywhere, in science, as elsewhere, with so many unwilling to point out the pretences that the 'courtiers' in our lives would have us believe, which we look at further on page 137.

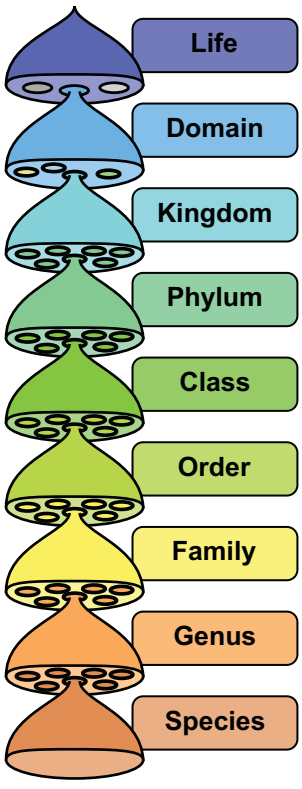
Regarding the taxonomy of the species, there is no need to get into arguments about what is the best arrangement. In business, there is no 'right' or 'wrong' way to define class models. Information systems architects assess what is most appropriate for the organizations that they are mapping, taken as a whole. However, there is a difference here between humans and computers. In business information systems, it is

not easy to make radical changes to class models once they have been established. Human beings often also act in this rigid manner, being identified with one semantic structure, not realizing that there is often more than one way to interpret the meaningless data patterns of experience in organized meaningful concepts.

The most comprehensive book on biological classification I have at least browsed through is Lynn Margulis and Karlene V. Schwartz's *Five Kingdoms*, borrowed, most appropriately, from Linnæus University (*Linnéuniversitetet*) in Kalmar in Sweden. This book is an encyclopaedic catalogue providing defining attributes for ninety-six phyla organized in five kingdoms and two superkingdoms, also called domains, illustrated on the next page, with the human phylum being called *Craniata*, rather than the more usual *Chordata*.[381] At the top of the hierarchy is **Life**, supposedly the superclass of all classes of concept in the biosphere, just as **Being** and **Object** are the superclasses for the Totality of Existence and the business world, respectively.

However, surely *Life* is a misnomer. Shouldn't the superclass be at least **Living being**, in constant change and development? If so, how is this superclass to be defined? James Lovelock, much supported by Lynn Margulis, considers the Earth to be a living being, as Gaia, the ancient Greek word for 'Mother Earth'. On the other hand, Margulis and Schwartz do not classify viruses within any of the five kingdoms, consisting of organisms that are either cells or composed of cells. For while viruses carry genetic material, they are much smaller than cells, only replicating when they enter a cell. As they point out, viruses have few generalizing attributes. For instance, "the polio and flu viruses are probably more closely related to people, and the tobacco mosaic virus (TMV) to tobacco, than polio virus and TMV are to each other".[382]

It thus seems most appropriate to call the top of the hierarchy in the biosphere **Cellular living being**, with the implication, defining or nondefining, that cells are apparently self-replicating. For we need to remember that cells are never separate from the Ocean of Consciousness for an instant and so can be said to be conscious. If biologists could recognize this fact through self-inquiry, much of what is called the mystery of life would be explainable, no longer a mystery. For as Niles Eldredge wrote in the Foreword to Lynn Margulis and Dorion Sagan's *What is Life?*, we humans are organisms and it is by knowing ourselves we know others, including the diversity of the species we so enjoy.[383]

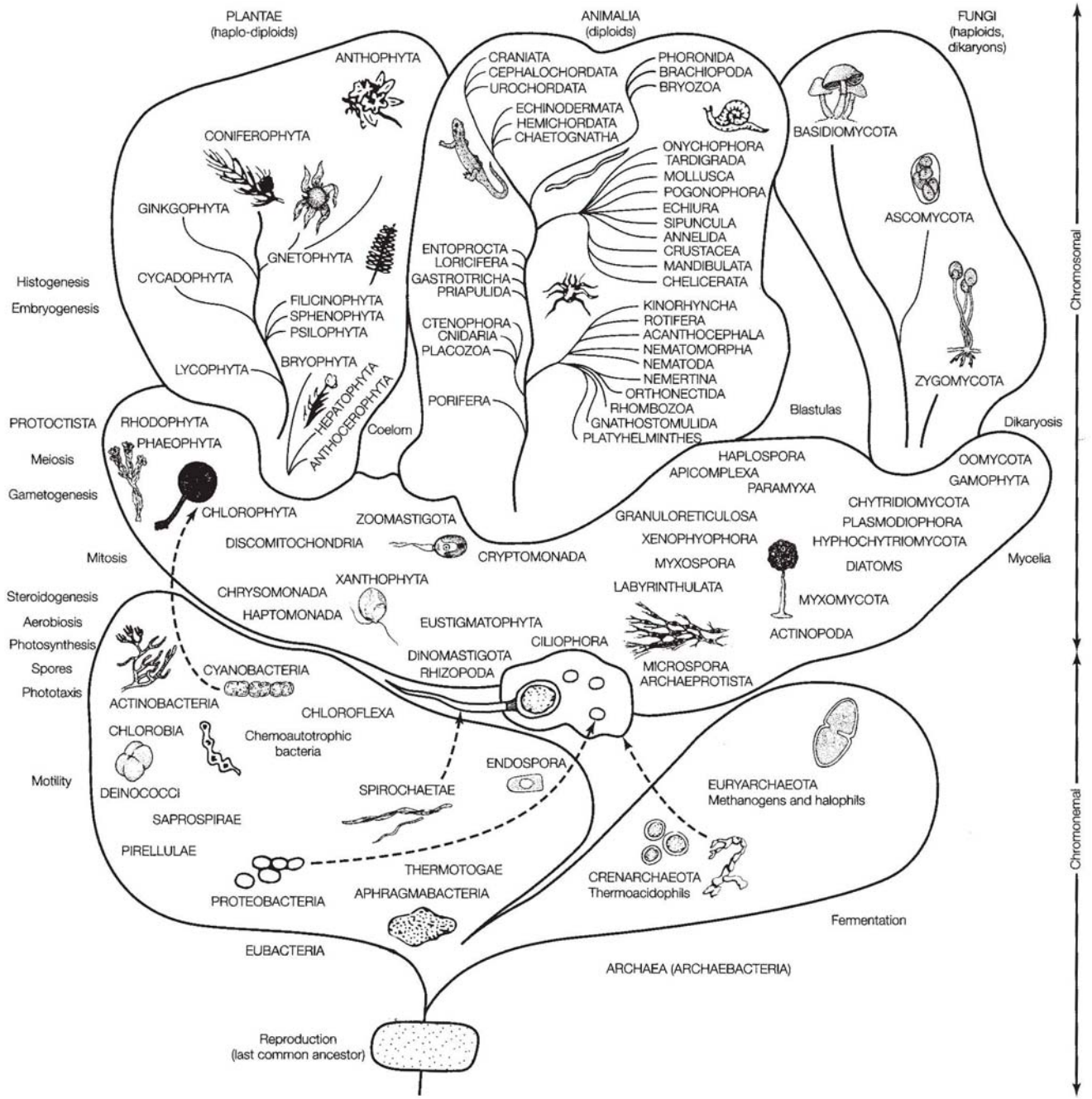


As scientists estimate that there are at least three million and perhaps thirty million species of living organisms now existing, with an even greater number now extinct,[384] we can only bring a sense of order to all this complexity through generalization hierarchies, with the details being held in computer databases, accessible through the Internet, such as the Tree of Life Web Project.[385]

This diagram from Wikipedia illustrates just some of the levels in the tree of cellular life that most biological taxonomists seem to agree on today. In the five kingdoms model first advanced by Robert Whittaker in 1959, there are just two domains to distinguish cells that have a nucleus and those that do not. The latter are called *prokaryota*, from Greek *pro-* 'before' and *karuon* 'kernel, nut, seed', for they evolved before the former, called *eukaryota*, from Greek *eu-* 'easily (formed)', a distinction made by Édouard Chatton in 1937.[386]

There is just one kingdom of prokaryotes, which are single-celled organisms called bacteria or monera, divided into two subkingdoms archaea and eubacteria, with two and twelve phyla, respectively. *Monera* derives from Greek *monērēs*

The phyla of life on Earth based on our modification of the Whittaker five-kingdom system and the symbiotic theory of the origin of eukaryotic cells.



'solitary', from *monos* 'single, alone' and *archaea* derives from Greek *arkhaios* 'primitive, ancient', from *arkhē* 'beginning', from *arkhein* 'to begin', indicating that all forms of life on Earth have evolved from such unicellular organisms.

Although we cannot see bacteria with the naked eye, they are the dominant form of cellular life on Earth, more abundant, more indestructible, and more diverse than the eukaryotes, inhabiting a greater range of environments than all the other four kingdoms combined, Stephen Jay Gould tells us. Bacteria lived long before *Homo sapiens* arrived on the scene and will probably do so long after our species has become extinct.

The distinction between *prokaryotes* and *eukaryotes* has greatly helped to classify microorganisms. In the mid nineteenth century, Ernst Haeckel, who coined the word *monera*, realized that there are more forms of life than the plants and animals. He called these *protista*, superlative of *prōtos* 'first', a term that does

not seem to be clearly defined today. About the same time, John Hogg suggested that this third category of cellular life could be called *protoctista*, from Greek *prōto-* 'first', and *ktistos* 'produced, created', from *ktizein* 'to create, establish', from PIE base *tkei-* 'to settle, dwell, be home'. In 1956, Herbert F. Copeland adopted this term to denote the kingdom of eukaryotic microorganisms, some of which have evolved into multicellular descendants.

Then, three years later, Robert Whittaker recognized the existence of fungi as another distinct eukaryotic kingdom leading to his five kingdoms. One distinction between prokaryotes and the other four kingdoms is that the former evolved through symbiogenesis from symbioses between two or more different kinds of bacteria. "As the symbionts integrated, a new level of individuality appeared," Margulis and Schwartz tell us. In contrast, animals develop from a blastula, plants from an embryo, and fungi from spores.[387]

In addition to Whittaker's two-domain, five-kingdom model, favoured by Margulis and Schwartz, Carl Woese and Thomas Cavalier-Smith have proposed other epistemologies. According to Wikipedia, Woese suggested a six-kingdom model in 1977 and a three-domain one in 1990. Margulis and Schwartz address this latter scheme in their book, writing, "its three domains and multiple kingdoms are established solely by criteria of molecular sequence comparisons, whereas each kingdom in our five-kingdom scheme can be uniquely defined by using all features of the whole organism—molecular, morphological, and developmental." Furthermore, "proliferation of so many kingdoms … defeats the purpose of manageable classification of the fundamental diversity of our planetmates into a system from which information can be retrieved by teachers, naturalists, and other nonspecialists."[388]

Class	*Cellular living being*
Attribute name	**Attribute value**
Domain	Eukarya
Kingdom	Animalia
Subkingdom	Metazoa
Phylum	Chordata
Subphylum	Vertebrata
Superclass	Tetrapoda
Class	Mammalia
Subclass	Theria
Infraclass	Eutheria
Cohort	Ferungulata
Superorder	Ferae
Order	Carnivora
Suborder	Fissipeda
Superfamily	Canoidea
Family	Canidae
Subfamily	Caninae
Tribe	(Null)
Genus	Canis
Subgenus	(Null)
Species	*Canis lupus* (wolf)
Subspecies	*Canis lupus occidentalis* (northern timber wolf)

Margulis and Schwartz don't mention Cavalier-Smith's six- and eight-kingdom models, proposed in 1993 and 1998, about the time the third edition of their book was published. But maybe their comments about Woese's scheme would apply to Cavalier-Smith's also. The difficulty that someone like me has in making sense of all this is that a source like Wikipedia has many different editors, not necessarily with the same holistic approach. So all I can do in this book is to point out that everyone implicitly uses Integral Relational Logic in their classification systems. To illustrate this point, as it applies to biological taxonomy, in the mid-1980s, I drew this table of the zoological hierarchy for the timber wolf of the Canadian subarctic given in the taxonomy article in *Encyclopædia Britannica*.

Aggregation hierarchies

As the cells in our bodies have evolved from prokaryotes, in a manner not yet fully explained, let us now look at their role in aggregation hierarchies, not to be confused with generalization hierarchies. The most obvious example of an aggregation relationship is that between physical aggregates. For example, protons, electrons, and molecules are parts of atoms, which are parts of molecules, and so on. But aggregate relationships are not necessarily physical. A section is part of a department, which is part of a division,

which, in turn, is a part of a company, which could be part of a conglomerate. And all these companies and conglomerates make up the business world as a whole in the capitalist economic system.

Not surprisingly, an aggregation relationship is called 'a-part-of' relationship, in contrast to 'a-kind-of' relationship in generalization or class hierarchies. The essential difference between these two types of hierarchies is that while a generalizing relationship associates classes together, an aggregate relationship associates instances of classes with each other.

We sometimes use different words to distinguish entities that are participating in these two types of hierarchy. For example, the class **Chemical element** has just over one hundred different subclasses that can be organized in the periodic table according to the number of electrons and the way that they relate to the other particles, which can be arranged in the familiar tabular form, depicted on page 112. When viewed as objects, these elements are atoms. But we don't normally say that oxygen is a kind of atom or that a proton is a part of an element; we are more likely to say that oxygen is a kind of element or that a proton is a part of an atom.

Another way of distinguishing generalization and aggregation hierarchies is to note that in a class hierarchy, the subclasses are mutually exclusive. Thus a type of element is hydrogen, oxygen, or one of the other one hundred elements. An element cannot be both hydrogen and oxygen. So a generalization relationship is sometimes called an 'or-relationship'. An aggregation relationship, on the other hand, is an 'and-relationship'. An atom consists of a number of electrons, protons, and neutrons.

In terms of cells, by analysing these structures, cellular biologists can see that they consist of various assemblages and subassemblies and that they combine to form organs and complete bodies in a synthesizing process. Such cells can be regarded as the basic building block of the biosphere, just as being and concept are the fundamental conceptions in the Numinosphere and noosphere, respectively. It is thus vitally important to remember that just as no beings are ever separate from any other, neither are cells.

To reflect the principle that units in aggregation hierarchies, such as cells, have both an inner essence and outer environment, Arthur Koestler coined the word *holon*, from the Greek *ὅlos* 'whole' and the suffix *on*, which, as in prot*on* or neutr*on*, suggests a particle or part. As he said, "The members of a hierarchy, like the Roman god Janus, all have two faces looking in opposite directions; the face turned towards the subordinate levels is that of a self-contained whole; the face turned upward towards the apex, that of a dependent part."[389] Rather surprisingly, the Vatican, one of the most exclusive, either-or organizations in the world, has a statue of this Roman God in one of its museums.[390]

As *hierarchy* derives from Greek *ἱerarchēs* 'high priest, sacred ruler', from *ἱeros* 'sacred' and *arkhos* 'leader, ruler', from *arkhein* 'to begin, rule, command', it does not reflect the dual nature of holons. So Koestler rather hesitatingly coined the word *holarchy* to denote the universal principle that Wholeness, as the union of all opposites, rules. In terms of holons, he pointed out that they have both a self-assertive and integrative tendency, which must be balanced if they are to live in dynamic equilibrium with their environment.[391]

This applies especially in the social holarchy, where we, as cells in the body politic, have both individual needs, which may be in conflict with those of others, and collective needs, where compassionate caring ensures social harmony, recognizing the ubiquity of the Hidden Harmony as the governing principle of the Universe.

How then do geneticists and cell biologists interpret the energetic data patterns that they observe through their optical and electron microscopes? Well, there seem to be two basic approaches, depending on the social environment they operate within. This is how Bruce Lipton describes this split in *The Biology of Belief: Unleashing the Power of Consciousness, Matter, & Miracles*, published in 2005: "On one side of the line is a world defined by neo-Darwinism, which casts life as an unending war among battling, biochemical robots. On the other side of the line is the 'New Biology', which casts life as a cooperative journey among powerful individuals who can program themselves to create joy-filled lives."[392]

Bruce's story, narrated in *Biology of Belief*, well illustrates the transformation of consciousness that many are going through today. While recovering from a midlife crisis, which led him to resign from his tenured position in academia, he had a eureka moment in the autumn of 1985 at two in the morning. This seems to have been a three-step process.

First, in attempting to understand what he was looking at in his petri dish, he realized that cells are like 'miniature humans', as multicellular organisms. So "we must inherently share basic behavioural patterns with our own cells." Secondly, he realized, "Just like a single cell, the character of our lives is determined not by our genes but by our responses to the environmental signals that propel life." Thirdly, when viewing the cell as an information processing system, he realized that the "membrane is a liquid crystal semiconductor with gates and channels", similar to chips in computers.[393]

Since then, Lipton has been playing a leading role in the development of the revolutionary science of epigenetics, from Greek *epi-* 'upon, above', a term that C. H. Waddington coined in 1942, from *epigenesis*, a word used in the nineteenth century as the opposite to the theory of evolution or preformation. Today, with much greater understanding, *epigenetics* is defined as 'the science of how environmental signals select, modify, and regulate gene activity'.

So sadly, we see yet another battle going on in science, which is part of the long-running war between science and spirituality. For having been almost an atheist as a conventional cell biologist, Bruce today calls himself a 'card-carrying mystic', who quotes Jesus, Buddha, and Rumi. Yet, he is thoroughly rational in his teachings, based, as they are, on experiences shared with many millions of others.

At the heart of this battle is Darwin's notion of natural selection as the primary evolutionary process, which Herbert Spencer called 'survival of the fittest' in 1864 in *Principles of Biology*.[394] This fitted in very well with the Victorians' bellicose attitude as they sought to build the British Empire by colonizing vast tracts of the planet. As we saw on page 33, during the five thousand years of the patriarchal epoch, when divergent mental evolution has ruled the roost, we humans have been one of the cruellest ever to have lived on Earth. And you cannot change human nature, it is widely believed. We are innately selfish, interested only in our own survival, not the survival of our species. So we are taught by the dominant cultures in the world that we must fight and compete with our fellow human beings for a portion of the finite money supply, otherwise we will die.

Likening cells to belligerent humans, Richard Dawkins wrote the infamous *The Selfish Gene*, which I have found is almost impossible to read, so far removed from Reality as it is. Commenting on this book, Lynn Margulis and Dorion Sagan have said, "A gene is never a self to begin with. A gene alone is only a piece of DNA long enough to have a function. … There is no life in a gene. There is no self. A gene never fits the minimal criterion of self, of a living system."[395]

Adam Rutherford, another neo-Darwinist, said in the introduction to his three-part BBC documentary on *The Cell* in 2011, "We are cells. Every time we breathe, we move, we think, cells do the

work for us. … The idea that all living creatures, from amoebas to humans, are made up of cells, is the cornerstone of biology. It's the theory of everything."[396]

Of course, it is not. In particular, the idea that cells control our thoughts is utter nonsense, as absurd as the Medieval belief that the Sun circles the Earth. Yet the central dogma of biology is still being taught to a credulous public, who seemingly believe in anything that scientists tell them as if they were priests proclaiming the word of God. As Bruce Lipton writes, "The media worsens the situation by misleading the public with a never-ending onslaught of stories presumably identifying a gene that controls this cancer or that malady."[397]

Yet, there is some truth in what both geneticists and epigeneticists are saying. We need to remember that Teilhard's conception of the Divine *Milieu*, with its centre and environment, is as relevant in the biosphere as it is in the Numinosphere and noosphere. Most significantly, the centre of the biosphere is the Divine Source of Life, constantly bubbling up from the Origin of the Universe. In terms of cells, both their centres and surroundings need to be considered when viewing them as holons, having both self-assertive and integrative tendencies.

After much investigation on the Web over the years, I have found no social organism that yet reflects this both-and understanding. As I see the situation, geneticists and epigeneticists mostly lie within the first and second tiers of consciousness, outlined on page 55. Both have yet to learn the role that the Numinosphere and noosphere play in the dynamics of the cell, an understanding that comes through self-inquiry in the third tier of consciousness, where all opposites are unified in Wholeness. So our understanding of the biosphere in the noosphere is still evolving, not yet having reached its glorious culmination.

The discovery of the cell

It might help to stimulate this awakening process by noting that while the first cells appeared on Earth some three and a half billion years ago, it is only in the last three and a half centuries that we have discovered the existence of cells and some of their properties. In Part I of *The Cell*, titled 'The Hidden Kingdom', Adam Rutherford provides an illustrated guide to how some of the hidden secrets of the cell have been revealed as magnifying lenses became stronger and stronger, which he claims unlock the mysteries of life itself.

The story begins in Delft in the Netherlands with Antonie van Leeuwenhoek, a linen merchant who used magnifying glasses to inspect the quality of his cloth. He was also a master craftsman, building lenses that could magnify five hundred times, far greater than any of his contemporaries, not to be exceeded for a hundred years for he kept his lens-making techniques a secret. Van Leeuwenhoek used his lenses to view everything from fleas to microscopic organisms in his local lake. There he discovered what he called a myriad of 'animalcules' or little animals, which he enthusiastically described as the most marvellous discovery that he had found in nature. Not surprising, for he was the very first person to see living cells. Today, some of these are called protozoa, from Greek proto *prōto-* 'first' and *zoon* 'animal', although, as protoctists, they are not actually animals in the five-kingdoms taxonomy, as Lynn Margulis points out.

But as a businessman, how could Van Leeuwenhoek tell the world about his great discoveries? Well, rather hesitatingly, but with the support of prominent Dutch physician Reinier de Graaf, in 1673 Van Leeuwenhoek began writing a series of letters to the Royal Society of gentlemen scientists about his observations, initially of small creatures, like bees and lice. However, not surprisingly, his letters during

the next three years describing his little animals were met with much scepticism, as the members could not see what Van Leeuwenhoek could see.

However, by 1677, Robert Hooke did manage to observe microscopic organisms in water from the River Thames and the science of microbiology was launched. These were called *cells*, from Latin *cella*, 'small room', a word that Hooke had coined in 1665 from observations of the pores in cork, which appeared 'sexangular', like a honeycomb.[398] Accordingly, in 1680, Van Leeuwenhoek was elected a fellow of the Royal Society as the discoverer of cells.

But Van Leeuwenhoek did not stop there. He turned his attention to his own body, examining bacteria in his mouth, red blood cells, and even spermatozoa in his semen, acquired during natural sexual intercourse. These discoveries led to many wild imaginings about the creation of life, such as spontaneous generation. For there was still much to be discovered about the microscopic world, which is yet to be set within the Contextual Foundation of the Absolute and the Numinosphere, its first abstraction.

For over a hundred years, cell biology was thus trapped in medieval thinking. The turning point came in the early 1800s at the Royal Botanic Gardens in Kew, London, where Robert Brown studied some 4,000 species that he had collected in Australia as the naturalist on the *HMS Navigator*, cataloguing half of them.[399] When looking at the fairly large cells of the many varieties of orchid, he noticed a distinctive shape at the centre of each cell, which he called the nucleus, from Latin *nucleus* 'kernel, inner part', from *nucula* 'little nut'. He wasn't the first to observe the nucleus, but he was the first to realize that the nucleus is present in every cell of every plant that he looked at. The nucleus is ubiquitous, an idea he presented in a paper read to the Linnean society in 1831 and published in 1833.[400]

Joseph Jackson Lister, a wealthy wine merchant and father of Joseph Lister, the pioneer of antiseptic surgery, took the next major step in microbiology. In his spare time, he found a way of constructing a microscope with two lenses, which minimized chromatic aberration, greatly improving the magnifications possible with single lenses. He published the results of his discoveries in 1830 in the *Philosophical Transactions of the Royal Society*,[401] commissioning James Smith, an employee of the instrument-making firm of William Tulley, to construct microscopes to his design. The single-lens microscope thus became obsolete, allowing cell biologists to look ever deeper inside the cell.[402]

Theodor Schwann and Matthias Jakob Schleiden, a zoologist and botanist, respectively, made what Edmund Beecher Wilson called one of the foundation stones of modern biology in 1896: the theory of cells, only comparable in significance with the theory of evolution. Schwann, at the Anatomical Museum in Berlin, had been using a Lister microscope to view cells in frogs, much more difficult to see than plants, while Schleiden, from the University of Jena, had been studying cells in plants. Then, when they met over dinner in October 1837, they realized that they were looking at essentially the same structures.[403]

The thitherto two separate strands of botany and zoology were united on the fundamental principle that all living organisms are a cooperative of the same building block: cells. However, it seems that they did not publish their findings jointly. In 1838, Schleiden wrote 'Contributions to Phytogenesis', from Greek *phuton* 'plant', while Schwann published a book in 1839 titled *Microscopical Researches into the Accordance in the Structure and Growth of Animals and Plants*, which Henry Smith translated into English in 1847. According to Wikipedia, this book contains the statement "All living things are composed of cells and cell products" although I did not find these exact words in this book downloaded from the Web.

However, Schwann and Schleiden made a mistake in their theory of cells, about where new cells actually come from sending biology down a blind alley for more than a decade. The two Germans thought that new cells formed spontaneously and formed from a tiny speck of nucleus material. It was

almost as if new cells had come out of nowhere,[404] not unlike spontaneous generation of multicellular organisms.

Louis Pasteur, on the other hand, was convinced that cells could not arise through spontaneous generation, contrary to the views of Félix-Archimède Pouchet, director of the Rouen Museum of Natural History. To settle the question one way or another, in 1860, the French Academy of Sciences in Paris offered the Alhumbert Prize to whoever could experimentally demonstrate for or against the doctrine. Two years later, Pasteur won the prize with an ingenious experiment, writing "Never will the doctrine of spontaneous generation recover from the mortal blow of this simple experiment. There is no known circumstance in which it can be confirmed that microscopic beings came into the world without germs, without parents similar to themselves."[405]

In parallel with these developments in France, Robert Remak, a Polish Jew living in Germany, was to make the next major breakthrough in how cells form. In the 1840s, when studying the red blood cells of developing chicks, he noticed that a few of them split into two cells. He told his friend Rudolf Virchow, Professor of pathological anatomy at the University of Würzburg, who was initially sceptical of the idea that cell division is universal, that all cells are formed in this way. So, ever persistent, Remak turned his attention to frog spawn, observing cell division and differentiation in the embyro, founding the field of embryology; how a single fertilized egg becomes a fully functioning multicellular animal.

At this point, Virchow sat up and published Remak's work as his own in 1855. For while Virchow was an established figure in academia, Remak, as a Jew, was not allowed to teach in universities. Not surprisingly, the friends fell out, Remak being recognized today as one of the unsung heroes of biology, having previously been regarded as a mere footnote in the history of science. For what he showed is that cells are only born from other cells, a universal principle. Virchow coined the catchy phrase *omnis cellula ex cellula* to encapsulate this fundamental principle of biology, meaning 'all cells from other cells'. This implied that all life on Earth must have begun with a single cell. All forms of life share the same family tree.

Accordingly, after some two hundred years studying cells, scientists had discovered some of the fundamental principles underlying the theory of cells. But how did the patterns that they were observing come about? How do cells work? To answer this question, scientists needed to study the chemistry in the organelles in the cells, exploring the relationships between the atoms as they form molecules.

Friedrich Miescher, a newly qualified Swiss physician, set these biochemical studies in motion at the University of Tübingen, Germany, where Europe's first biochemistry laboratory was situated. In the winter of 1868 and 1869 he studied the nucleus of the white blood cells of soldiers wounded in war. There he discovered a strange molecule that contained phosphorous, as well as carbon, hydrogen, oxygen, and nitrogen, found in other organelles, like protein. He then found the same molecule in the sperm cells of frogs, carp, bulls, and salmon and induced that it is universal. Accordingly, he called it nuclein, which we know today as nucleic acid, of which deoxyribonucleic acid (DNA) is the most notable example.[406]

However, Miescher was a man far ahead of his time. It was to take nearly a century before the full significance of his work was revealed in the genetic code, with many unanswered questions, even today. Many other pieces of the jigsaw puzzle had to be created before they could be put together to form a coherent picture of the chemistry of forms of life.

Theodor Boveri found another piece of the puzzle in the Bay of Naples in 1888, when studying the embryos of marine life in the warm waters of the Mediterranean. There he studied the way a fertilized egg splits into two, four, and eight cells, which subsequently differentiate into the specialized cells that form the animal. In examining this splitting process, he noticed that little rods appeared in the nucleus, which are called chromosomes from the chemical dyes he was using to give them a colour. This process of cell division is called *mitosis*, from Greek *mitos* 'thread of a warp'.

Boveri noticed that an identical set of chromosomes was forming in every cell. Any more or less, the embryo would die. He thus reasoned that chromosomes contain what he called hereditary characters. So whatever information is contained in chromosomes, it was essential for life.

To make further progress in studying these hereditary characteristics, a much simpler organism was needed. In the 1910s at Columbia University in New York, following Charles W. Woodworth and W. E. Castle's proposal that the fruit fly *Drosophila melanogaster* could be used for genetic research, Thomas Hunt Morgan took up their suggestion. For this insect contains just four pairs of chromosomes and breeds new generations rather rapidly.

Then after discovering that some wild-type red-eyed flies mutated into ones with white eyes, he crossbred red-eyed males with white-eyed females and discovered similar patterns to those of Gregor Mendel, who did a series of experiments with pea plants between 1856 and 1863 at the Augustinian St Thomas's Abbey in Brno, Moravia, publishing his results in 1866. For instance, Mendel showed that when a yellow pea and a green pea were bred together their offspring plant was always yellow. However, in the next generation of plants, the green peas reappeared at a ratio of 1:3. To explain this phenomenon, Mendel famously coined the terms *recessive* and *dominant* in reference to certain traits.

However, in 1868, Mendel was appointed the abbot of the monastery, giving little time for his genetic studies. Furthermore, as scientists' knowledge of the cell was not yet sufficient to explain the mathematical patterns that Mendel observed in his experiments, almost no one followed up on his work. In the event, Hugo de Vries and Carl Correns independently reproduced Mendel's experiments in 1900 and on searching the literature discovered that Gregor Mendel should rightly be called the 'father of genetics'.

Morgan and three of his colleagues published the results of their experiments in 1915 in *The Mechanism of Mendelian Heredity*. They were interested in how haploid cells, with only one set of chromosomes, are created from the diploid cells formed when a sperm fertilizes an egg, containing chromosomes from female and male parents. Ten years earlier, the word *meiosis* had been coined in scientific journals to denote this lessening process, from Greek *meiōsis* 'lessening', from *meioun* 'lessen'.

Meiosis in the testis and ovary, jointly known as gonads, begins in the same way as cell division in mitosis: identical copies of the diploid chromosomes are formed. But then in a two-step process, four haploid cells are formed in meiosis. Not only this, during this splitting process, matching sections of the chromosomes inherited from the parents crossover and recombine to form the gametes that unite in sexual reproduction.

So in any individual gamete in a set, there is a 50:50 chance which egg or sperm is actually involved in the fertilization, resulting in Mendel's 3:1 ratio of inherited characteristics, as Hunter and his colleagues describe in their book. It is thus not surprising that "geneticist Curt Stern called the book 'the fundamental textbook of the new genetics' and C. H. Waddington noted that 'Morgan's theory of the chromosome represents a great leap of imagination comparable with Galileo or Newton'," according to Wikipedia, lacking citations for these important quotations.

The next step on this epic journey was made in the 1920s and 1930s on both sides of the Atlantic. At the time, many scientists believed that the protein component of chromosomes would prove to be the repository of hereditary information, indicated in the root of *protein*, which is Greek *prōteios* 'primary', from *prōtos* 'first'. Fred Griffith in the UK and Oswald Avery in the USA showed that they were wrong; the chemistry of inheritance is carried in the nuclein molecule that Friedrich Miescher had isolated seventy years earlier.

Griffith at the Ministry of Health in London made the crucial breakthrough when working with bacteria that cause pneumonia. He worked with *Streptococcus pneumoniae*, which has a virulent and harmless form (S and R) because the former is enclosed in a capsule that protects the bacterium from the immune response of the body and the latter does not. When injected into mice, the S-form kills them, while the R-form does not. Griffith then heated the S-form to kill it and sure enough, the dead bacterium did not kill mice. But when he injected mice with a mixture of dead S-forms and R-forms, he found that the latter had been transformed by a 'transforming principle' contained in the former into the lethal S-form. Furthermore, the transformation was heritable—i.e., able to be passed on to succeeding generations of bacteria. This was a result that was met with much scepticism because bacteriologists had believed that the types of bacteria were fixed and unchangeable, from one generation to another.[407]

Griffith announced the results of his experiments in 1928, but it was not until 1944 that Avery, working with Colin MacLeod and Maclyn McCarty at the Rockefeller Institute for Medical Research in New York, was able to identify Griffith's mysterious 'transforming principle'. Through a process of elimination, examining the organelles in cells one by one, they found that deoxyribonucleic acid (DNA) is the substance that causes bacterial transformation. They thus established that inheritance is contained within this molecule, not only in bacteria, but in all cellular forms of life.[408]

Following the end of the Second World War, the race was then on to discover how inheritance is carried within the structure of the DNA molecule. It is not a simple story to narrate for there were a number of personality clashes between the major participants, not the least between John Randall, Maurice Wilkins, and Rosalind Franklin. In 1946, the Medical Research Council in the UK appointed Randall as the Director of the Biophysics Research Unit at King's College to apply the experimental methods of physics to problems of biology. Randall appointed Wilkins, a physicist, as his deputy.

One of Wilkins' projects was to use X-ray imaging techniques to study the structure of the DNA molecule. For, as he explained in a video at the time, the wavelength of X-rays is similar to the distance between the atoms in the molecule, resulting in diffraction patterns that can be measured accurately. In 1951, Rosalind Franklin, an expert in X-ray crystallography, joined the team, meticulously creating around a hundred pictures, each of which took about ninety hours to produce.

Unbeknownst to Franklin, Wilkins showed one of these pictures—known as photo 51, containing a clearly defined X-shape—to James Watson in January 1953. This photo greatly helped Watson and Francis Crick at the Cavendish Laboratory in the University of Cambridge to show that the DNA molecule consists of a double helix with an alternating sugar-phosphate backbone, phosphorous being the distinguishing atom that Friedrich Miescher had discovered in nuclein in 1869. In between the two strands of the backbone are four bases: cytosine (C), guanine (G), adenine (A), or thymine (T), combining in pairs, C with G and A with T.

Therein lies the magic of the DNA molecule, revealing the secret of biochemical inheritance. When the two backbone strands separate in cell division, each generates its complementary DNA sequence

through the action of an enzyme called DNA polymerase. It is in this ingenious way that DNA molecules replicate themselves in both mitosis and meiosis.

When this simple model emerged in the minds of Crick and Watson in the morning of 28th February 1953, Watson was to say, "It was quite a moment. We felt sure that this was it. Anything that simple, that elegant just had to be right." In the Eagle pub next door to the Cavendish laboratory, Crick announced at lunchtime that he and Watson has found 'the secret of life', the subtitle of Watson's book *DNA*.[409]

Crick and Watson announced their momentous discovery in a one-page, one thousand-word paper published in *Nature* on 25th April 1953, which also included longer articles by Franklin and Wilkins supporting the correctness of the model. Crick and Watson were well aware of the significance of their discovery, for they modestly began their paper with these words: "We wish to suggest a structure for the salt of deoxyribose nucleic acid (D.N.A.). This structure has novel features which are of considerable biological interest."[410]

"But how is the information encoded in DNA—a molecular string of nucleotides, As, Ts, Gs, and Cs—converted into protein—a string of amino acids?" Watson asked. Well, this was a three-step process over a period of thirteen years.[411]

First, it was discovered that DNA is not directly linked to the amino acids in protein. Another nucleic acid called Ribonucleic acid (RNA) acts a messenger between the two in what Crick would later call the 'central dogma'. RNA is similar to DNA except that thymine is replaced by uracil, similarly binding to adenine.[412]

Secondly, there are twenty amino acids, so neither a single nucleotide nor a double one could encode all these acids, with just four or sixteen possibilities, respectively. The minimum encoding requires a triplet of bases, giving 64 combinations (4^3) with some redundancy. But a tetrad with 256 permutations would also work with even more redundancy. In the event, in 1961, Sydney Brenner and Francis Crick did the definitive experiment that demonstrated that the code is triplet-based, the triplets being called 'codons'.[413]

But what was the code? Well, Marshall Nirenberg and J. Heinrich Matthaei made the crucial breakthrough in 1961 using a technique developed by Marianne Grunberg-Manago to produce strings of nucleotides like AAAAAA or GGGGGG. They used the triplet UUU to show that it encodes phenylalanine. Gorbind Khorana then picked up the challenge of decoding the other 63 triplets or codons, which led to the unravelling of the complete genetic code by 1966, listed here. As Watson tells us, "stop codons do what their name suggests: they mark the end of the coding part of a gene."[414]

The Genetic Code

Amino acid	**RNA codon**
Alanine	GCA GCC GCG GCU
Arginine	AGA AGG CGA CGC CGG CGU
Asparagine	AAC AAU
Aspartic acid	GAC GAU
Cysteine	UGC UGU
Glutamic acid	GAA GAG
Glutamine	CAA CAG
Glycine	GGA GGC GGG GGU
Histidine	CAC CAU
Isoleucine	AUA AUC AUU
Leucine	UUA UUG CUA CUC CUG CUU
Lysine	AAA AAG
Methionine	AUG
Phenylalanine	UUC UUU
Proline	CCA CCC CCG CCU
Serine	AGC AGU UCA UCC UCG UCU
Threonine	ACA ACC ACG ACU
Tryptophan	UGG
Tyrosine	UAC UAU
Valine	GUA GUC GUG GUU
Stop codons	UAA UAG UGA

So far, so good. However, it seems that the more the secrets of the DNA molecule that have been revealed, the more questions that remain unanswered. As Steve Jones, Professor of Genetics at University College, London has said, "We don't understand genetics at all."[415] Part of the problem here is that after the three billion bases of the human genome were sequenced using a technique developed principally by Fred Sanger,[416] it was discovered that only 2% of the genome

contains genes that encode protein. So what does the other 98% of noncoding DNA, sometimes called 'dark matter', actually do? Furthermore, it is not only the language that is significant, the very shape of the DNA molecule—its physical structure as it folds around on itself—is causal.[417]

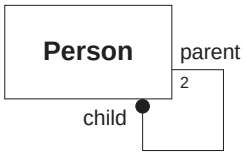
To make further progress in understanding the workings of the cell, cell biologists need to view the inter- and intra-relationships of cells as an information system. This means learning a couple of little know facts about information understood by information systems architects, semioticians, and cognitive scientists. First, information is data with meaning, as we see on page 36. Secondly, the signs and symbols of information, accessible through the aural and visual senses, are quite distinct from the concepts they signify in the noosphere, encapsulated in the meaning triangle, depicted on page 63.

Furthermore, it is vitally important to view the role that cells play in biogenesis in the context of all evolutionary processes in the Universe, remembering that time is an illusion, just an appearance in Consciousness. So the Numinosphere and noosphere are not just present in human learning. They have been omnipresent throughout the entire evolution of the biological species, a process that actually takes place in the Eternal Now.

What new insights will be revealed to cell biologists through such introspection only time will tell. But maybe we can learn a little from the discoveries that have been made during the past three and a half centuries in the noosphere, stumbling along because progress has often been held back by entrenched beliefs that make little sense in the clear light of day.

Evolutionary hierarchies

As it is believed that cells play the central role in evolution, in the inheritance of characteristics in both ontogeny and phylogeny, it is now time to look at the third type of hierarchy in Integral Relational Logic: evolutionary relationships between organisms and species through time.



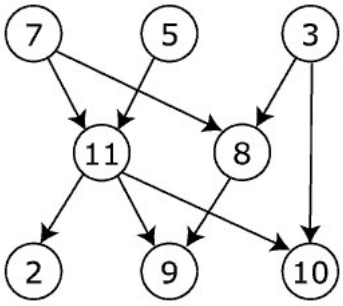
To begin this investigation, I start with myself, with my own family tree. However, I cannot represent my ancestors and descendants in a class diagram, which I can with generalization and aggregation hierarchies, for this is the diagram that results. To view ontogenetic hierarchies we need instance diagrams, illustrating the relationships between particulars rather than universals, called entities and classes in Integral Relational Logic.

For myself, I spent a couple of years at the end of the twentieth century after taking early retirement from IBM in Stockholm to study the familial and cultural influences in my development. As many have found, tracing family history is a fascinating, addictive hobby. For every time one finds another ancestor, one is pulled to find their parents, as far back as records exist or are readable. I began this exercise in 1969, shortly before my daughter was born, because I was then working for IBM in the City of London, close to repositories of indexes of births, marriages, and deaths and microfilms of census records. But without a personal computer, searching records and organizing the results was far too time-consuming. Even thirty years later, the facilities available today were comparatively limited, as this pastime has taken off in recent years, turned into a big business.

Be that as it may, I discovered that I have thirty distinct great great great grandparents not thirty-two (2^5) because two of my great grandparents were first cousins. So the idea that each of us has two parents and each of them had two parents, and so on and so forth doesn't actually hold for long. We can see this even more clearly if we go back a thousand years, about thirty-three generations. For this would give each

of us eight billion ancestors, far more than the 300 million people living on Earth around 1000.[418] We are all cousins under the skin, one big not-so-happy family.

But there is no need to stop with just human ontogenetic evolution in the biosphere. As individuals, we have maternal and paternal ancestors going back around a billion years, to the birth of sexual reproduction. And before that, we are descendants of individual bacteria and archaea, even before the nucleus formed in cells.



So while it would appear that family-tree structures are hierarchical, both backwards and forwards in time, as *tree* indicates, mathematically they are actually directed acyclical graphs (DAG), with any one node emanating from two nodes, partially illustrated here,[419] a special case of a mathematical graph, depicted on page 38. In other words, there is a flow between the nodes in one direction, which does not flow back on itself to form cycles. Such DAGs are useful in other fields, such as dataflow programming languages used in investment banking.[420] DAGs are thus special cases of the underlying structure of the Universe, which is cyclical and not directed.

Because we are all cousins of each other in some way, the question then arises do we have a single ancestor in common? In genetic evolution theory, such an ancestor is called a last common ancestor (LCA) or most recent common ancestor (MRCA).

So do we human beings have an MRCA? Well, let us look at a simple example, the seven reigning monarchs in Western Europe: Harald, King of Norway; Carl XVI Gustav, King of Sweden; Margrethe II, Queen of Denmark; Elizabeth II, Queen of England (and other countries); Willem-Alexander, King of Netherlands; Philippe, King of the Belgians; and Felipe VI, King of Spain. Harald, Carl Gustav, Margrethe, Elizabeth, and Felipe VI are all descendants of Queen Victoria of England (1891–1901) and Albert (1819–1861), while Harold, Margrethe, Elizabeth, and Philippe are all descendants of King Christian IX of Denmark (1818–1906) and Louise (1817–1898). But we need to go back to George II of England (1683–1760) and Caroline (1683–1737) to find an MRCA for all these monarchs.

In general, if we took any group of people on Earth, it is highly likely that a common ancestor exists for such a group. But what about the total population? Well, my intuition tells me that we are descendants of a small group of *Homo sapiens*, who evolved from whatever hominid species that is considered to be the parent of our own. But now we are moving from the evolution of particulars to that of universals, from ontogeny to phylogeny.

The evolution of Indo-European languages from a Proto-Indo-European common ancestor some 7,000 years ago is an example of the evolution of generalities.[421] The philologer and jurist William Jones was the first to notice the similarities in the languages spoken by around half the population of the planet, giving a lecture to the Asiatic Society in Calcutta on 2nd February 1786, published two years later:

> The *Sanscrit* language, whatever be its antiquity, is of a wonderful structure; more perfect than the *Greek*, more copious than the *Latin*, and more exquisitely refined than either, yet bearing to both of them a stronger affinity, both in the roots of verbs and the forms of grammar, than could possibly have been produced by accident; so strong indeed, that no philologer could examine them all three, without believing them to have sprung from some common source, which, perhaps, no longer exists; there is a similar reason, though not quite so forcible, for supposing that both the *Gothick* and the *Celtick*, though blended with a very different idiom, had the same origin with the *Sanscrit*; and the old *Persian* might be added to the same family, if this were the place for discussing any question concerning the antiquities of *Persia*.[422]

It is not easy to determine the homeland of a hypothetical Proto-Indo-European people and when they lived there. The best educated guess that linguists seem to have made is that they lived north of the

Black and Caspian Seas in the late Neolithic period some 7,000 years ago, spreading across Asia and Europe, as this map of the Indo-European peoples around 500 BCE indicates.[423]

Since then, linguists have found patterns of development in languages in a related group as consonants and vowels change in a consistent manner, not unlike changes in the nucleotides in the DNA molecule. One notable example is Grimm's Law, established in 1822 by Jakob Grimm, the elder of the Brothers Grimm, who saw patterns in the way sounds change from a supposed Proto-Germanic language within the Proto-Indo-European family of languages.[424]

These are changes made in general structures. But it is individuals who speak and articulate languages. So we see here a clear example of the way that the environment affects evolution. As this is a universal principle, it applies just as much in biogenesis as it does in cultural evolution. But now I feel it helps to distinguish common ancestors in ontogeny and phylogeny. I would suggest that we use MRCA in ontogeny and LCA in phylogeny, the latter also being called concestor by Richard Dawkins at the suggestion of Nicky Warren.[425]

Regarding ontogeny, it would appear that rather than evolution diverging backwards in time, with more and more ancestors, it has actually converged in a single cell, an MRCA for all individual organisms that have ever lived on Earth. Conversely, looking forward in time, evolution has diverged, as we see in descendant diagrams in family history programs.

But what about speciation, as individuals evolve in a somewhat different manner from their parents? At such times, phylogeny recapitulates ontogeny rather than the other way round. The conventional modern evolutionary synthesis seems to have evolved from two books written during the second world war by Julian Huxley and Bernhard Rensch, an Englishman and German: *Evolution: The Modern Synthesis* and *Evolution Above the Species Level*, respectively.

Huxley summarized the broad sweep of evolutionary processes in a paper he wrote for *Nature* in 1957 titled 'The Three Types of Evolutionary Process'. He called these macro patterns in evolution *cladogenesis*, *anagenesis*, and *stasigenesis*, denoting the processes leading to divergence, improvement, and persistence, respectively. Rensch had coined the term *cladogenesis* (with a *k*) from Greek *klados* 'branch', to indicate the way a group of organisms evolve from a common ancestor in a hierarchical manner.[426] This is in contrast to *anagenesis*, a word coined in the late 1800s, to denote the widespread belief that species evolve gradually from other species in a continuous process.

Stasigenesis, on the other hand, is a misnomer, for the word derives from Greek *stasis* 'standing, station, stoppage', which is not evolutionary at all. A more appropriate word is *homeostasis*, from Greek *òmoios* 'of

the same kind, like, similar', meaning 'the ability or tendency of an organism or cell to maintain internal equilibrium by adjusting its physiological processes'.

Nevertheless, here are Huxley's definitions of these three evolutionary processes, as he saw them:

- **Cladogenesis** denotes all splitting, from subspeciation through adaptive radiation to the divergence of phyla and kingdoms.
- **Anagenesis** denotes all types or degrees of biological improvement, from detailed adaptation to general organizational advance or perfection of some major function.
- **Stasigenesis** denotes all processes leading to stabilization and persistence of types and of patterns of organization, from species up to phyla.[427]

We see similar patterns in the noosphere. Often ideas emerge gradually, like the development of an old-fashioned chemical photograph. They are fuzzy at first, not fully articulated. It takes time for this to happen. But sometimes ideas emerge fully formed in an aha, eureka moment, when the 'penny drops'. Thirdly, ideas and beliefs become so deeply entrenched as scientific, religious, and economic dogmas that it becomes extremely difficult for evolution to develop further.

Since the early 1980s, I've been viewing all the species between *Homo sapiens* and chimpanzees as fuzzy ones, as they are all extinct, like fuzzy ideas. If I were to look through all my writings of the past thirty-five years, I am sure that I would find many examples of this learning process. However, the one idea that I suddenly had on 27th April 1980 that data patterns in the Universe are synergistically causal has not changed very much. It is has simply evolved into the universal principle that meaningful, structure-forming relationships are energetic, as an example of the Principle of Unity, the common ancestor of all ideas in the noosphere. This is one idea that has not become extinct, for it is universal.

However, how such an idea has evolved cannot be explained in terms of any of Huxley's three types of evolutionary processes. For the Hidden Harmony, as the fundamental design principle of the Universe, has emerged directly from the Divine Origin of the Universe. It is then destined to return to its Alpha Point, more through evolutionary convergence than divergence, implied by the term *cladogenesis*.

Such a convergent evolutionary process can perhaps be best called *arogenesis*, from PIE base **ar-* 'to fit together', also root of *harmony* and *order*. I discovered the word *arogenesis* in August 2015 in *Concepts of Symbiogenesis* by Liya Nikolaevna Khakhina, edited in English translation by Lynn Margulis and Mark A. McMenamin. The book describes the work of Russian biologists in the Soviet Union in developing the theory of symbiogenesis—the evolution of novelty by the integration of partners living in symbiosis. As the editors say in their introduction, "eukaryotic cells (those of plants, animals, fungi, and protoctists) evolved from the symbiotic union of two or more types of once free-living prokaryotic microbes (bacteria). This simple idea with far reaching implications languished for decades in the West, entirely apart from mainstream scientific thought."[428]

Regarding *arogenesis*, the editors thought that it refers to the evolution of complexity in the organic world throughout life's history, corresponding to Teilhard's concept of complexification without his teleological connotations. This is Khakhina's definition of this vitally important word, applicable as it is in all forms of the evolution of structure:

> Arogenesis refers to the trend of evolution proceeding in the direction of a higher level, that is, a more perfect organization (progressive evolution). The principal feature of arogenesis consists of acquisition, accumulation, and perfection of a whole complex of adaptations having great ecological significance. Morphologically and physiologically, arogenesis involves the increase in complexity of the organization of an individual.[429]

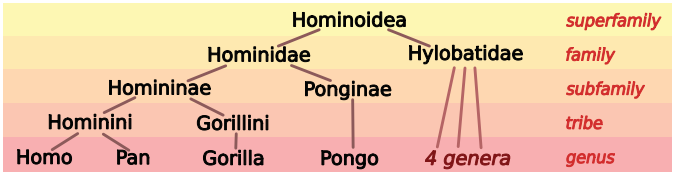
Khakhina then likened the word to Rensch's *anagenesis*, which seems to lack the notion of novelty implicit in Margulis and McMenamin's concept of *symbiogenesis*. There is thus clearly much work to be

done here, for as Lynn Margulis said in one of her books (I forget which), even among biologists there is, as yet, no agreement on an evolutionary synthesis that matches all the evidence, free of all dogma.

For myself, I did spend a little time studying cladistics a few years ago, defined in one dictionary as 'A system of classification based on the phylogenetic relationships and evolutionary history of groups of organisms'. However, I did not make a clear distinction between generalization and evolutionary hierarchies and so muddled the taxonomic and temporal dimensions of such structures. Furthermore, evolutionary hierarchies are essentially ontogenetic, like our family trees, illustrating the relationships between individual organisms through time. So what does a phylogenetic evolutionary hierarchy mean? Well, it seems to be both a way for us to organize our ideas and an evolutionary model of classes of organisms, whatever this means. It is interesting to note here that Lynn Margulis and Karlene V. Schwartz made no reference to cladistics in their own taxonomy of the phyla: *Five Kingdoms*.

In contrast, Richard Dawkins' *The Ancestor's Tale: A Pilgrimage to the Dawn of Life* identifies thirty-nine different LCAs going back some four billion years to the earliest single-cell organisms. The book is so named because it is "cast in the form of an epic pilgrimage from the present to the past" inspired by Chaucer's *Canterbury Tales*, there being fifty-nine pilgrims' tales, the number of pilgrims being swelled at each step in the journey backwards in time.

The central issue here is that neo-Darwinists seem to believe that all developments in the observable characteristics of organisms are caused by random mutations in the DNA molecule. But there is overwhelming evidence from questioning biologists that such an explanation is very far from the mark. Furthermore, the history of ideas in the noosphere during the past few thousand years has not been caused by individuals' DNA molecules.



The central concept in cladistics is that of clade, defined as 'a group of organisms that have evolved from a common ancestor'. Clades are depicted in cladograms, consisting of a common ancestor and all its lineal descendants, which represents a single branch on the tree of life. Here is an example of the ape clade, showing the relationship of *Homo sapiens* to the greater and lesser apes, families Hominidae and Hylobatidae, which contains four genera of gibbons.

But what does this diagram actually mean? It purports to be a taxonomy of the species in a generalization hierarchy, like those in object-oriented programming languages, passing on generalized attributes, properties, or characteristics to more narrowly defined classes. Historically, these characteristics have defined *phenotype* as 'a type of organism distinguishable from others by observable features', from Greek *phaino-* 'shining' from *phainein* 'to show'.

However, following the discovery that chromosomes contain hereditary information, in 1911 Wilhelm Johannsen proposed the term *genotype* as 'the genetic constitution of an individual, especially as distinguished from its phenotype', also coining the word *gene* in the process. But I sense some confusion here. Is a genotype 'the sum-total of the genes in an individual or group', as the OED suggests, or individual genes that determine characteristics like the colour of eyes?

I have seen examples of the latter use of *genotype*,[430] which might make logical sense if the colour of eyes is a defining attribute in Integral Relational Logic. But I take it that as often as not such characteristics are nondefining attributes. We can see an example of this situation in the long-held assumption that swans are white. It would appear that whiteness was a defining attribute of swans until black swans were found in Australia. But now this property is a prototypical attribute.

Furthermore, in Mendelian genetics, characteristics in the phenotype are determined by single genes whereas many characteristics are polygenetic, in a manner that it is not easy to determine, as some biologists admit. So even though G. H. Haggis wrote in 1964 in *Introduction to Molecular Biology*, "It is necessary to distinguish between the assemblage of outwardly recognizable traits by which an individual is defined, known as its phenotype, and the assemblage of inherited factors which determine these traits, known as its genotype,"[431] actually making this distinction is not easy.

We can see the difficulties that can arise when conflating generalization and evolutionary hierarchies in the class Pisces, for all fish species do not fit neatly into a clade that includes them all and excludes all species that are not fish.[432] Class Reptilia is not a clade because it does not include class Aves, the birds, which have a common ancestor with lizards and crocodiles. One way round this problem is to use the term *Sauropsida* as the clade that includes both the reptiles and birds. Sauropsida was the second of the three primary groups of Vertebrata in T. H. Huxley's *Classification of the Animals* published in 1870, the other categories being Ichthyopsida, fishes and amphibians, and Mammalia.[433]

In summary, when the taxonomy of both phenotypes and genotypes match, the clade is called monophyletic, such as classes Mammalia and Aves. If a clade includes some, but not all its descendants, like class Reptilia, it is paraphyletic. Reptilia are the clade Sauropsida minus the clade Aves. A defining attribute, such as warm-blooded, can lead to a polyphyletic group, having evolved independently of genetic considerations. Endotherms thus consist of class Mammalia plus class Aves.[434] It seems that taxonomists today favour monophyletic structures, disparaging paraphyletic and polyphyletic ones, for these are easier to understand. But where does this leave the taxonomy of the species? In a rather confused state, as I see the situation.

Bringing Life back to biology

All these taxonomic and evolutionary issues pale into insignificance when we consider the common ancestor for all the species, for all cellular forms of life. As all cells during the past three and a half billion years have developed from previous cells, where did the first cell come from? This is similar to the question I asked myself in the late 1970s about the development of programs. As all programs come into existence with the help of other programs, where did the first program come from?

Today, there are some scientists attempting to create new cells from a primordial goo, from what they consider as the basic constituents of cells, which they suppose existed before the first monocellular organisms. Others hypothesize that life arrived on Earth in the form of spores from outer space in a process sometimes called 'directed panspermia'.[435] "However, this does not solve the problem of the origin of life, but only displaces it into space," as Werner Schwemmler wrote in *Symbiogenesis*, when attempting to develop a unified theory of evolution.[436]

The central issue here is the second law of thermodynamics in physics, which states, in one form, "The entropy of an isolated system never decreases, because isolated systems always evolve toward thermodynamic equilibrium, a state with maximum entropy." Put more simply, "The second law states that heat does not of itself pass from a cooler to a hotter body." In technical terms, "The entropy of a closed system can only increase," entropy being a measure of disorder. In other words, once hot and cold water are mixed in a basin, it is not possible to unmix them without an external source of energy.

This law arose in the nineteenth century through the study of heat engines and has since then been assumed to be a universal law because thermodynamics is "the branch of physical science that deals with the relations between heat and other forms of energy (such as mechanical, electrical, or chemical energy),

and, by extension, of the relationships between all forms of energy".[437] The second law is today enshrined as the central dogma of materialistic science, which Arthur Eddington expressed thus:

> The law that entropy always increases—the second law of thermodynamics—holds, I think, the supreme position among the laws of Nature. If someone points out to you that your pet theory of the universe is in disagreement with Maxwell's equations—then so much the worse for Maxwell's equations. If it is found to be contradicted by observation—well, these experimentalists do bungle things sometimes. But if your theory is found to be against the second theory of thermodynamics I can give you no hope; there is nothing for it but to collapse in deepest humiliation.[438]

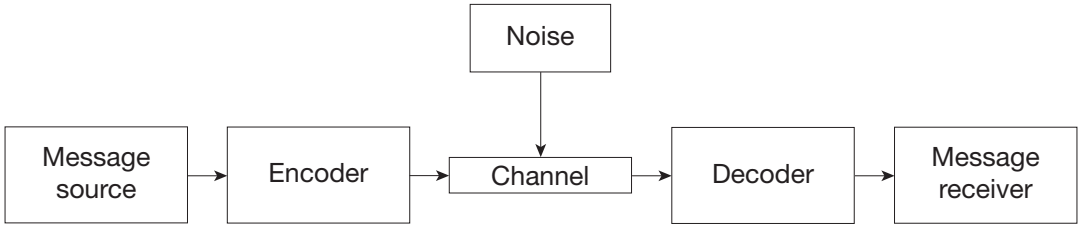
So, as Brian Cox said in the 'Destiny' episode of his BBC documentary series *The Wonders of the Universe* in 2011, "Entropy always increases, because it's overwhelmingly likely that it will."[439] He thus believes in the 'heat death of the universe', a one-sided vision of the Universe that had a profoundly negative effect on the optimism of the late nineteenth and early twentieth centuries, as the historian of science Stephen Brush has pointed out.[440]

We can begin to resolve this dilemma by calling on the Principle of Unity, the fundamental design principle of the Cosmos. It is then natural and commonsensical to say that in a system where organization and complexity increase, there is an increase in available energy and a corresponding decrease in entropy. But this is not something that most scientists can accept. For instance, Norbert Weiner, the author of *Cybernetics: or Control and Communication in the Animal and the Machine*, asserted: "Information is information, not matter or energy. No materialism which does not admit this can survive at the present day."[441]

Weiner made this statement because in 1948, Claude Shannon, confusingly known as 'the father of information theory', wrote a paper called 'A Mathematical Theory of Communication'. At the time, he was working for Bell Telephone Laboratories, being concerned about the effects of noise in a communications channel when using pulse-coded modulation (PCM) or pulse-position modulation (PPM). For telephone communications were then marking the dawn of the digital age, as analogue signals were destined to become digitized. As he said,

> The fundamental problem of communication is that of reproducing at one point either exactly or approximately a message selected at another point. Frequently the messages have *meaning*; that is they refer to or are correlated according to some system with certain physical or conceptual entities. These semantic aspects of communication are irrelevant to the engineering problem. The significant aspect is that the actual message is one selected from a set of possible messages. The system must be designed to operate for each possible selection, not just the one which will actually be chosen since this is unknown at the time of design.[442]

Here is Shannon's basic model of a communications channel, using terms from *Encyclopædia Britannica*, as these are more meaningful.[443]



You can see that this model is essentially mechanistic, acting in the horizontal dimension of time, like the input-function-output process of computers, depicted on page 7. So it is misleading to use the word *information* in this connection, as Theodore Roszak has pointed out in *The Cult of Information*.[444] For the essence of information is to inform and to provide meaning. So the concept of information is essentially semantic, not mathematical. For when we view information mathematically, it becomes "disjointed matters of fact that [come] in discrete little bundles."[445]

As Shannon admitted in an article he wrote for a now obsolete edition of the *Encyclopædia Britannica*, "The signals or messages need not be meaningful in any ordinary sense."[446] Communications theory is not concerned with the meaning of the information in messages, but solely with signs, codes, and the quantitative measurement of these entities in a mechanistic, stochastic sense.

We are now entering the murky waters of probability theory for the first time in this dissertation, murky because the probability of any happening is dependent on the psychological expectations of that event. In the case of a coin, a pair of dice, or a pack of cards, the *a priori* set of circumstances are crystal clear. So the probability of a tossed coin being heads, of a seven being thrown in dice, or a hand in bridge being dealt four aces is readily calculated. However, the prior probabilities are often not known in practice, which can lead to considerable difficulties with probability theory, as we see later.

In terms of communications theory, we can consider a message to consist of a sequence of letters, which need to be encoded in some way in a communications channel. In the case of the English language, there are twenty-six letters, which occur in words with a wide variety of frequencies. So Shannon thought that if letters with a high probability of occurring, such a *e*, could be encoded with fewer bits than the letter *z*, for example, then the efficiency of the channel could be optimized. Remember, at the time, communications channels were extremely limited, unlike today. Even twenty years after Shannon published his theory, when I learned to write a program in assembly language on an IBM course to communicate with a typewriter terminal, we used a line of just 600 bits per second.

To this end, Shannon developed a probabilistic formula for the number of bits each message would need, which D. S. Jones and Myron Tribus called *self-information*[447] and *surprisal*,[448] respectively. This latter term is most meaningful, for the less likely a message, the more surprising it is and the more characters are needed to transmit it. For instance, if a message is considered impossible, an infinite number of signs are required. On the other hand, if we are told something that we already know, no signs are required. That, in essence, is why this treatise is so long. While the life experience on which it is based is not impossible, as some believe, it is highly improbable given most people's *a priori* expectations.

W. Ross Ashby used a related function to define what he called *variety*, which measures the number of distinguishable elements in a set. For instance, the variety of a coin, with just two possibilities, is less than the variety of the English alphabet or a pack of playing cards, in which there are twenty-six and fifty-two members, respectively.[449]

However, this does not take into consideration the different probabilities of the various elements in the set. So Shannon sought an expression for the weighted average of the set as a whole, which would denote its degree of uncertainty, which he denoted with the letter *H*. When all elements are equally likely, *H* is a maximum, equal to the variety of the set, in Ross Ashby's terms. *H* reaches a minimum of zero when all the probabilities except one are zero.[450] For then there is no uncertainty; we know with certainty what message will be received. But what name could Shannon give to this mysterious quantity *H*? Well, this is what he himself said:

> My greatest concern was what to call it. I thought of calling it 'information', but the word was overly used, so I decided to call it 'uncertainty'. When I discussed it with John von Neumann, he had a better idea. Von Neumann told me, "You should call it entropy, for two reasons. In the first place your uncertainty function has been used in statistical mechanics under that name, so it already has a name. In the second place, and more important, nobody knows what entropy really is, so in a debate you will always have the advantage."[451]

Indeed, *H* was chosen to denote entropy because this is the sign that Ludwig Boltzmann had used in developing his theory of statistical thermodynamics in 1872, rather than *S*, as Rudolf Clausius had used seven years earlier, when introducing this rather abstruse term. But then Weiner introduced some

confusion. He wrote, "Just as the amount of information in a system is a measure of its degree of organization, so the entropy of a system is a measure of its degree of disorganization; and the one is simply the negative of the other."[452] Thus the terms *negative entropy* and *negentropy* entered the literature. But this was unnecessary, for Shannon had added a minus sign in his formula to make *H* positive, while Weiner did not. As Ross Ashby has pointed out, while "Both regard information as 'that which removes uncertainty', and both measure it by the amount of uncertainty it removes,"[453] Shannon's formula for entropy was positive, while Weiner's was negative.

Even though entropy is not an easy concept to grasp, we can see its central role in our lives from its roots, which are Greek *en-* 'inside' and Greek *tropē* 'transformation'. Today, we are a species in transformation—the transformation of culture and consciousness, which is leading us Home to Wholeness as a species.

Stanislav Grof has denoted this holistic process with the neologism *holotropic* 'turning towards the whole', modelled on *heliotropic* 'turning towards the sun', from Greek *ὁlos* 'whole' and *tropos* 'turn', from *trepo* 'to turn', cognate with *tropē* 'transformation'. However, *trepo* has two meanings, as in English: 'to change direction' (as in 'turn into a side-road'), and 'to change form' (as in 'turn into a frog').[454] So *holotropic* can be said to have two meanings, the second being 'transforming the Whole', using *-tropic* in the same sense as *entropic* 'in transformation'.

However, not regarding the noosphere and Numinosphere as within the domain of science, biologists have been seeking mechanisms within the biosphere to explain how the complexity of forms and structures increases in evolutionary processes. Central to this explanation is Humberto Maturana and Francisco Varela's notion of living machines, which they called self-organizing or self-creating when introducing the concept in 1972. In technical terms, they called this process *autopoiesis*, from the Greek *poien* 'to make, do, produce, create', which is also the root of *poetry*. To them, autopoietic machines are homeostatic machines, with one peculiarity:

> An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (ii) constitute it (the machine) as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network.[455]

As the systems theorist, Fritjof Capra, tells us in *The Web of Life*:

> Maurana and Varela began their essay on autopoiesis by characterizing their approach as 'mechanistic' to distinguish it from vitalist approaches to the nature of life: 'Our approach will be mechanistic: no forces or principles will be adduced which are not found in the physical universe.' However, the next sentence makes it immediately clear that the authors are not Cartesian mechanists but systems thinkers: 'Yet, our problem is the living organization and therefore our interest will not be in properties of components, but in the processes and relations between processes realized through components.'[456]

Lynn Margulis and Dorion Sagan have used the concept of autopoiesis to argue that the increase in organization in biological systems is not contradictory to the second law of thermodynamics. As they say, "Life does not exist in a vacuum but dwells in the very real difference between 5800 Kelvin incoming solar radiation and 2.7 Kelvin temperatures in outer space. It is this gradient upon which life's complexity feeds." So while classical thermodynamics is concerned with closed systems, what they call the 'new' thermodynamics is influenced by the environment in which organisms are born, thrive, and die. So, in a sense, they say that informational 'self'-organization should really be called 'other'-organized. "The tendency of systems to organize comes from the gradients in their immediate surroundings, not from their own internal components'."[457]

Margulis bases her convergent view of view of evolution on this autopoietic worldview. As she writes in her scholarly work *Symbiosis in Cell Evolution*, "The symbiotic theory of the origin and evolution of cells rests on two concepts of biology." The first is the division between prokaryotic and eukaryotic organisms, the basis of her five-kingdoms taxonomy, outlined above. Secondly, some organelles in eukaryotic cells were once free-living bacteria, which cells with a nucleus within them acquired symbiotically. This is in contrast to the conventional divergent view of cellular evolution, in which organelles in cells evolved by compartmentalization, through a process of direct filiation.

It is here we see the direct influence of social attitudes in the development of scientific theories. On the one hand, evolutionists see increasing divergence in society, as scientists become ever more specialized. In contrast, evolutionaries are participating in a convergent view of evolution, as Carter Phipps describes in *Evolutionaries*, much influenced by Teilhard's brilliant evolutionary worldview.

However, I have yet to read of any biologist working in academia who is ready to admit Teilhard's Divine *Milieu* into science, including both the inner and outer, both the centre and environment of the biosphere, contained with the noosphere and Numinosphere. For to do so, scientists would need to admit Life, arising directly from the Divine Origin of the Universe, into science. And as science is constituted today, any scientist who acknowledged that Life is the Ultimate Cause of all beings in the relativistic world of form would most probably be ostracized by her or his colleagues, even losing their jobs.

It is for this reason that there is still, as yet, no satisfactory explanation for speciation in the so-called life sciences. It is only when we admit Life into science in a nonmechanistic manner that we can understand how new forms emerge that never existed before. It was Life that created the first cell, just as it created the first program.

In *Process and Reality*, when studying the concept of the Ultimate, Alfred North Whitehead called this creative evolutionary process *concrescence*, from the Latin *cum* 'together with' and *crēscere* 'to grow', pointing out that creativity is the principle of *novelty*.[458] This growing together produces forms and structures that are quite new, that have never been seen before, such as this book you are reading now.

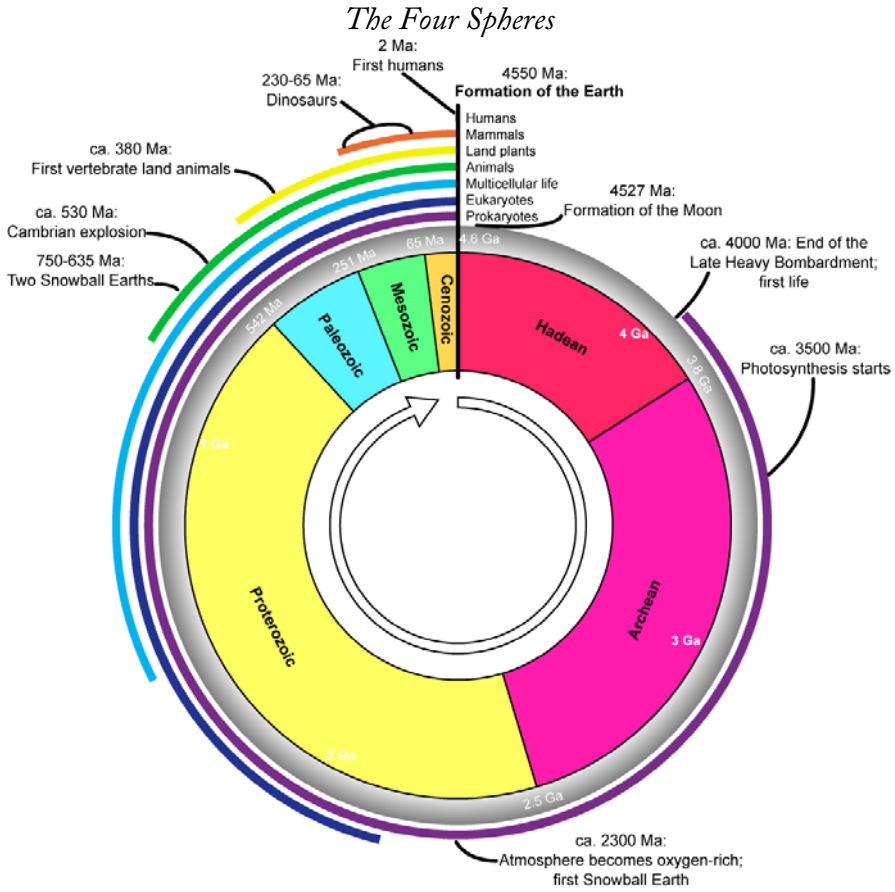
The rate of growth of structure

The final point we need to look at in this brief mapping of the biosphere is the rate of growth in the complexity of forms and structures, for this tells us much about the accelerating rate of evolutionary change in the world today and our future as a species.

To see this big picture, I feel it helps to relate it to the eons and epochs of geological time, as the next diagram from Wikipedia illustrates. However, because evolutionary change is accelerating faster and faster, it is not easy to picture events during the past million or thousand years in such a diagram.

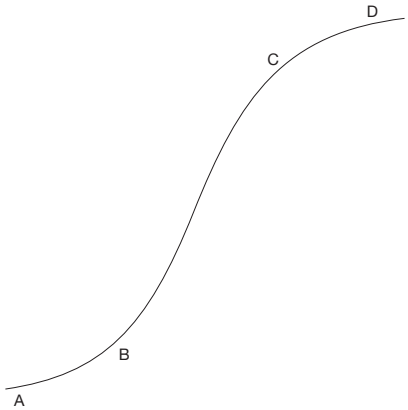
To reflect human influences on the Earth, some geologists have proposed that the Holocene geological epoch, meaning 'entirely recent', from Greek *ὅlos* 'entire, whole', is being followed by an Anthropocene epoch, from Greek *anthrōpos* 'human being'. However, this term is not yet fully accepted, perhaps because there are several proposals when it actually began. Some think that the Anthropocene is coeval with the Holocene, beginning when our forebears stopped being hunter-gatherers and began to cultivate the soil and domesticate animals. Others suggest later dates, up to the beginning of the Industrial Revolution, in the middle of the eighteenth century.[459] But such considerations take us into the noosphere, whereas we are focusing attention on the rate of change in the biosphere in this subsection.

The seminal work in this regard is D'Arcy Wentworth Thompson's *On Growth and Form*, first published in 1917, revised in two volumes in 1942. For me, the most important chapter in this book is the



208-page 'Rate of Growth', illustrating Thompson's brilliant skills as a mathematical biologist. Yet, you will learn very little about rate of growth in John Tyler Bonner's 1961 abridgement of *On Growth and Form* for the subject of growth is almost completely ignored,[460] perhaps because of the mathematics involved.

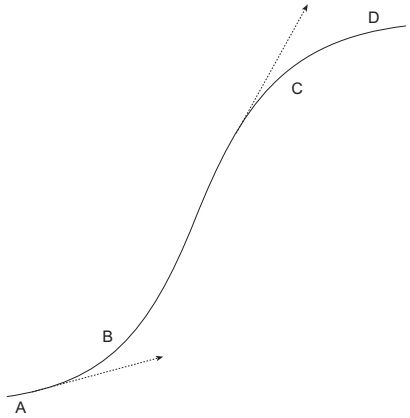
Yet it is not actually necessary to understand the mathematics to understand the basic principles. As the semantic concept of concept is more fundamental than the quantitative concept of number, this is one example where mathematics can get in the way of understanding. Furthermore, growth rarely follows a predictable course that can be accurately measured, like solar eclipses. So even when the pure mathematics is understood, applying the formulae does not necessarily add meaning.



All we really need to know is that the growth of form does not progress steadily at an unchanging rate. Development generally follows the S-shape of the growth curve, depicted here, the left-hand side of the growth-and-decay diagram of the Cosmological Cycle on page 6. In mathematical terms, the sigmoidal shape is the integral of the bell shape depicted there. But we don't need to dwell on this here.

It was this growth curve that triggered my interest in the 1970s into what is causing technologists, like myself, to drive the pace of change in society at exponential rates of development. At the time, I called it the learning curve, which is just a special case of the general principles involved. At the beginning, from A to B, the curve is rather flat, as the constituents that will form the evolving structure begin to coordinate with each other, In terms of human learning, when beginning a new project, it is easy to give up, saying, "I'll never manage this." Eventually, we learn to coordinate the necessary skills and ideas at B, the coordination point, and learning progresses at exponential rates of development. But structures do not

continue evolving indefinitely. Towards the end of any growth process, they reach a plateau at point C, the saturation point.



It is vitally important to understand the full shape of the growth curve, not extrapolating the various rates of change at different stages, depicted here. Most significantly, when growth is happening very fast, we might think that it can continue indefinitely, such as the deluded belief that technological development can drive economic growth indefinitely in today's capitalist society. Gordon E. Moore, the initiator of Moore's law and cofounder of Intel, is well aware of the limits of evolutionary growth. As he told a meeting of the world's top chip designers and engineers on 10th February 2003, "No exponential is forever." Irrationally, he then went on to say, "Your job is to delay forever."[461]

Around 1980, I came across the growth curve in *The Penguin Dictionary of Economics*, where it was called the 'logistic curve' for a reason that I did not understand. But its economic use is simply illustrated. When a new product is introduced into the marketplace, sales sometimes grow rather slowly at first until the product 'takes off'. There is then a period of rapid growth until the product reaches its saturation point. Such a saturation point is often determined by the finite population or number of households, where one refrigerator or vacuum cleaner, for instance, is quite enough.[462]

Indeed, as I have since discovered, it was Pierre François Verhulst who referred to the sigmoidal curve as the logistic function in 1845, when studying Malthusian limits of population growth. To celebrate the two hundredth anniversary of Verhulst's birth, acknowledging his critical contribution to the history of ideas, a group of scientists held a conference in September 2004 at the Royal Military Academy of Belgium in Brussels, where Verhulst worked, under the patronage of the King of the Belgians.

They published some of the papers presented there in *The Logistic Map and the Route to Chaos*, showing how Verhulst's formula has evolved into the mathematics of chaos theory. In this book, Hugo Pastijn suggests that the logistic function is so called because it is based on Greek *logisticos* 'art of computation', perhaps one meaning of the French word *logistique* at Verhulst's time.[463] Yet, despite the central importance of the logistic function for understanding what is happening to humanity at the present time, there is no mention of Verhulst in any of my four books on the history of mathematics.

In contrast, D'Arcy Thompson made much use of Verhulst's logistic curve in his chapter on the rate of growth in biological processes, pointing out that this one curve recurs in endless shapes and circumstances, for mathematics generalizes and "is fond of giving the same name to different things".[464]. For instance, he pointed out that it appears in hysteresis, where the value of a physical property lags behind changes in the effect causing it, as for instance when magnetic induction lags behind the magnetizing force.

However, it seems that biologists were slow to accept that the logistic function applies to biogenesis, just as it does to noogenesis. On 2nd November 1971, Niles Eldredge and Stephen Jay Gould presented a paper at the annual meeting of the Paleontological Society and the Geological Society of America titled 'Punctuated Equilibria: An Alternative to Phyletic Gradualism'.[465] At the time, the general consensus among palaeontologists and biologists was that evolution progresses gradually. But this does not explain why there are large gaps in the fossil record. There are long periods of virtual standstill (equilibrium), punctuated by episodes of very fast development of new forms. In actuality, evolution progresses in fits

and starts, for as Eldredge put it in his book *Time Frames*, "once a species evolves, it will not undergo great change as it continues its existence."[466] The same can be said about civilizations.

Yet, even then, they did not mention the growth curve and neither did Niles Eldredge in his book *Time Frames*. C. H. Waddington seems to be one of the first biologists to use the curve as a tool of thought in 1977.[467] In the same year, Stephen Jay Gould *did* mention it,[468] as did Peter Russell in 1995 in his evolutionary studies.[469]

Viewing biogenesis and noogenesis as one continuous process, the logistic curve and the related logistic difference equation in chaos theory[470] can help us understand why there have been a number of distinct turning points in evolutionary history, such as the birth of sexual reproduction and the emergence of Self-reflective Intelligence. However, as the time periods between these turning points diminishes geometrically, even an infinite number of them has a finite limit, as explained on page 127.

So what does this mean for the future of *Homo sapiens*, living in the biosphere? Well, from origin to extinction, the increase and decrease in human population schematically follows the same bell-shape of the logistic distribution curve as all other growth and decay processes. This curve is sometimes called the Hubbert curve, the derivative of the logistic curve, after M. King Hubbert, who studied it in order to point out that oil production, like any finite resource, rises to a peak and then diminishes to zero.[471]

Similarly, there are some signs today that the maximum human population that the Earth can sustain at the high levels of technology of the past two or three hundred years is reaching the saturation point in the growth curve, as depicted on page 138, and that later this century it will begin to decline rapidly. Yet, at the same time, the awakening of Love, Consciousness, and Intelligence is accelerating as the impediments to growth disappear. So, as evolution passes through the most momentous turning point in its fourteen-billion year history, we are witnessing *Homo sapiens* evolving into what some call *Homo universalis* and *Homo divinus*, as we learn to recapitulate the Cosmogonic Cycle, depicted on page 6.

But before this happens, we need to use Integral Relational Logic to map the hylosphere, the least significant of the Four Spheres that constitute the Universe.

6. The Hylosphere

The purpose of this chapter is to use the modelling methods of information systems architects in business and the Cosmic Equation—the simple, elegant equation that can explain everything—to show that physicists' conception of the Universe is misguided. In other words, if we are to intelligently manage our business affairs with full consciousness of what we are doing, we need to view the hylosphere, as the physical universe, in and on the Contextual Foundation of the Numinosphere.

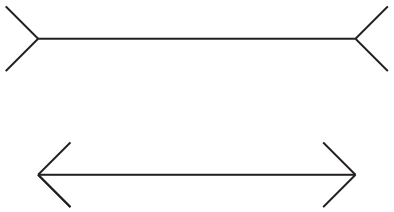
Perhaps this is the greatest challenge in this entire treatise. For governments give billions of dollars and euros of taxpayers' money to astrophysicists and particle physicists for their research projects on the assumption that they will learn something about the Universe and what it is. But this is a false assumption. The arena in which we live our lives is not space-time; it is Consciousness, as we discover when we focus more attention on inner space than outer space, mapping the Cosmic Psyche before we attempt to map what astrophysicists call the Cosmos.

It is not even easy to give a name to the domain that physicists study for the meaning of the word itself has been corrupted over the years, as we see on page 10. Just as Darwin's book *On the Origin of the Species* does not tell us where the species originated, physicists do not know where the origin of the Universe is to be found, from where everything in the world of form is born. So even the term 'natural science' is a misnomer. And while physiology, from Greek *phusiologia* 'natural philosophy', might tell us something about how our bodies function, such studies do not tell us why we humans behave as we do.

To give the 'physical' domain a name, I have chosen to call it the *hylosphere*, from Greek *ὑlē* 'matter', which could also be translated 'wood' or 'forest'. So a hylicist is a materialist, from *hylic* 'pertaining to matter, material', opposed to *psychic* and *pneumatic* in Gnostic theology. And *hylarchic* is an obsolete word meaning 'ruling over matter', which is very much what materialist scientists are attempting to do today.

A central problem here is that physicists believe in the existence of an external world independent of the perceiving subject, as we see in Einstein's comment on page 14. In a similar fashion, Robert H. Dicke and James P. Wittke wrote this in a classic textbook on quantum physics:

> A physicist is concerned with two worlds: a *real* external world, which is believed by physicists to have an objective reality, and an *image* of this world, an internal world, which he hopes is a reasonable model of the external world. The external world manifests itself through *sense* impressions; from birth, and indeed even before, the human brain is bombarded with *data* resulting from the stimulation of the sense organs by this external world (my emphasis).[472]



But sometimes our five physical senses deceive us, as we can see in this simple optical illusion, of which there are many on the Web. For the two horizontal lines are actually the same length, despite appearances. Furthermore, ten people in a million make little or no distinction between the senses; it seems that they can hear red and smell music. As Richard E. Cytowic says in *The Man who Tasted Shapes*, what appear to be separate senses to most of us merge and unify in synaesthetes in a condition called synaesthesia,[473] from the Greek *sun* 'together' and

aisthēsis 'sensation, perception, feeling', cognate with *anaesthetic* 'an agent that causes loss of sensation'. So, as physicists separate our inner and outer worlds, how can scientists study their interface?

Well, to deal with these and many other problems in science, in this chapter I narrate a little how Life has led me to resolve some of these issues, as they pertain to the hylosphere. For the central purpose of this book is to complete the revolution in science that is unfolding today, by using the Hidden Harmony and Principle of Unity to establish that Consciousness is Ultimate Reality, free of the illusions of *māyā*. It has been a very long journey, taking me over sixty-five years to effect the contextual inversion that we all need to make if we are to realize our fullest potential as a species before our inevitable demise.

As I describe on page 10, I have been puzzling about what the Universe is and how it is designed since I was seven years of age. For I could not see any way of reconciling the concept of Universe, as Ultimate Reality, with that of God, as the Supreme Being. So, just what is it? Well, in terms of observation, no one has ever seen the Universe, as we might instantly observe a rose, for instance. Rather, the concept of the Universe is essentially a composite one, conventionally built up by aggregating and projecting the concepts of our objective, day-to-day experience, most commonly focusing attention on what we can access through our five physical senses, leaving our subjective thoughts, feelings, and emotions out of the overall picture.

The way I give meaning to the Universe is to look at the root of the word, which is Latin *ūniversus* 'whole, entire', from *ūnus* 'one', and *versus*, past participle of *vertere* 'to turn'. So in order to view the Universe, as it is, rather than how we are taught to view it, we need to turn all the fragmented, specialized branches of learning into a coherent whole. Not that this is easy within today's education system. For the word *university* is cognate with *Universe* and universities do not turn all specialized disciplines into an entire, transdisciplinary whole. So they hardly live up to their name.

This became crystal clear to me in the summer of 1980, when I set out to develop a cosmology of cosmologies that would unify the psychospiritual and physical energies at work in the Universe within a single, all-encompassing framework. For the books in my local library, in Putney in London, were physically organized according to the decimal library classification system that Melvil Dewey introduced in 1876. This system has some of the characteristics of both generalization and aggregation hierarchies, with no explicit superclass. Rather, at the top level of the hierarchy were ten classes, such as '000 Generalities', '100 Philosophy and related disciplines', and '500 Pure Science'.

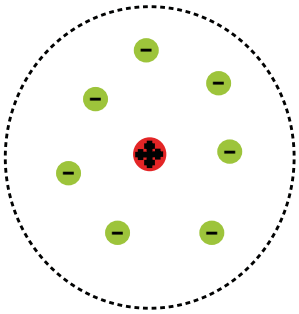
So as books on the scientific and philosophical perspectives of space-time are catalogued '530.11' and '115' ('115.4' before the seventeenth edition), respectively,[474] I had to walk into the library to find books on these subjects. On the other hand, books of knowledge about knowledge, in the category '000 Generalities', were close to the entrance of the library. Indeed, Dewey originally left class '000' unallocated, so it could today be considered as the superclass for all classes in Dewey's system. This is quite clear from the fact that this class was relabelled 'computer science, knowledge, and general works' between the seventeenth and twenty-second editions in 1979 and 2003, which I consulted in Putney and Gothenburg University libraries, respectively. This is a clear sign that computer science contains the abstract, general concepts that provide the seeds for a megasynthesis of all knowledge. So any books on Panosophy, as the Unified Relationships Theory, that might one day be published would fit neatly into the superclass **000**.

So just as the phylum to which *Homo sapiens* belongs is numbered A-37 in Lynn Margulis and Karlene V. Schwartz's model of the Five Kingdoms, one of ninety-six phyla, categories '530.11' and '115' in the

Dewey catalogue are of no special significance. They are just branches on the tree of knowledge, just as we humans are tiny twigs on the tree of life.

Another way to see the insignificance of the basic concepts of the physical universe or hylosphere in the overall scheme of things is to see that mass, space, and time are just concepts, no different from any other. We can see this most clearly from the way mathematicians, computer programmers, and information systems architects treat these concepts in their equations, functions, and semantic models. They treat all these concepts in exactly the same way as any other quantitative value, as we can see in the equations $F = ma$ and $E = mc^2$, Newton and Einstein's fundamental equations, respectively. The former has exactly the same form as *cost* = *price* × *quantity*, which we use when we buy a few kilograms of potatoes in the supermarket.

But before I began to put physicists' discoveries into a Holoramic perspective, I need to mention why I more or less abandoned physics when studying the subject at high school, as a complement to my main interest, which was mathematics. For hanging on the wall of the physics lab was a table of the fundamental particles of matter that had so far been discovered, overturning the philosophy of atomism, which we have inherited from Leucippus and Democritus in ancient Greece. For the word *atom* derives from Greek *atomos* 'indivisible, uncuttable' from *a-* 'not' and *temnein* 'to cut'.



As I was taught in school, Ernest Rutherford had discovered in 1911 that atoms are mostly 'empty' space, not solid at all, consisting of a positively charged nucleus, where most of the mass of the atom is concentrated, surrounded by negatively charged electrons, illustrated here. Experiments had thus shown that the atom is not indivisible, as had previously been believed. But how long could physicists continue to subdivide the atom into smaller and smaller subatomic particles, endeavouring to find an indivisible particle that is the basic building block of all matter in the physical universe?

Such activities did not make sense to me, for as soon as one group of particle physicists claimed to have found such a fundamental particle, another group would set out to prove them wrong. So no one could ever know at what point this process would reach a conclusion. Such a pursuit could not help me to understand what the Universe is, how it is designed, and of its relationship to the Divine, necessary for me to find deep Inner Peace. This is one of the main reasons why I abandoned physics as the primary science as a teenager, studying economics rather than physics as a subsidiary to majoring in mathematics.

Yet, today, physicists have persuaded governments to spend many billions of euros and dollars on this futile pursuit. Indeed, I have read that after particle physicists discovered Higgs boson whizzing around their Large Hadron Collider (LHC) at CERN in Switzerland, they have continued to search for even more subatomic particles. Is this madness ever going to end?

Well, one way of doing so is to see that particle physicists apply the radical egalitarianism[475] of Integral Relational Logic to form concepts and organize their ideas just like everyone else. The universality of IRL is simply illustrated in the following table, a section of the standard model of fundamental particles and interactions. **Fermion** is a class, with two subclasses **Lepton** and **Quark**. Types of leptons and quarks, such as muon and charm, are entities or subclasses, as instances of these classes, having the attribute names of *flavour*, *mass*, and *electric charge*, with their attribute values being the content of the table.[476] There is nothing special about mass, space, and time, or the concepts of God, Universe, humanity, and I, for that matter.

FERMIONS matter constituents spin = 1/2, 3/2, 5/2, …

Leptons spin =1/2

Flavor	Mass GeV/c^2	Electric charge
ν_L lightest neutrino*	$(0–0.13)\times10^{-9}$	0
e electron	0.000511	–1
ν_M middle neutrino*	$(0.009–0.13)\times10^{-9}$	0
μ muon	0.106	–1
ν_H heaviest neutrino*	$(0.04–0.14)\times10^{-9}$	0
τ tau	1.777	–1

Quarks spin =1/2

Flavor	Approx. Mass GeV/c^2	Electric charge
u up	0.002	2/3
d down	0.005	–1/3
c charm	1.3	2/3
s strange	0.1	–1/3
t top	173	2/3
b bottom	4.2	–1/3

The other major reason why I abandoned physics at university was that I did not believe in the big bang theory as the origin of the universe, somewhere backwards in finite time. As a teenager in the 1950s, I favoured Fred Hoyle's steady-state model of the Cosmos purely on the grounds that it was more elegant. Indeed, it is rather strange that what Hoyle disparagingly called a 'big bang' in a famous radio broadcast on the BBC on 29th March 1948, should have become entrenched as scientific dogma.[477]

For in Edwin Hubble's landmark 1929 paper, in which he announced the discovery of twenty-two galaxies beyond the Milky Way, five are converging on themselves while the other seventeen are moving away from each other.[478] For instance, Hubble discovered that the Andromeda galaxy, the nearest to us, is moving towards the Milky Way at 70 kms/sec or 252,000 kms/hour. As Brian Cox tells us, one day soon (in three to five billion years), the Andromeda and Milky Way galaxies will collide.

Nevertheless, despite my scepticism about the way scientific studies were being conducted in the 1950s, I still had faith that one day we humans would discover how the Universe is designed through the resolute power of reason. So at the age of sixteen, recognizing that scientific analysis can never end, I asked myself the question, "What can we know about the Universe that is beyond the frontiers of science at any one time?"

Unifying quantum and relativity theories

In the event, I found the answer to this question in November 1980, when I met David Bohm for the first time at London University, having sent him a rather tentative essay titled 'The Future of Computers and Humanity'. It was a highly improbable meeting, considering that I had effectively abandoned physics at sixteen, that I was still in the embryonic period of development, and that Bohm had been a colleague and friend of Einstein at Princeton in the 1940s and 50s.

I did not discover an explanation for our meeting until 1996, when a woman friend I met at a conference on 'Spirituality in Business' at the Findhorn Foundation in Scotland kindly sent me a copy of James Hillman's *The Soul's Code*. In this book, Hillman well explains how such a meeting could come about with his 'acorn theory' of human development. As Hillman said, we are all given a unique soul before we are born, which he calls an *acorn*, as a generic term for *image*, *character*, *fate*, *calling*, and *destiny*, corresponding to what the Romans called *genius* and the Greeks *daimon*. But such a unique potential often cannot develop without a helping hand. Using George Berkeley's doctrine of *esse est percipi* 'to be is to be perceived', Hillman gave many examples of the way that the direction of people's lives had been

changed because a mentor could see into the depths of a person's soul and intuitively see what that person was destined to become one day.[479]

So it would seem that David Bohm could see something in me that most could not see, most probably because of our shared passion for Wholeness and the healing of our fragmented, split minds. Indeed, as I can now see, the business management and modelling problem that I was struggling to solve in the winter of 1980 was essentially the same problem that physicists face in unifying quantum and relativity theories. Bohm, like me, solved this problem by recognizing that we cannot separate the observer and observed, a notion that led him to Krishnamurti about 1960, as he told Evelyn Blau in an interview.[480] This is how Bohm described this healing process in *Wholeness and the Implicate Order*, published in 1980:

> The fragmentation involved in a self-world view is not only in the content of thought, but in the general activity of the person who is 'doing the thinking', and thus, it is as much in the process of thinking as it is in the content. Indeed, content and process are not two separately existent things, but, rather, they are two aspects or views of one whole movement. Thus fragmentary content and fragmentary process have to come to an end *together*.[481]

And this is what he felt about the state of science in an article he wrote in 1976 on the problem of the fragmented mind:

> Most physicists still speak and think, with an utter conviction of truth, in terms of the traditional atomistic notion that the universe is constituted of elementary particles which are 'basic building blocks' out of which everything is made. In other sciences, such as biology, the strength of this conviction is even greater. … For example, modern molecular biologists generally believe that the whole of life and mind can ultimately be understood in more or less mechanical terms, through some kind of extension of the work that has been done on the structure and function of the DNA molecule. A similar trend has already begun to dominate psychology. Thus we arrive at the very odd result that in the study of life and mind, which are just the fields where formative cause acting in undivided flowing movement is most evident to experience and observation, there is now the strongest belief in the atomistic approach to reality.[482]

When I first met my principal scientific mentor, I was still struggling to find a property that both physical and psychospiritual energies share. For this was key to healing the split between science and religion, which had so troubled me in my youth. Accordingly, I asked Bohm, "What is the origin of all the energy in the Universe?" He replied that energy does not have a source; it is contained within structure.

I now know that the first part of this reply is not true. The Ultimate Source of all energy lies at the centre of the Numinosphere, at the Divine Origin of the Universe. Nevertheless, the second part has enabled me to answer my adolescent question. As the underlying structure of the Universe is an infinitely dimensional network of hierarchical relationships, we know that any knowledge that is beyond the frontiers of knowledge at any one time has essentially the same structure. So we know the underlying structure of this knowledge before it has been discovered.

So IRL is not limited to the ten or twenty-four dimensions of string theory, mentioned by Stephen W. Hawking in *A Brief History of Time*,[483] which have apparently now become 11-dimensional space-time. Indeed, mathematicians can handle an infinite number of spatial dimensions, such as regular polytopes, as generalizations of the five Platonic polyhedra.[484] It is therefore not surprising that string theory has been dismissed "as a theoretical cul-de-sac that has wasted the academic lives of hundreds of the world's cleverest men and women."[485]

Integral Relational Logic extricates science from this dead end by recognizing that dimensions, as domains of values, can be both qualitative and quantitative. For instance, in the relational model of data, attribute values for the colour of blouses could be pink, turquoise, and maroon, and the sex of humans could be female, male, and intersex, as some countries are beginning to recognize.

Regarding the concept of energy, this is such a confused subject that in 1996 the Scientific and Medical Network (SMN) in the UK devoted one of its Mystics and Scientists conferences trying to unravel its

mysteries in a conference titled 'The Nature of Energy: Science and the Subtle'.[486] We can see from the root meanings of *energy* and *synergy*, defined on page 15, that these words originally referred to human activity and work.

More generally, Aristotle, in attempting to find a causal explanation for the phenomena that he observed, made a clear distinction between *energeia* as an actuality and *dunamis* 'ability, power', from which we obtain *dynamics*, as a potentiality. But we do not need to go further into Aristotle's brave attempts to make sense of the world he lived in, using his four causes of material, formal, efficient, and final. For we can greatly simplify his endeavours in an integral science of causality, the subject of Chapter 5 in the *Wholeness* trilogy.

Historically, the Neo-Platonists then gave *energeia* a mystical meaning, as Chris Clarke, professor of applied mathematics in the UK, explained at the SMN conference. As he said, the idea of *energeia* was:

> A sort of potentiality for action as a seed of God, which could then flow into God. And that became actually the dominant use of the word *energy* in the Middle Ages through the writings of Pseudo-Denys. Energy was part of a triple of *ousia*, *dunamis*, and *energeia*: being, power, energy. The being of God, the power which flowed out from God, the *energeia*, which was the return back to God, carrying the acts of God back to the One. And that was the basic concept of energy for five hundred years in late antiquity and the early Middle Ages.[487]

This conception of energy is reasonably close to providing us with an explanation for the accelerating pace of change that we are experiencing today. However, with the birth of materialistic, mechanistic science in the seventeenth century, the concept of energy took a marked turn of direction. "Energy became a numerically conserved quantity," with these dimensions, encapsulated in Einstein's famous equation $E = mc^2$:

$$\frac{mass \times distance \times distance}{time \times time}$$

So physicists have usurped the true meaning of energy, saying that it is measured in joules, in the SI units of *Système International d'Unités*, where *kg* is the kilogram, *m* is the metre, and *s* is the second:

$$J = \frac{kg \cdot m^2}{s^2}$$

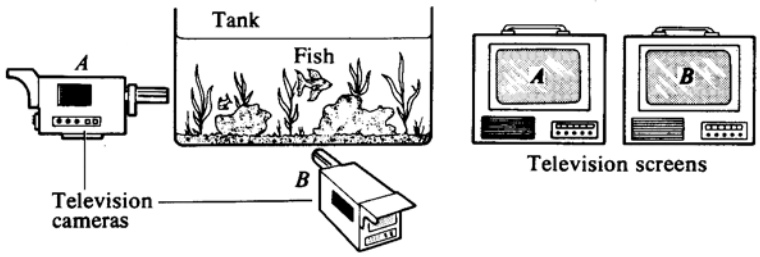
We can restore the original meanings of *energy* and *synergy* by using Bohm's concept of structural energy, where structures consist of meaningful relationships between forms, called *fields* in physics, most simply depicted in mathematical graphs, as illustrated on page 38. This understanding has enabled me to use the semantic modelling methods that underlie the Internet to unify the psychospiritual energies within us with the material energies recognized by physicists. In this simple way, Einstein's unified field theory becomes the Unified Relationships Theory, with the Cosmic Equation lying at its heart. So rather than associating energy with matter, today I associate energy with the meaning of structure-forming relationships. *Energy is meaning; meaning is energy*.

We can use this relationship to unify psychospiritual and material energies. As a corollary of the special theory of relativity, published in Volume 17 of *Annalen der Physik* in Berlin in 1905, Einstein derived the equation $E = mc^2$ in a three-page paper, titled 'Does the Inertia of a Body Depend on Its Energy Content?', published in Volume 18 the same year. In English translation, "If a body emits the energy L in the form of radiation, its mass decreases by L/V^2," where V is the velocity of light in empty space, a universal constant. In other words, "The mass of a body is a measure of its energy content."[488] But where does this energy come from? Well, as material bodies are structures consisting of forms and the relationships between them—called binding energy—the energy can only come from these relationships, through fusion or fission.

The Cosmic Equation also enables us to complete Bohm's unification of the theories of relativity and quantum mechanics, which Bohm said should really be called 'quantum *non*-mechanics'.[489] For these two fundamental physical theories display opposite characteristics, the former having the properties of continuity, causality, and locality, with the latter being characterized by noncontinuity, noncausality, and nonlocality.[490]

Bohm reconciled these incompatibilities by recognizing the existence of a continuous power underlying the surface of the material universe, accessible to our five physical senses, which he likened to a flowing stream, called the holomovement, whose substance is never the same. As he said, "On this stream, one may see an ever-changing pattern of vortices, ripples, waves, splashes, etc., which evidently have no independent existence as such. Rather, they are abstracted from the flowing movement, arising and vanishing in the total process of the flow."[491]

As well as using a river as a metaphor for what underlies the material universe, Bohm used the metaphor of a fish swimming in a tank with two television cameras filming it to show how relativity and quantum theories could be unified. The television screens would then display opposite characteristics of this single, underlying reality, illustrated here.



But what is the fish to make of all this? Well, the Sufi poet Kabir wrote in the fifteenth century, "I laugh when I hear that the fish in the water is thirsty,"[492] using water as a metaphor for Consciousness, as the Numinosphere. But that is not how astrophysicists understand our Environment, or the Arena in which we live, leaving much to be understood. For instance, Martin Rees has said, "In the twenty-first [century], the challenge will be to understand the arena itself, to probe the deepest nature of space and time," going on to say, "A fish may be barely aware of the medium in which it swims."[493] For as Kabir the weaver says in the fish poem, "You do not see that the Real is in your home, and you wander from forest to forest listlessly."

To explain this wonderful sense of Wholeness, Bohm used the hologram as a metaphor for the undivided wholeness of both relativity and quantum theories, illustrating a quite new type of order—the implicate order—underlying the explicate, where we see phenomena as being separate from each other, including each of us as human beings. For *hologram* derives from Greek *ὁlos* 'whole' and *gramma* 'letter of the alphabet', from *graphein* 'to write'.[494] So a hologram or holograph is something that 'writes the whole',

Bohm was not the only one to view his specialist domain of study of holographically. Karl Pribram had also done so in 1971 in his book *Languages of the Brain*.[495] Then in the second half of the 1970s, Pribram noticed that some of the patterns in the brain have similar characteristics to the paradoxes of quantum physics, which was in a 'conceptual muddle', as his son John, who was a physicist, told him. For, as John said, "modern physics is not interested in concepts; the mathematical formulations are so precise and have had so much predictive value that conceptualization is not only not necessary but gets in the way."[496]

Nevertheless, not all physicists think in this way, Pribram learned. David Bohm was one who did not, which led Pribram and Bohm to a fruitful relationship over some ten years. As Bohm put it, "Pribram has given evidence backing up his suggestion that memories are not generally recorded all over the brain, in such a way that information concerning a given object or quality is not stored in a particular cell or localized part of the brain but rather that all information is enfolded over the brain."[497] However, Pribram did have some difficulty with Bohm's view that the Universes is all 'thought' and that reality only exists in what we thought.[498]

Of course, as the entire Universe is holographic, it is not only scientists who have discovered the fundamental nature of Reality. Such a wholesome worldview is ever present to those with the necessary sensitivity. For instance, this is how William Blake beautifully described such a holographic way at looking at the Totality of Existence in *Auguries of Innocence*:

To see a world in a grain of sand,
And a heaven in a wild flower,
Hold infinity in the palm of your hand,
And eternity in an hour.

Yet, even today, few scientists have understood or accepted Bohm's reconciliation of quantum and relativity theories. This is because the theory of the implicate order is as much about healing the fragmented mind as it is about physics, which requires us to go to the quick of the matter, beneath the surface of appearances. The transpersonal psychologist Stanislav Grof well understands this, for he says in *Beyond the Brain*, "Bohm's theory, although primarily conceived to deal with urgent problems in physics, has revolutionary implications for the understanding of not only physical reality but also of the phenomena of life, consciousness, and the function of science and knowledge in general."[499]

In contrast, Martin Rees has said, "Einstein's theory and the quantum theory cannot be meshed together: both are superb within limits, but at the deepest level they are contradictory. Until there has been a synthesis, we certainly will not be able to tackle the overwhelming question of what happened right at the very beginning." As he goes on to say, "Interpretations of quantum theory today may be on a 'primitive level', analogous to the Babylonian knowledge of eclipses: useful predictions, but no deep understanding."[500]

We can find such deep understanding when Bohm's notion of a one-dimensional river of life underlying what we can observe with the physical senses becomes the multidimensional Numinosphere, as the Ocean of Consciousness, which the journalist Lynne McTaggart simply calls *The Field* in a book with this title, subtitled *The Quest for the Secret Force of the Universe*.[501] This book indicates that today a number of other scientists are moving in a similar direction to Bohm in order to explain the paradoxical phenomena that astrophysicists and quantum physicists observe through their telescopes and atom smashers.

Paradoxes of physics

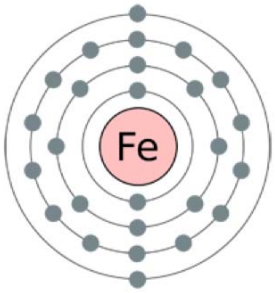
Having abandoned physics in 1960, as it is clearly not based on the Truth, I have no direct experience of what physicists observe through their senses or of the mathematical techniques they use to interpret the data patterns in their observations. Neither have I studied the history of the subject to the same extent as I have studied the history of ideas as a whole, not the least because it is so confused.

Wikipedia lists no fewer that sixteen different interpretations of quantum physics in a table with nine attributes, with most values being 'Yes', 'No', or 'Agnostic'.[502] It is not surprising therefore that Richard

Feynman is attributed with saying, "If you think you understand quantum mechanics, you don't understand quantum mechanics," a variation of a quote attributed to Niels Bohr: "Anyone who is not shocked by quantum theory has not understood it."[503]

The central problem here, of course, is that physicists are trying to interpret their observations within the contextual foundation of the seven pillars of unwisdom, which underlie the whole of Western civilization. But when we view these discoveries with the seven pillars of wisdom, a completely new perspective arises. For phenomena in the hylosphere only make sense when viewed through the noosphere within the Contextual Foundation of the Numinosphere.

In other words, the paradoxes of quantum physics provide us with a mirror of how our minds work, revealing the Hidden Harmony, Principle of Unity, and the Cosmic Equation, showing that opposites can never be separated. The most interesting aspect of quantum physics is therefore to what extent we can use these paradoxes to complete today's revolution in science, transforming either-or thinking into both-and, establishing Consciousness as Ultimate Reality.



To start with the basics, as I understand them, problems arise with interpretations of quantum effects because electrons orbiting atomic nuclei do so in discrete electron shells, illustrated in this diagram of the iron atom. So the energies of electrons are measured in quanta, a *quantum* being 'a discrete quantity of energy proportional in magnitude to the frequency of the radiation it represents', from Latin *quantus* 'how great, how much'. This is quite different from the kinetic energy of a falling body, for instance, or that of a magnetic field, which can be measured continuously. But why be shocked? As the Hidden Harmony governs the Universe, we must expect to observe both continuous and discontinuous phenomena, just as we see them in mathematics.

The essential difference between all the elements is how many shells there are in the atom and how many electrons there are in each shell, called periods in the periodic table of chemical elements, displayed on the next page from Wikipedia, where the legend is to be found.[504] Groups indicate atoms with similar physical or chemical characteristics, as most chemical properties are dominated by the orbital location of the outermost electron shells.

So far, so good; just straightforward logic. The table shows how most atoms have two properties, period and group, which can be displayed in matrix form, an extension of the basic construct of relation in Integral Relational Logic. Interesting that the maximum number of electrons in each shell in an atom—specifically no. 118, synthetic ununoctium—is 2, 8, 18, 32, 32, 18, 8, which reminds me of Pascal's triangle.

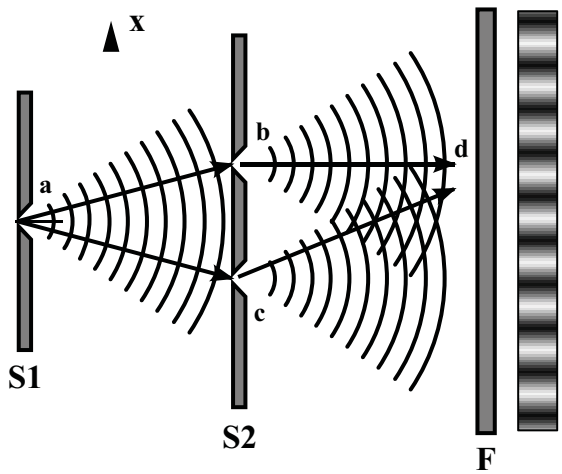
But now things begin to get really intriguing. When an electron moves from one shell to another, it does so in a quantum jump. As Amit Goswami explains in *The Self-Aware Universe*, "the electron makes the jump without ever passing through the space between the rungs [of the energy ladder]. Instead, it seems to disappear at one rung and to reappear at the other."[505] This is mind blowing if we think that we are looking at objective reality. But we are not. The concepts in our minds that we form from such observations in the noosphere, projected into the hylosphere, are inseparable from the vast Ocean of Consciousness, which is the Numinosphere.

This perspective is something that a few physicists are beginning to realize, such as Amit Goswami, 'The Quantum Activist',[506] and Fred Alan Wolf, 'Dr. Quantum',[507] who wrote the forward to *The Self-Aware Universe*. As the latter said, "Goswami's book is an attempt to bridge the age-old gap between science and spirituality. … He explains how he experienced his own theory when he realized the mystical truth, the 'nothing-but-consciousness must be experienced in order to be *understood*'." Perhaps this

Group → / Period ↓	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	1 H																	2 He
2	3 Li	4 Be											5 B	6 C	7 N	8 O	9 F	10 Ne
3	11 Na	12 Mg											13 Al	14 Si	15 P	16 S	17 Cl	18 Ar
4	19 K	20 Ca	21 Sc	22 Ti	23 V	24 Cr	25 Mn	26 Fe	27 Co	28 Ni	29 Cu	30 Zn	31 Ga	32 Ge	33 As	34 Se	35 Br	36 Kr
5	37 Rb	38 Sr	39 Y	40 Zr	41 Nb	42 Mo	43 Tc	44 Ru	45 Rh	46 Pd	47 Ag	48 Cd	49 In	50 Sn	51 Sb	52 Te	53 I	54 Xe
6	55 Cs	56 Ba		72 Hf	73 Ta	74 W	75 Re	76 Os	77 Ir	78 Pt	79 Au	80 Hg	81 Tl	82 Pb	83 Bi	84 Po	85 At	86 Rn
7	87 Fr	88 Ra		104 Rf	105 Db	106 Sg	107 Bh	108 Hs	109 Mt	110 Ds	111 Rg	112 Uub	113 Uut	114 Uuq	115 Uup	116 Uuh	117 Uus	118 Uuo
Lanthanides				57 La	58 Ce	59 Pr	60 Nd	61 Pm	62 Sm	63 Eu	64 Gd	65 Tb	66 Dy	67 Ho	68 Er	69 Tm	70 Yb	71 Lu
Actinides				89 Ac	90 Th	91 Pa	92 U	93 Np	94 Pu	95 Am	96 Cm	97 Bk	98 Cf	99 Es	100 Fm	101 Md	102 No	103 Lr

explains why neither Goswami, who I met at the Holma College of Holistic Studies in 2002, nor Wolf are mentioned on Wikipedia's page as interpreters of quantum physics.

This is one reason why completing today's revolution in science is so incredibly challenging. Without the mystical experience that arises from living consciously and cognitively in union with the Divine, it is not easy to heal the split between mysticism and science. Nevertheless, if we continue to explore the paradoxes of quantum physics a little further, maybe this could help awaken people to the fact that our ultimate destiny as a species is dependent on us all working harmoniously together with a common vision.



The most well known of these paradoxes is the wave-particle duality of light and other forms of electromagnetic radiation. This is demonstrated in the double-slit experiment, first conducted by Thomas Young in 1801. When a stream of electrons pass through a pair of slits in a screen, the wave phases interfere with each other, both reinforcing and cancelling each other to form an interference pattern, displayed here.

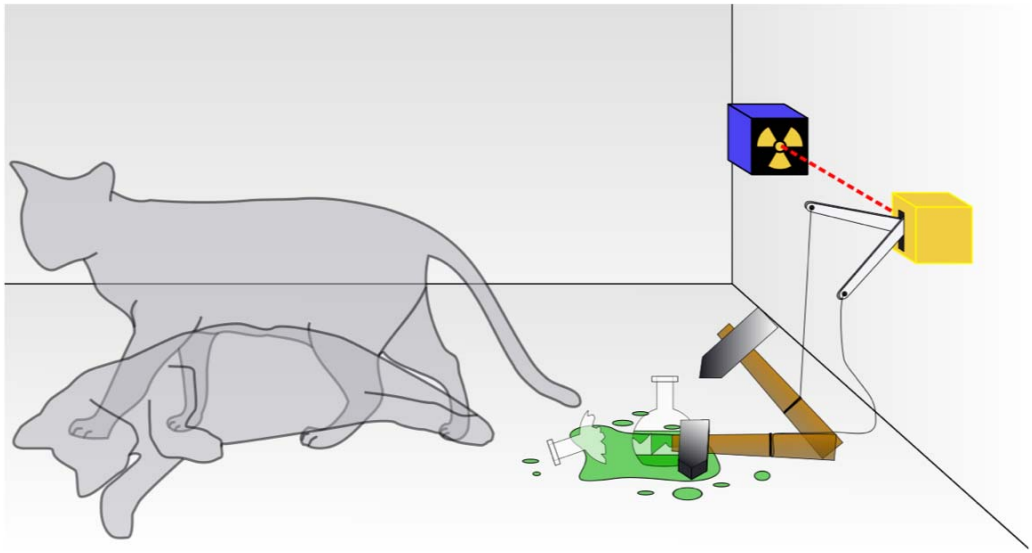
This might seem quite reasonable. But now things get really eerie. When a single electron is shot at the screen, an interference pattern still appears, as if the electron passed through both screens at the same time. In Paul Dirac's words, "Each photon [in the case of light] interferes only with itself." This is not all. In disbelief that an electron passes through both slits, physicists try to observe which slit it actually passes through. But then such an observation effect changes the behaviour of the electron and it appears as a particle on the screen.[508]

Amit Goswami explains that this happens as the result of the uncertainty principle, which Werner Heisenberg introduced in 1927. This states that the more precisely the position of some particle is determined, the less precisely its momentum can be known, and vice versa. So information is lost in the process of measurement, which Heisenberg originally attributed to an observer effect. For instance, "for

an electron to become detectable, a photon must first interact with it, and this interaction will inevitably change the path of that electron." However, it has since been shown that that the uncertainty principle is inherent in the properties of all wave-like systems, and that it arises in quantum physics simply due to the matter-wave nature of all quantum objects.

What this means is that we can never know exactly where electrons in electron shells in atoms are at any one time. Their positions are determined by a probability density function, which has the characteristic bell-shape of the Cosmogonic Cycle illustrated on page 6. Electrons thus form 'electron clouds' as atomic orbitals, as solutions to the linear partial differential equation introduced by Erwin Schrödinger in 1926.

This equation then leads to the concept of quantum superposition, which Schrödinger called *Verschränkung* 'entanglement', in which every quantum state can be represented as a sum of two or more other distinct states. An example is interference peaks from an electron wave in a double-slit experiment. This paradoxical situation is illustrated in popular culture by Schrödinger's cat, a thought experiment in which the cat can apparently be both alive and dead at the same time. This thought experiment is illustrated in this diagram, from Wikipedia.



A cat, a flask of poison, and a radioactive source are placed in a sealed box. If an internal monitor detects radioactivity (i.e., a single atom decaying), the flask is shattered, releasing the poison that kills the cat. The Copenhagen interpretation of quantum mechanics implies that after a while, the cat is simultaneously alive and dead. Yet, when one looks in the box, one sees the cat either alive or dead, not both alive and dead. This poses the question of when exactly quantum superposition ends and reality collapses into one possibility or the other.[509]

What we have here is a classic example of the Principle of Unity—Wholeness is the union of all opposites—also denoted by the Cosmic Equation. Ultimate Reality is Nondual, both A and not-A, sometimes appearing in this way in the world of form, such as in some self-referencing statements, and sometimes falling to one side or other, like the toss of a coin.

This notion of superposition also lies at the heart of quantum computers in which bits of data, known as qubits, can be both 0 and 1 at the same time, which they are being determined randomly. At first sight, this does not look too promising, for usually one wishes computers to produce definite results, although these are not always predictable, not the least because of the existence of random-number-generator functions. However, in 1992, David Deutsch and Richard Jozsa devised a deterministic algorithm—in what we can call qubit algebra—which always produces an answer, and that answer is always correct.[510]

Where quantum computers might lead is uncertain at present, dependent to a great extent on humanity's ability to understand what is happening to our species at the present time. The notion of entanglement could be a great help here. For we humans are all entangled with each other, as superpositioned, androgynous beings. So could the paradoxes of quantum physics help us to discover what it truly means to be a human being?

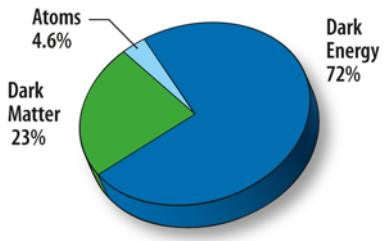
Consciousness as Ultimate Reality

For such an awakening of intelligence and consciousness to happen globally, we need to recognize that Consciousness is causal, as Amit Goswami and Fred Alan Wolf, for instance, teach. Consciousness lies at the foundation of the Universe; it is the ground of all being. Others moving in a similar direction are John Hagelin, Peter Russell, Stanislav Grof, and Deepak Chopra.

The systems philosopher Ervin Laszlo calls this great revolution in science the 'Akashic paradigm', using the word *Akasha* to refer to the Universal Quantum Field. He took the word from Vivekananda's *Raja Yoga*: "Everything that has form, everything that is the result of combination, is evolved out of this *Akasha*. … Just as *Akasha* is the infinite, omnipresent material of this universe, so is this *Prana* the infinite, omnipresent manifesting power of this universe."[511]

The word *Akasha* derives from Sanskrit *Ākāsha*, corresponding to Greek *aither* 'pure, fresh air', in Latin *æther*, "the pure essence where the gods lived and which they breathed", which is *quintessence*, the fifth element, the others being fire, air, earth, and water, of course. But what is this quintessential æther and how can we know of its existence, never mind that it is Ultimate Reality? Well, in 1887, Albert Michelson and Edward Morley showed in a famous experiment that an 'æther wind' could not be physically detected as the Earth passed through the supposed æther.[512] Although Albert Einstein did not specifically mention the Michelson–Morley experiment in his 1905 paper on the special theory of relativity,[513] he did say that the notion of 'aether-drift'[514] is 'superfluous' in his theory.[515]

However, the notion of the Æther or Akasha is no longer superfluous in physics. Indeed, once physicists feel the irrepressible Power of Life within them, they will be able to explain dark matter and dark energy, which so mystifies them today. The key point is that the four physical forces recognized by physicists cannot fully explain how galaxies are formed or why paradoxically the physical universe is expanding so fast. So they have surmised the existence of dark matter, as an attractive force, and dark energy as an expansive one, as this NASA diagram illustrates.[516] The fact that Consciousness acts in both a convergent and divergent manner in this context is, of course, an example of the Principle of Unity at work.



Recognizing that Consciousness is all there is also helps us solve another problem that puzzles physicists today. In the movie *The Theory of Everything*, one scene shows Stephen Hawking being awarded a Ph. D. for his theory that what physicists call a big bang emerged from a black hole, inspired by Roger Penrose's theory of black holes. For as Kim Weaver of NASA has said, "In some ways, the physics [of black holes] is very similar to what started the universe."[517] And just as general relativity indicates that there could be many black holes, not observable directly, Martin Rees has said, "There could have been many big bangs, even an infinity of them. … Whenever a black hole forms, processes deep inside it could perhaps trigger the creation of another universe." Rees, among others, has thus been

led to hypothesize a multiverse of parallel universes, of which our own is "just one 'island' in an infinite archipelago".[518]

William James coined the term *multiverse* in an address that he gave to the Harvard Young Men's Christian Association in 1895, titled 'Is Life Worth Living'. Seeking to show that life is only worth living if we recognize that nature, as presented to us by materialistic science, "cannot possibly be its *ultimate word* to man", he said, "Visible nature is all plasticity and indifference,—a moral multiverse, as one might call it, and not a moral universe. To such a harlot we owe no allegiance.[519]

Recognizing that our minds create our reality, I visualize the hylosphere today as a multiverse of physical universes existing both in parallel and consecutively, constantly rising and falling like waves on the Ocean of Consciousness, in conformity with the Cosmic Equation. The Principle of Unity thus enables me to reconcile the big-bang and steady-state cosmologies, which puzzled me as a teenager in the 1950s. While the hylosphere exists through infinite time as eternity, it actually comes into existence through the Divine power of Life constantly creating forms and structures in the Eternal Now. Without admitting Life into science, we can understand neither physical nor biological processes.

This coherent picture of the constant birth and death of physical universes is not just speculative philosophy. It corresponds directly with my life experiences. For instance, when my Norwegian wife and I followed the spiritual teachings of Barry Long in the late 1980s and early 90s, he would inspire us to feel the blackness at the centre of our beings, encouraging us to fall into this black hole, free of the sense of a separate self. Paradoxically, this black hole is the Source of the radiant Light of Consciousness, as the diagram on page 28 illustrates.

Psychologically, I felt myself in a black hole at university in the early 1960s, when I realized that what I had been taught in religion, science, economics, and mathematics made little sense as a coherent whole. I recovered a little to get married and learn my trade in the information technology industry. But in the late 1970s, I fell into a psychological black hole once again when I realized that my children were not being taught to live in the world that would exist when they came to have children of their own. As mentioned on page 15, I escaped from this black whole at 11:30 on 27th April 1980, when a big bang erupted in my consciousness, enabling me to build a brand new universe, as I am describing in this book.

The cosmological principle

Even though physicists' view of the cosmos is just one per cent of the entire Cosmos, we can learn something about the future of humanity from the various cosmologies that physicists have been developing since the end of the Second World War. The word *cosmos* derives from Greek *kosmos* 'order, ornament, world or universe (so called by Pythagoras or his disciples 'from its perfect order and arrangement' '. Accordingly, the OED gives this narrow definition of *cosmos*: 'the world or universe as an ordered and harmonious system', *universe* being 'all matter, space, and time considered as a whole'. Then, in the 1800s, *cosmos* became generalized to mean 'an ordered and harmonious system (of ideas, existences, etc.), e.g. that which constitutes the sum-total of 'experience' '.

So how have cosmologists set out to bring order to their understanding of the hylospherical cosmos? Well, in *Cosmology*, published in 1952 and 1960, Hermann Bondi stated the 'cosmological principle' that underlies all various theories of cosmology thus: "the universe presents the same aspect from every point except for local irregularities. Although there are wide divergences of view as to the significance, the necessity, and the logical position of this postulate, the agreement as to its validity is very remarkable, and its utility is beyond doubt."[520]

I regard this cosmological principle as a generalization of the principle of relativity, which states that physical phenomena run their course relative to different coordinate systems according to the same general laws. However, the principle of relativity is incompatible with the observed constancy of the speed of light, which led Einstein to develop the special theory of relativity in 1905.[521] Even two events A and B are not necessarily simultaneous. Other observers could see A occurring before B and vice versa, an idea that intrigued me as an adolescent.

The cosmological principle also applies to OED's broader definition of *cosmos*, as we see in the Internet, as an ordered system of ideas. For no matter where we look in the Internet, we see the same underlying patterns, a universal principle that underlies Panosophy or the United Relationships Theory, as the Theory of Everything.

Bondi, himself, used the cosmological principle to favour the steady-state model of the physical cosmos, for, in his opinion, "the steady-state theory agrees best with observation and has the simplest and most logical basis."[522] One implication of this fundamental principle is that human beings do not occupy a special position in the cosmos, an idea that Bondi called the 'Copernican principle' because "the Earth is not in a central, specially favoured position". As he said, "this principle has become accepted by all men of science,"[523] for Copernicus began the overthrow of the geocentric worldview favoured by Aristotelians and Christians in the Middle Ages, depicted on page 1.

However, this elegant state of affairs was not to last. Following the discovery of three-degree background radiation, the steady-state cosmological model favoured by Hermann Bondi, Thomas Gold, and Fred Hoyle was rejected in favour of the big bang theory.[524] But where did this leave the cosmological and Copernican principles? Were they to be rejected too?

Well, at a conference in Cracow in 1973, celebrating the 500th anniversary of Copernicus' birth, Brandon Carter said, "although our situation is not necessarily *central* it is necessarily privileged to some extent."[525] He accordingly proposed the anthropic principle with two forms, weak and strong:

> **Weak Anthropic Principle (WAP)**: "We must be prepared to take account of the fact that our location [in time and space] in the universe is necessarily privileged to the extent of being compatible with our existence as observers."[526]
> **Strong Anthropic Principle (SAP)**: "The universe (and hence the fundamental parameters on which it depends) must be such as to admit the creation of observers within it at some stage. To paraphrase Descartes, *cogito ergo mundus talis est* ['I think, therefore the world is such (as it is)']."[527]

One reason he said this is that if some fundamental physical constants were only slightly different, the universe we believe we live in would not have evolved to produce intelligent life, such as ourselves; we humans would not exist. Martin Rees has identified six of these numbers as being especially significant, writing, "Two of them relate to the basic forces; two fix the size and overall 'texture' of our universe and determine whether it will continue for ever; and two more fix the properties of space itself." The numbers need to be 'fine tuned' for intelligent beings to discover how the Cosmos, and hence the cosmos, is designed.

However, the significance of these numbers is based on another assumption that needs to be questioned if we are to understand humanity's place in the overall scheme of things and hence our ultimate destiny as a species. Martin Rees well described these assumptions in the opening paragraphs of the first chapter of his book *Just Six Numbers*:

> Mathematical laws underpin the fabric of our universe—not just atoms, but galaxies, stars and people. The properties of atoms—their sizes and masses, how many different kinds there are, and the forces linking them together—determine the chemistry of our everyday world. The very existence of atoms depends on forces and particles deep inside them. The objects that astronomers study—planets, stars and galaxies—are controlled by the force of gravity. And everything takes place in the arena of an expanding universe, whose properties were imprinted into it at the time of the initial Big Bang.

> Science advances by discerning patterns and regularities in nature, so that more and more phenomena can be subsumed into general categories and laws. Theorists aim to encapsulate the essence of the physical laws in a unified set of equations, and a few numbers. There is still some way to go, but progress is remarkable.

Yes, indeed. It is the purpose of science to discern patterns and regularities in nature, but this does not mean that they can all be expressed in terms of quantitative mathematics. Software developers and information systems architects in business work with both quantitative and qualitative domains of values with equal facility, illustrated with examples on page 107.

Despite this, mathematics is still generally regarded as the language of science, with very few dissenting voices. One such voice was that of David Bohm, who thought when he entered the California Institute of Technology in 1939 that physics needed a deeper philosophical ground than the mathematical techniques that were being used to study the nature of reality. Regarding himself more as a natural philosopher, like Newton, Bohm said, "The general practice of physics has indeed become remote from these deeper considerations."[528]

One person who has been looking deeply into the implications of the anthropic principle is Swedish-born Nick Boström, Director of the Future of Humanity Institute at Oxford University, funded by James Martin. Bostrom, to use the Anglicized form of his name, has set up a portal on the Web on the anthropic principle, writing a downloadable book on the subject titled *Anthropic Bias*.[529]

It is a pretty confused picture, for Bostrom has identified some thirty different versions of what he calls 'anthropic hodgepodge',[530] as people struggle to understand humanity's relationship to the Cosmos, which they regard as the physical universe. At one level, all versions of the anthropic principle seem to be mere tautologies, as John Leslie points out, of little use in scientific method. Nevertheless, as Nick says, "Some philosophers and physicists take fine-tuning to be an explanandum that cries out for an explanans," words that are synonymous with Popper's *explicandum* and *explicans*, mentioned on page 45. He tells us, "Two possible explanations are usually envisioned: the design hypothesis and the ensemble hypothesis. Although these explanations are compatible, they tend to be viewed as competing. If we knew that one of them were correct, there would be less reason to accept the other."[531]

Bostrom seems to have learned of these two explanations from the first chapter in John Leslie's *Universes* titled 'World Ensemble, or Design'. Leslie summarized the central issue with the words "God or Multiverse", citing Henry Adams' *The Education of Henry Adams*, written in the third person in 1905. This book was originally subtitled *A Study of Twentieth-Century Multiplicity*, a follow-on to *Mont-Saint-Michel and Chartres: A Study of Thirteenth-Century Unity*, when Adams began to write these books in 1902, distributed privately in 1904 and 1906, respectively.[532]

When *The Education* was posthumously published in 1918, Henry Cabot Lodge, a US senator who was married to Peirce's first cousin, wrote the foreword. In this, Cabot Lodge said that Adams, as a historian, saw his life working back from unity to multiplicity, reversing Augustine's *Confessions*, which had worked from multiplicity to unity. In Adams' words, positioning himself at the time of Thomas Aquinas and the dawn of the twentieth century, "The movement from unity into multiplicity, between 1200 and 1900, was unbroken in sequence, and rapid in acceleration,"[533] reflecting evolution's divergent characteristics more than its convergent ones. Nevertheless, Adams' book, which won the Pulitzer Prize for Biography or Autobiography in 1919, is as relevant to today's education system as it was in Adams' day. Children born since the beginning of this century are not being educated to meet the immense challenges they will face in their lifetimes.

In Adams' case, even though he was in the privileged position of being the grandson and great grandson of two American presidents, he did not feel that his education in the middle of the nineteenth century had prepared him to live in the twentieth, such was the rapidity of change, accelerating even faster today. Even in 1900, the education system was not much improved, writing "Nothing in education is so astonishing as the amount of ignorance it accumulates in the form of inert facts."[534] Rather, he wrote, in a similar spirit to Alfred North Whitehead and J. Krishnamurti,

> The object of education for that mind should be the teaching itself how to react with vigour and economy. No doubt the world at large will always lag so far behind the active mind as to make a soft cushion of inertia to drop upon, as it did for Henry Adams; but education should try to lessen the obstacles, diminish the friction, invigorate the energy, and should train minds to react, not at haphazard, but by choice, on the lines of force that attract their world.[535]

Faced with this situation, Adams was an autodidact, educating himself to live in a rapidly changing world, much as I have been doing for most of my life. Writing of his boyhood days, being brought up in a highly charged political atmosphere in Massachusetts, Adams said, "Politics, as a practice, whatever its professions, had always been the systematic organization of hatreds." However, Adams did not see any prospect of turning multiplicity into unity, even seeing some explanatory benefits in the former: "He could not deny that the law of the new multiverse explained much that had been most obscure, especially the persistently fiendish treatment of man by man." In the spirit of accepting 'what is', Adams went on to say, "If this view was correct, the mind could gain nothing by flight or by fight; it must merge in its supersensual multiverse, or succumb to it."[536]

Regarding the argument by design, it is pertinent to note that the title of Leslie's book is in the plural. For there is not one universe, which we can all observe, like a rose, in its entirety. Rather, the universe is a construct of the mind, a creative, design exercise we have all been engaged in through the ages, from prehistorical creation myths, through Aristotle's crystalline spheres on the first page, to the Four Spheres, explicated in this treatise. In my experience, there is no universe 'out there' to be designed by God 'out there' for I, like everyone else, am never separate from the Divine for an instant. It is in this way that we can unify the apparently competing design and ensemble hypotheses.

Of these, Bostrom writes, "The design hypothesis states that our universe is the result of purposeful design. The 'agent' doing the designing need not be a theistic God, although that is of course one archetypal version of the design hypothesis."[537] He draws particular attention to Leslie's view of God as a Neoplatonist Creative Force, rather than the Judaeo-Christian conception of a personal God.[538] This fits in very well with my experience of Life bubbling up irresistibly from our Divine Source, through the Numinosphere and noosphere. So I'm not at all concerned about the fine-tuning of physical constants, for these constants in no way influence the design of the Universe that I have been working on for the past thirty-five years in order to unify mysticism and science, psychospiritually explaining why we all, including scientists and technologists, behave in the way that we do.

However, 'fine-tuning' does still concern scientists and philosophers who are cognitively and experientially out of touch with Reality. As Bostrom puts it,

> The main rival explanation of fine-tuning is the ensemble hypothesis, which states that the universe we observe is only a small part of the totality of physical existence. This totality itself need not be fine-tuned. If it is sufficiently big and variegated, so that it was likely to contain as a proper part the sort of fine-tuned universe we observe, then an observation selection effect can be invoked to explain why we see a fine-tuned universe.[539]

He goes on to say, "If the world consists of a sufficiently huge number of such universes, and the values of physical constants vary among these universes according to some suitably broad probability distribution, then it may well be the case that it was quite probable that a fine-tuned universe like ours would come into existence."[540]

But inventing a hylospherical multiverse of physical universes merely to explain the existence of fine-tuned physical constants seems highly speculative to me, not based on experience, observation, or sound theory. What makes more sense to me is what Bostrom calls a 'Wheeler-type multiverse', developed by John Archibald Wheeler, in which "there is a never-ending sequence of universes each of which begins with a big bang and ends with a big crunch which bounces back in a new big bang, and so forth."

Yet, as Nick admits in the final paragraph of *Anthropic Bias* after two hundred pages of philosophical reasoning on these critical issues, "Yet some issues remain mysterious. … [They] may each enclose deep enigmas. These mysteries may even somehow be connected. I hope that others will see more clearly than I have and will be able to advance further into this fascinating land of thought."

We look further at the mystical and mathematical dimensions of what the astrophysicist Richard Gott III aptly calls the 'Copernican anthropic principle'[541] when considering the probabilities of various scenarios for humanity's ultimate destiny. In the meantime, we can look briefly at one other question that fascinates astrophysicists studying the hylosphere: "Are we alone?"

Are we alone?

Martin Rees asked this question in a series of three scientific documentaries broadcast in the UK in 2004 titled *What We Still Don't Know*, other questions being "Was there a beginning?", "What's the future of the cosmos?", and "What is the nature of reality?"[542] John Maddox, formerly editor of the preeminent science magazine *Nature*, addresses a similar theme in *What Remains to Be Discovered: Mapping the Secrets of the Universe, the Origins of Life, and the Future of the Human Race*.[543] Rees, quoting Maddox, explains why conventional scientists have not yet discovered the innermost secrets of the Universe with these words: "The big surprises will be the answers to questions that we are not yet smart enough to ask."[544]

By far the most important question that scientists have not yet asked is "What is causing scientists and technologists, aided and abetted by computer systems, to drive the pace of evolutionary change at exponential rates of acceleration?" The reason why this question is not on the agenda of any university, research institute, technological research and development division, or governmental agency anywhere in the world, as far as I can tell, is that it cannot be answered within the framework of materialistic, mechanistic science. It can only be answered through self-inquiry, free of the false assumptions that we have introjected from the cultures we live in.

Yet, rather than helping to awaken human intelligence, which is needed to solve humanity's problems, most scientists seem to be preoccupied with creating artificial general intelligence in computers and searching for extraterrestrial intelligence in outer space, so far with no success.

For we live in what Paul Davies calls 'an eerie silence', a situation known as the Fermi paradox. In 1950, when Enrico Fermi was working at Los Alamos in New Mexico, he suddenly asked, "Where is everybody?" If the universe is teeming with life, then Earth should have been colonized in the far past.[545] Or at least putative alien beings would have attempted to contact us. Davies wrote his book because he is the chair of the Post-Detection Taskgroup of the Search for Extraterrestrial Intelligence (SETI). "The purpose of the taskgroup is to prepare, reflect on, manage, advise, and consult in preparation for and upon the discovery of a putative signal of extraterrestrial intelligent (ETI) origin."[546]

Amazingly, I discovered as I was writing this dissertation on 20th July 2015 that this taskgroup has been expanded into a Breakthrough Listen project, funded with $100m from Yuri Milner, a Russian venture capitalist investing in information technology businesses. This project was launched at the Royal Society in London with Stephen Hawking and Martin Rees acting as advisors.

Speaking at the launch, Hawking said: "Somewhere in the cosmos, perhaps, intelligent life may be watching these lights of ours, aware of what they mean. Or do our lights wander a lifeless cosmos—unseen beacons, announcing that here, on one rock, the Universe discovered its existence. Either way, there is no bigger question. It's time to commit to finding the answer—to search for life beyond Earth. We are alive. We are intelligent. We must know."

Hawking thought that the Breakthrough Listen project, unprecedented in its scope, was "sure to bear fruit". "If a search of this scale and sophistication finds no evidence of intelligence out there it will be a very interesting result. It will not prove that we are alone, but will narrow the possibilities." "It is important for us to know if we are alone in the dark." Rees added, "The search for extra-terrestrial life is the most exciting quest in 21st-century science. The Breakthrough Initiatives aim to put it on the same level as the other ultimate scientific questions."

Hawking explained why he thought that this project is of fundamental importance for the future of humanity with these words: "To understand the Universe, you must know about atoms—about the forces that bind them, the contours of space and time, the birth and death of stars, the dance of galaxies, the secrets of black holes. But that is not enough. These ideas cannot explain everything. They can explain the light of stars, but not the lights that shine from planet Earth. To understand these lights, you must know about life. About minds."[547]

Yes, indeed. But we can only understand life and mind through introspection, by mapping the 99% of the Universe that is inaccessible to our physical senses in inner space. This is one reason why the Breakthrough Listen project is bound to fail. Any intelligent beings living on another planet elsewhere in the material multiverse would have discovered the innermost secrets of the Universe in their neck of the woods and would have realized that they are never alone. For there is no other in Wholeness. No individual is ever separate from any other being, including the Supreme Being, for an instant. So when we look inwards, all we see and feel is Stillness and the Hidden Harmony. Nothing else really matters.

Therein lies the greatest challenge facing humanity today. The vast scientific enterprise that has given us many creature comforts since the first scientific revolution has reached an evolutionary dead end. If humanity is to consciously and intelligently realize its ultimate destiny before our biological species becomes extinct, evolution has no choice but to take us all in a radically new direction, which we now need to explore.

7. The Singularity in Time

In *A New Earth: Awakening to Your Life's Purpose*, Eckhart Tolle wrote, "We are a species that has lost its way," concluding this inspirational book with these words: "A new species is arising on the planet. It is arising now, and you are it!"[548] But despite this book selling several million copies after Oprah Winfrey promoted it on her talk show in 2008, how many people are yet aware that they, themselves, are pioneering a radically new species?

You would think that such a momentous happening would make headline news in our newspapers and on our television screens, often accessed through computers, tablets, and smart phones today. However, this is not happening, for these pioneering individuals in the second and third tiers of the spectrum of consciousness are mostly invisible to those in the first tier, imprisoned in their cultural conditioning. This is tragic, for humanity cannot survive for very much longer in such fear and ignorance. As Eckhart said in *Stillness Speaks*, an inspiring book of aphorisms:

> The transformation of human consciousness is no longer a luxury, so to speak, available only to a few isolated individuals, but a necessity if humanity is not to destroy itself. At the present time, the dysfunction of the old consciousness and the arising of the new are both accelerating. Paradoxically, things are getting worse and better at the same time, although the worse is more apparent because it makes so much 'noise'.[549]

What is making the most noise today is the prediction that computer scientists are about to create robots with artificial intelligence that will exceed any level of intelligence we humans might aspire to. So the dysfunctional old consciousness is saying that the new species emerging today is a superintelligent mechanical one, not a human species living in union with the Divine, recognizing Consciousness as Ultimate Reality.

One reason why our dysfunctional, deluded society is far more obvious than what some call the emerging Wisdom Society is that the new species has not yet learnt to view humanity and the world we live in through the mystical, life-giving eyes of the Numinosphere rather than the materialistic, mechanistic eyes of the hylosphere. For old habits die hard, as it is often said.

But not necessarily. Through the ages, people have sometimes passed through a sudden transformation of consciousness, as they have experienced the Cosmos in a quite new way, learning to make radical changes to their lives. Something like this needs to happen in the collective by 2020 if the human race is to reach its fullest potential as an alliance of superintelligent, superconscious beings before the inevitable extinction of *Homo sapiens*. In the wise words of Osho, "Be realistic: plan for a miracle."[550]

It is not only mystics who have recognized that all structures in the relativistic world of form are destined to die. During the past few decades, scientists and philosophers have identified many threats to our very existence as a species. But they are doing so with an old mindset, believing that humanity is in control of its destiny. We are not. We are subject to exactly the same laws of the Universe as all other beings, as Shakyamuni Buddha pointed out with his principle of *Trilakshana*.

Boiling down a highly complex psychodynamic picture to its bare essentials, what I see and feel is that evolution is currently pushing us towards Wholeness while involution is pulling us towards Oneness. But while such phylogenetic prospects are greatly attractive, we are running scared, trapped in existential fear, which is holding us back from realizing our fullest potential.

Some assuage such fears by viewing the world through rose-tinted glasses, chanting the New Age mantra, "You cannot afford to have a negative thought." However, such attitudes deny the irrefutable, universal truth of the Principle of Unity. To be Realistic, we need to transcend the opposites of optimism and pessimism in Love, Peace, and Nonduality. For, as the peace-worker James O'Dea has asked, "Can you hold *both* the meaning of the nightmare *and* the signs of our collective awakening—because the only way to get a grip on reality is to see that it is indivisible, reflected in *both* the shadow *and* the light, the bitter *and* the sweet."[551]

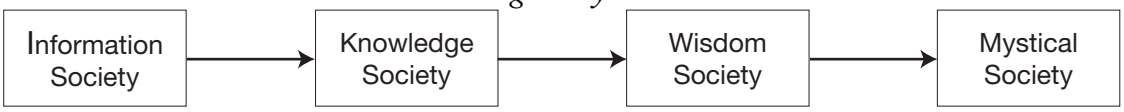
As mystics of all ages have discovered and taught, the only genuine way to be free of existential fear is to let go of attachment to all forms, structures, and relationships, for these are just abstractions from or appearances in Consciousness—illusions. We can see what this means from the Latin word *idem* 'same', which is the root of *identity* in English. The OED gives this primary definition for *identity*: "The quality or condition of being the same in substance, composition, nature, properties, or in particular qualities under consideration; absolute or essential sameness; oneness," indicating something that we all share in common: Wholeness.

However, the dictionary gives this secondary definition: "The sameness of a person or thing at all times or in all circumstances; the condition or fact that a person or thing is itself and not something else; individuality, personality." So *identity* has come to mean that which is unchanging in us as individuals, that which distinguishes us from other human beings, the plants and other animals, and the rest of the Universe. The primary emphasis is on differences rather than on Sameness—that which we all share—leading to much conflict and suffering, not the least from Holy wars—wars about the Whole, including the long-running war between science and religion. It is this sense of identity that can be stolen, in what is absurdly called 'identity theft' today.

Therein lies the greatest challenge facing humanity today. We are all at once the entire Ocean of Consciousness and individual currents and waves beneath and on its surface. Such a realization marks the end of the spiritual journey—steps sixteen and seventeen in Joseph Campbell's monomyth, outlined on page 23. We can see what this means from the evolution of Buddhism, outlined on page 26.

This means that the next Buddha—as Maitreya, the 'Loving one'—can only be a community or global sangha, practising mindful living rather than an individual, as Thich Nhat Hanh has foreseen.[552] For Sanskrit *maitreya* means 'friendly, benevolent', from the same PIE base as *community*, from Latin *commūnis* 'shared, common, public', originally in sense 'sharing burdens', from *cum* 'together with' and *mūnus* 'office, duty; gift, present', from *mūnare* 'to give, present'. *Community* is also cognate with Pāli *mettā* 'loving-kindness', the translation of Sanskrit *maitrī*, akin to Buddhist compassion (*karunā*) and love or charity *ē*) in Christianity. And when our lives are based on Love, the Divine Essence we all share, we realize that kindness is our True Nature, for *kind* is the native English word for *nature*, the OED tells us, having the same root.

With such self-understanding, grounded in the blissful experience of the Divine, we could collectively transform today's Information, Knowledge, and Wisdom Society into the eschatological Mystical Society—the Age of Light—as this diagram illustrates:



Teilhard's evolutionary model

This phylogenetic prospect is entirely in keeping with Teilhard's vision, interpreting the 'superarrangement' that all thinking elements find themselves in today as a "gigantic psychobiological operation—as a kind of megasynthesis".[553] He saw this megasynthesis as the glorious culmination of some fourteen billion years of evolution since the most recent big bang, being driven irrepressively forward by his law of complexity-consciousness: the greater the complexity, the greater the consciousness. For when we view the Cosmos as an ordered, fully integrated information system, we can see that structure-forming relationships are the synergistic motive power behind all evolutionary processes.

By generalizing the semantic modelling methods that underlie the Internet, we are thus able to develop Teilhard's holistic theory of evolution by defining evolution, in all its forms, in this way: *Evolution is an accumulative process of divergence and convergence, proceeding in an accelerating, exponential fashion by synergistically creating wholes that are greater than the sum of the immediately preceding wholes through the new forms and relationships that emerge, apparently out of nothing.*

Regarding his model, itself, by viewing all evolutionary processes as a coherent whole as both a Christian mystic and natural scientist, he saw them progressing from cosmogenesis, through biogenesis and noogenesis, to Christogenesis. He called evolution's four stages Prelife, Life, Thought, and Superlife in the four parts of *The Human Phenomenon*, denoting the physical, biological, noological or mental, and spiritual realms in which evolution takes place. By thus standing at the Alpha/Omega point of evolution, we are able to see the four spheres that enable us to unify mysticism and science, as outlined in this book.

Now, while Teilhard did not explicitly describe the duration of each of the stages and the transitions between them, we can see that each is much shorter than the previous one because accumulative evolutionary change accelerates exponentially, becoming ever faster and faster. Viewed from a temporal perspective, evolution builds on structures that have already emerged in the relativistic world of form, sometimes back-tracking when it reaches an evolutionary dead end. Powered by Life, structures are causal, begetting structures of ever-increasing complexity. This table outlines these four evolutionary stages and the transition stages between them, using science's best estimates of their beginning, end, and hence duration.

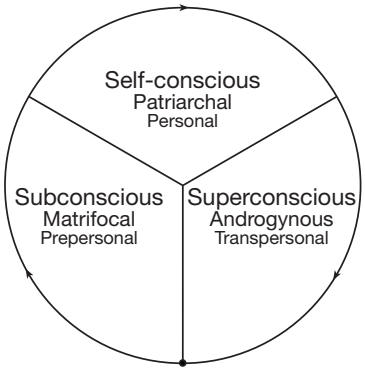
Evolutionary stages, years ago						Transition stages, years ago		
Teilhard	Type	Realm	Start	End	Duration	Start	End	Duration
Prelife	Physical	Hylosphere	14,000,000,000	4,500,000,000	9,500,000,000	4,500,000,000	3,500,000,000	1,000,000,000
Life	Biological	Biosphere	3,500,000,000	25,000	3,500,000,000	25,000	5,000	20,000
Thought	Mental	Noosphere	5,000	50	5,000	50	-50	100
Superlife	Spiritual	Numinosphere	-50	-300	250			

We can see from this holistic perspective that we can only truly understand evolutionary processes by studying the way we learn in the noosphere, rather than by studying the wondrous diversity of species, as biologists have been doing since 1859, when Charles Darwin's book *Origin of Species* was first published. And we can only understand what the Universe is and its Grand Design from the perspective of the unbounded Numinosphere rather than standing in the tiny hylosphere, as physicists are wont to do.

Gathering as much evidence as I can from the insights of people in the world around me, I can see that we have just passed the middle of a 100-year transition period between what we can call the mental-egoic age (the self-centred me-epoch, focused on conflict and competition) and the age of universal spirituality (the socially centred us-epoch, focused on peace and cooperation). We can say that this radical transformation of consciousness began with the counter-cultural movements of the 1960s, symbolized by 'flower power'. It will thus be my grandchildren's generation and their children who will face the immense challenge of carrying humanity out of today's Dark Ages into the eschatological Age of Light.

But even if the next couple of generations manage to wake up to what is happening to us all at the present time, this does not mean *Homo sapiens* is meant to live for ever or for millions or thousands of years. When evolution reaches its fullest glorious culmination in the noospherical collective, there will be nothing more for us to discover. We shall have completed God's purpose here on Earth and we shall be able to die consciously in Peace and Tranquillity, satisfied with a job well done.

To fully understand what this means for the future of humanity, we can adapt Ken Wilber's three phases of human phylogeny in *Up from Eden*,[554] as in this diagram, corresponding to the transition stage between the biosphere and noosphere and the final two stages in Teilhard's evolutionary model. This diagram illustrates Joseph Campbell's Cosmogonic Cycle at the phylogenetic level. Like all other structures in the Universe, *Homo sapiens* emerged from the Formless Ground of Being and is destined to return there at the end of its lifespan, ontogenetically illustrated in the two bell curves in the diagram on page 22. And the point at the bottom of this diagram is the union of points at the top and the bottom of the vertical line in the diagram on page 7, depicting the Eternal Now in the two dimensions of time.



Formless Alpha/Omega Point of Evolution

However, we should not conflate the prepersonal and transpersonal just because they are both different from the patriarchal epoch that is now rapidly coming to an end. We are not returning to a Golden Age, which the myths of many cultures say existed before noogenesis became the dominant thrust of evolution on Earth. To believe this is to fall for what Ken Wilber called 'The Pre/Trans Fallacy' in an essay with that name, published in 1980 in *ReVision*, a journal he had co-founded two years earlier with Jack Crittenden, apparently to publicize his writings. This essay was republished in *Eye to Eye* three years later,[555] where I first read it in the mid 1980s, doing my very best to understand what he was saying when still in the childhood phase of my own awakening ontogeny.

Rather, we are moving forward to something quite different from the comparatively peaceful epoch that preceded the full emergence of the fearful, analytical mind. What I understand today is that we are rediscovering the ancient wisdom of the Great Goddess Epoch, expressing it in the languages that information systems architects use in business. Before the publication of *Principia* in 1687, Newton spent much of his time at Trinity College, Cambridge searching for *prisca sapientia*, the pristine wisdom known to the ancients, as it was called during the Renaissance.[556] And in his rival Gottfried Leibniz's terms, this eternal wisdom was called *philosophia perennis*, as Aldous Huxley tells us in his anthology of these beautiful writings.[557]

Exponential rate of growth

Now while Teilhard's evolutionary model shows how the growth in the complexity of structures has been accelerating exponentially for the past fourteen billion years, it is not sufficiently detailed to help us see our place in the overall scheme of things. For, as the physicist Albert A. Bartlett has said, "The greatest shortcoming of the human race is our inability to understand the exponential function."[558] We have some sense of what 100 years is like or even 1,000, measured from our own lifespan of threescore years and ten, as the Psalmist put it.[559] But what is a billion years in our experience or a quintillion years?

In the 1930s, Edward Kasner tried to explain exponential numbers to his nine year-old nephew Milton Sirotta by asking him to create a name for a very big number.[560] Milton showed that he had more wisdom than his mathematician uncle imagined. For he coined the word *googol* for 10^{100},[561] which is just 100 orders of magnitude, still quite manageable by the mind. In 1997, Google adapted this term, a misspelling of *googol*, for its search engine, to denote its mission to organize a seemingly infinite amount of information on the web.[562] However, Milton went even further, also defining a googolplex as 10^{googol}, a name that Google has given to its headquarters. But what on earth is a googol orders of magnitude? Or a googolplex to the power of a googolplex three times, like this, a number that is quite beyond our imagination:

$$googolplex^{googolplex^{googolplex^{googolplex}}}$$

Yet, even raising a googolplex to the power of a googolplex googolplex times is tiny compared with infinity. So what is Eternity or an infinite number of years in our experience? The mathematical concept of infinity is not well known, even by scientists, for Georg Cantor proved in the 1870s that there is not just one infinite cardinal, there are an infinite number of them, which leads to some very strange arithmetic. It might be thought that the number of integers is larger than the number of positive ones. After all, the negative integers are omitted in such a set. However, it is possible to create a one-to-one mapping between these two sets, indicating that they have the same number of elements, called countable sets. So $\infty + \infty = \infty$.

Cantor denoted the cardinality of this countable set with $\aleph_0$ (aleph-null) and then proved that the cardinality of the real numbers, such as $\sqrt{2}$ and π, has $2^{\aleph_0}$ members. He then went on to prove that there are an infinite number of cardinals, the 'largest' being denoted by $\aleph_\infty$, where ∞ is $\aleph_\infty$, defined recursively, ad infinitum! But what then is Eternity or infinite time? If people egoically believe that a separate, immortal soul either reincarnates indefinitely or has everlasting life, which infinity are they referring to?

We can simply resolve this issue by making a clear distinction between *in*finity, which can never be reached, and *trans*fininty, which is ever present as the Nondual, Limitless Absolute. So when we live in union with the Divine, the idea of an immortal soul beautifully dissolves into the Immortal Ground of Being, as described on page 39.

What triggered my own researches into the root causes of the accelerating pace of scientific discovery and technological invention was David Attenborough's *Life on Earth* broadcast by the BBC in 1979. In the first episode of this enthralling television series, Attenborough graphically illustrated the exponential rate of evolutionary change. It is now some 3.6 billion years since the first self-reproducing forms of life appeared on this planet. So if we consider 10 million years to be a day, we can map the whole of evolution on this planet to the days of the year.[563]

Using this model, if 1st January marks the birth of single-cell organisms, then the first multicellular organisms appeared in the middle of August, with sexual reproduction beginning about six weeks later. Other significant events during the late autumn were the emergence of fish, land plants, and reptiles.

Then about the 10th December, both mammals and dinosaurs appeared, with mammals surviving the mass extinction that occurred on Christmas Day, one of seven and nine mass extinctions of land and marine forms of life so far in the life of the Earth, according to the *Times Atlas of the World*,[564] more than the five that is generally recognized today.

This catastrophe enabled the primates to appear on Boxing Day, to be followed by the hominids four days later. Then on New Year's Eve, the first exemplars of the *Homo* genus appeared around teatime. The whole of human evolution has thus taken place during the evening of the last day of the year, with *Homo sapiens* being born about 23:59:30. As we rapidly approach midnight on 31st December, we can see that the whole of mental evolution has thus taken place during the last three or four seconds, with the computer age beginning less than a single tick of the clock earlier.

Peter Russell provides a similar metaphor in *The White Hole in Time*[565] and its sequel *Waking up in Time*. He uses the 108 floors of the 400-metre-high former World Trade Center in New York as a measuring stick for evolution since the formation of the Earth some 4.6 billion years ago.[566] In *The Awakening Earth*[567] and its sequel *The Global Brain Awakens*, Peter extends his view of evolution still further back. To get a complete picture, we need to look at evolution as starting from the most recent big bang, some fourteen billion years ago.[568]

However, while these metaphors are useful in picturing humanity's position in the context of evolution as a whole, they are not sufficient to express Teilhard's evolutionary vision in a rigorous, scientific manner. I discovered how to do this when giving my first public presentation on the union of science and spirituality to the continental meeting of the UK's Scientific and Medical Network in Växjö, Sweden in the spring of 2000. There I met Nick Hoggard, who gave a presentation on a radically new theory of evolution he had developed from chaos/complexity theory, which he aptly called 'SuperEvolution', extending evolution backwards and forwards in time from biological evolution.

Nick got the idea for his theory of evolution from a eureka moment on 11th July 1999, when he was relaxing on a beach in Malmö. While thinking about a book titled *The Theory of Everything: The Existence of God Proved by the Time Science of the Maya*, which Carl Johan Calleman of Dalarna University had presented at the Holma College of Holistic Studies, Nick realized that he could turn what he called a 'wild and remarkable theory' into sound science, overcoming his initial scepticism.

To understand this, we need just a little mathematics, which I am otherwise doing my best to eschew in this book. As evolution is an accumulative process, exponentially building on what has already developed, the time periods between major evolutionary turning points can be represented in a diminishing geometric series, where each successive term gets shorter by a constant factor. But rather surprisingly, the sum of an infinite series of such terms is not infinite, as Zeno of Elia and many others, have believed. As David M. Burton puts it in *The History of Mathematics*, "Zeno pointed out the logical absurdities arising from the concept of 'infinite divisibility' of time and space."[569]

Burton points out that this apparent paradox can be resolved through the notion of a 'convergent infinite series'. As he says, "The paradox rests partly on the misconception that an infinite number of ever-shorter lengths (and, similarly, time durations) must add up to an infinite total."[570] But this is not the case. The sum of an infinite geometric series of diminishing terms has a finite limit. For instance, if we begin with 1 and successively halve the previous term, its sum is given by this expression:

$$1+\frac{1}{2}+\frac{1}{4}+\frac{1}{8}+\frac{1}{16}+\cdots=2$$

In general, the sum of an infinite series which begins with a and diminishes by a factor of d is given by this simple formula:

$$\frac{ad}{d-1}$$

This formula is universal, appearing wherever phenomena can be expressed in a geometric series of diminishing terms. For instance, it is used in fractional-reserve banking, as I explain in my 2014 treatise on 'The Theory of Everything'. If the required-reserve ratio is 10%, d is 10/9, and commercial banks can create up to ten times more new money as debt than they initially have on deposit at a central bank, effectively creating money out of nothing. As J. K. Galbraith writes in *Money: Whence It Came, Where It Went*, "The process by which banks create money is so simple that the mind is repelled."[571] It is not surprising that the entire world is in debt to the banks and that the gap between the rich and the poor is getting larger and larger with every year that passes, leading to the closure or reduction of some public services and social instability.

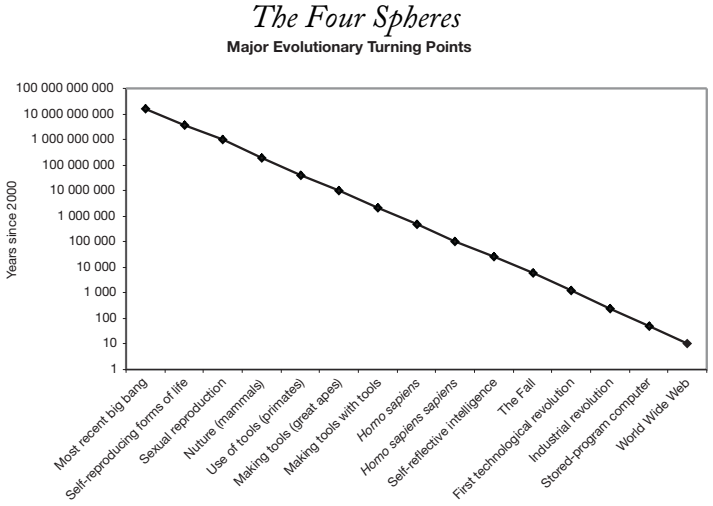
Now the Mayan calendar, which is uniquely exponential in character, follows the pattern of a diminishing geometric series until it nears its end. For the shortest time period is a day, called a *kin*. The calendar is not concerned with hours, minutes, seconds, and infinitesimal fractions of a second, as the mathematics requires. Expanding the time periods, twenty kins form a uinal and eighteen uinals form a tun, making the Mayan 'year' 360 days. Expanding further, a katun is twenty tuns and a baktun is twenty katuns, each of which occurs in thirteen cycles, perhaps because there were thirteen gods in the Mayan pantheon.

So the Great Cycle is 13×20^2 tuns, which is 1,872,000 days, about 5,125 years, roughly the time since the beginning of the full emergence of the noosphere at the beginning of the patriarchal epoch. In popular culture, this mapping has given rise to the notion that the end of the Mayan calendar occurred at the winter solstice in 2012, marking the middle of the transition period between the last two stages of humanity's existence. However, as Carl Johan has pointed out, the Mayans gave names to much longer periods of time, the longest being the hablatun, which is 20^7 tuns. A cycle of thirteen hablatuns is thus 5,990,400,000,000 days, which is about sixteen and a half billion years, the same order of magnitude as the generally accepted time since the most recent big bang.[572]

So if we take this number as the sum of an infinite geometrical series of diminishing terms, d and a in the formula above would be 20 and 5,690,880,000,000, respectively. However, what Nick noticed on his day at the beach is that the Mayan mapping is too crude. It omits one of the most significant turning points in evolutionary history, what is generally called the birth of life on Earth, at the beginning of biogenesis in the biosphere, some three and half billion years ago.

Nick then realized that this momentous event could be interpolated in a mapping of evolutionary history by taking d in the formula above as $\sqrt{20}$, which is 4.472, reasonably close to 4.669, the first Feigenbaum constant in systems theory. By viewing evolution as a series of bifurcating systems, Nick was then able to interpolate several other significant turning points, producing the diagram on the next page, which I have slightly modified.

Nick was not the first to view evolution in terms of systems theory. The first book I read in this vein in 1980 was *The Phenomenon of Science*, by the Soviet dissident Valentin Turchin, who explored the history of evolution in terms of cybernetics,[573] apparently inspired to do so by *The Phenomenon of Man*, the title of the first translation of Teilhard's *Le phénomène humain*. Béla H. Bánáthy's *Guided Evolution of Society: A*



Systems View is another book I have since discovered. And the biologist Elisabet Sahtouris is well known for presenting biological evolutionary processes in terms of conventional systems theory.[574]

In terms of bifurcating systems, Nick likened his model to that of a dripping tap. As a tap is turned on, the distance between the drips becomes smaller and smaller until the drips eventually merge, when the tap is turned full on at what is called the accumulation point in systems theory. At this singularity point, the sum of the infinite geometric series of diminishing terms reaches its finite limit.

So when is evolution going to reach its Accumulation Point in this model? Well, this is not an exact science. Nevertheless, a simple calculation shows that evolution reached its glorious culmination in 2004, give or take a couple of years, a calculation that matches very well with my own ontogeny. In terms of human phylogeny, the difference between this date and 2012 is not significant in the overall scheme of things.

Another who has made a similar calculation is Terence McKenna, who, following a psychedelic experience with his brother Dennis in 1971 in Amazonian Columbia, developed an evolutionary theory called Timewave Zero, indicating the "termination of normal time and an end to ordinary history".[575] Such psychotropic experiences can be life-changing, as Ralph Metzner tells us in *The Expansion of Consciousness*, "a psychedelic experience … typically leads to a more or less total deconstruction of one's worldview, the model of reality and of social relations that we have come to accept through our upbringing and education."[576]

In Terence McKenna's case, opening up to the entire Cosmos led him to view time as a series of hierarchical timewaves, resonating with each other within greater and lesser timespans, somewhat like fractals, with their property of self-similarity. Within each timewave, he saw time "as the ebb and flow of two opposed qualities; novelty and habit, or density of connectedness versus disorder". So even though he believed in the absolute truth of the second law of thermodynamics, he saw that in localized areas entropy could decrease through *concrescence* 'growing together', a recent instance being the appearance of language,[577] using Alfred North Whitehead's notions of novelty and concrescence.

It was this sense of wholeness that drew Terence to *I Ching* in which to express his psychedelic vision. As he said, "The *I Ching* is a mathematical divinatory tool of great age whose probable origin is the mountainous heart of Asia—the home of classical shamanism and Taoist magic". So as "divination is the especial prerogative of the shaman, whatever the cultural context … the unconscious contents which our experiment made accessible were constellated around the *I Ching* because it is particularly concerned with the dynamic relationships and transformations that archetypes undergo."[578]

As the *I Ching* is the 'Book of Changes', Terence then used the transitions between the 64 hexagrams in the King Wen sequence of transitions to create a rather complex structure that he called the 'eschaton',

from Greek *eskhatos* 'last', defining *eschaton* as 'a universal and fractal morphogenetic field', a quantized wave-particle of time.[579] The eschaton is so named because at Timewave Zero, McKenna visualized that novelty would reach its evolutionary maximum through ultimate concrescence, not unlike Teilhard's Omega Point. This means that following evolution's Singularity, there are no longer any inhibitors to creativity, no paradigms or dogmatic religious, scientific, or economic worldviews preventing evolution flowing with its full power.

However, it was not until 1986 that McKenna began working with Peter Meyer to develop software that could translate the former's mathematical intuitions into the core algorithm in Timewave theory. I outline the ingenious mathematics that Meyer developed in a 2011 essay on 'The Singularity in Time: The Omega Point of Evolutionary Convergence'. In his fractal formula, *d* in the formula above is 64, showing its ubiquity.

But just because evolution has now passed the most momentous turning point in its fourteen billion-year history does not mean that evolution has now come to an end. On the contrary. The principal difference between evolution in the past and evolution today is that no more discrete turning points can be discerned. The evolutionary tap is now turned full on, flowing continuously, with no limits on its development within the limitless Numinosphere, once we let go of our mechanistic cultural conditioning.

A discontinuity in evolution

So what does all this mean for the future of humanity? Well, the evolutionary tap can only flow with unlimited synergistic creativity if there are no blocks inhibiting evolution's relentless quest for Wholeness at its Omega Point. Yet, today, there is widespread resistance to change, which Vimala Thakar highlights in the opening paragraph of *Spirituality and Social Action: A Holistic Approach* with these wise words: "In a time when the survival of the human race is in question, continuing with the status quo is to cooperate with insanity, to contribute to chaos." She therefore asks, "Do we have the vitality to go beyond narrow, one-sided views of human life and to open ourselves to totality, wholeness?" For as she says, "The call of the hour is to move beyond the fragmentary, to awaken to total revolution."[580]

What this means is that we cannot realize our ultimate destiny as a species from within any existing civilization on Earth today. As the wag said when a visitor in town asked him to way to the train station, "You cannot get there from here." As some can see today, there is a new civilization appearing out of the ashes of the old. Most significantly, Western civilization must die to give the next few generations any chance of having healthy and fulfilling lives. For traditional religion, science, and economics are all based on the false belief that we humans are separate from each other and the Divine, which has led them to be based on the seven pillars of unwisdom, listed on page 29. So the only viable future for humanity is to rebuild the entire infrastructure of society on the seven pillars of wisdom.

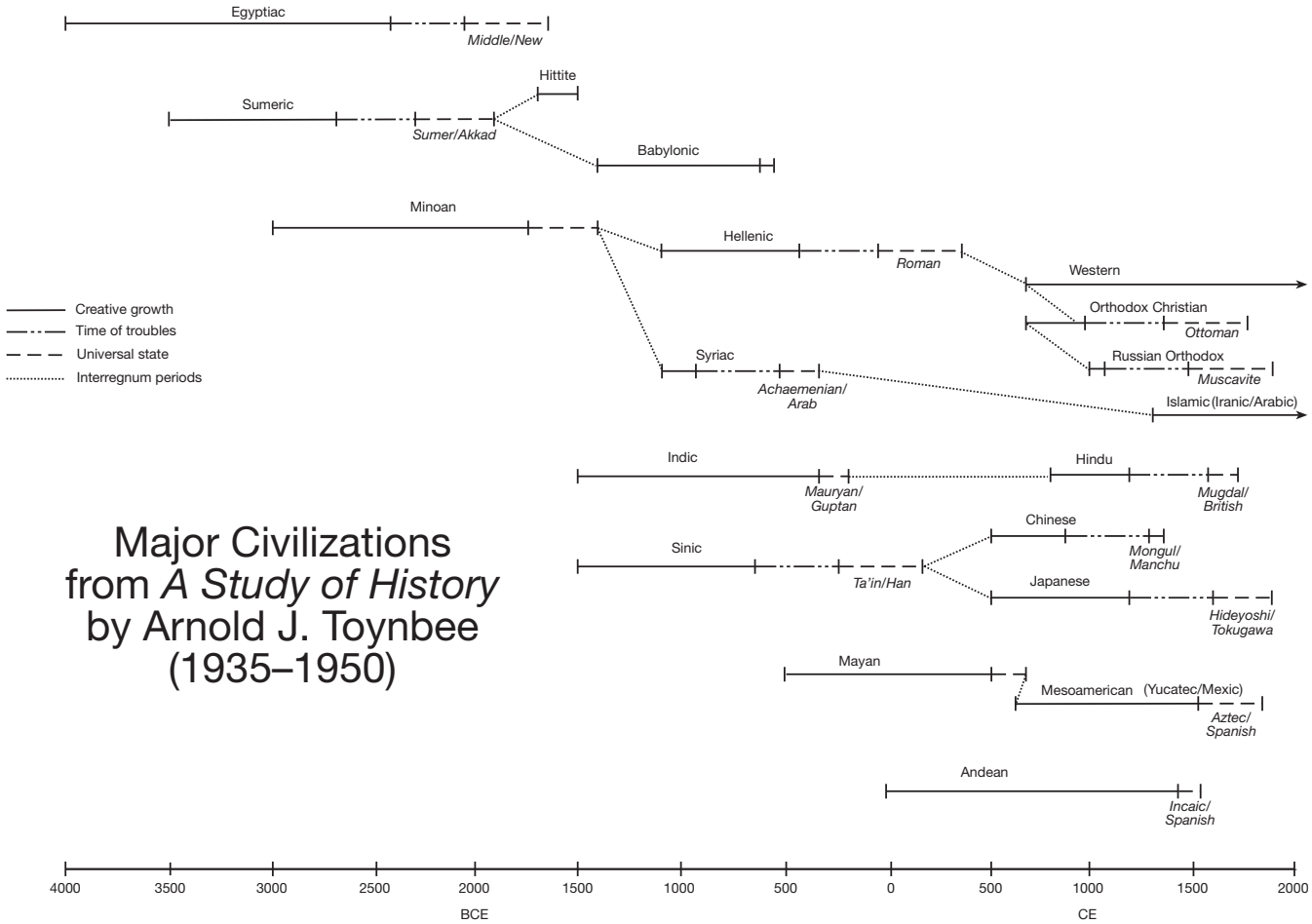
One of the first to see the absolute necessity for this evolutionary discontinuity was Oswald Spengler, who began his investigations in Germany before the First World War, publishing the results of his inquiries in two volumes of *The Decline of the West* in 1918 and 1923.[581] During the twentieth century, it thereafter became increasingly obvious to a growing number of thinking, feeling people that Western civilization, in particular, and the human race, in general, is in very deep trouble. It is easy to point at the well-over hundred million people who were killed in two World Wars, and in genocides as evidence of our insanity. But we see inanity everywhere, including in science and business.

Since then, there has been a widespread belief that technological development can solve humanity's problems and can drive economic growth indefinitely. R. Buckminster Fuller is a spokesman for the

general belief in the supremacy of technology over humanity, described in a collection of twelve essays titled *Utopia or Oblivion: The Prospects for Humanity*. As the blurb on the back cover of the book states, "Each essay illuminates his basic conviction that Utopia can be attained, and ecological disaster forestalled by imaginative and fearless use of our most modern technological discoveries."[582]

Yet, we humans are the leading edge of evolution, not machines with so-called artificial intelligence. So it is of the utmost importance that we give up our obsession with technology within materialistic, mechanistic science, as many have pointed out, such as Erich Fromm,[583] José Argüelles, and Henryk Skolimowski, with their books *To Have or To Be?*, *The Mayan Factor: Path beyond Technology*,[584] and *Philosophy for a New Civilisation*.[585]

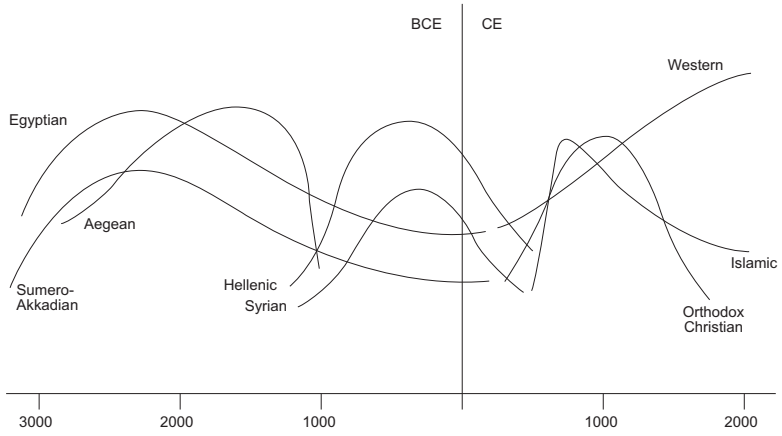
To put these momentous changes in perspective, I find it useful to look at all the civilizations that have emerged, flourished, and died during the patriarchal epoch. Between 1936 and 1950, Arnold Toynbee distinguished about twenty such civilizations in *A Study of History*, a 12-volume tome measuring half a metre in the University of Stockholm library, where I consulted it in the 1990s. Using the generalizing principle of pattern recognition that we all use, he saw that civilizations go through various stages, the most important of which are creative growth, a time of troubles, and a universal state, when the creative energies that originally brought the civilization into being become ossified. Thankfully, D. C. Somervell has produced a two-volume abridgement of this magnum opus, enabling us to depict the timeline of these civilizations in this diagram, the only two extant today being the Western and Islamic civilizations.[586]



Toynbee summarized the reason for the death of civilizations in this way, which quite clearly applies to Western civilization today:

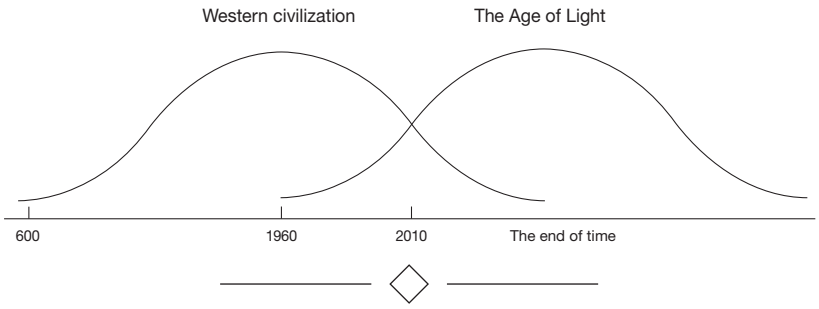
> The nature of the breakdowns of civilizations can be summed up in three points: a failure of creative power in the minority [the leaders who brought the civilization into being], an answering withdrawal of mimesis [imitation] on the part of the majority, and a consequent loss of social unity in the society as a whole.[587]

In *The Turning Point*, Fritjof Capra depicted the rise and fall of some of these civilizations around the Mediterranean, reproduced below.[588] The important point to note is that all, with the exception of Western civilization, have the bell shape of the logistic distribution curve, although it is clearly premature to indicate that the Islamic civilization is dying. This is because, by the Principle of Unity, evolution must be balanced by a period of decay.



Today, the three dominant civilizations in the world, Christocentric Western civilization, the Islamic, and the emerging Chinese totalitarian capitalism have lost the creative power that brought them into existence. So they must all die so that the Age of Light, a society soundly based on Love and Peace, Life and Freedom, Wholeness and the Truth, and Consciousness and Intelligence, can emerge.

This is a rather tricky situation, for as spiritual seekers in the wealthy West are beginning to easternize Western civilization, the political focus in India and China, in particular, is to westernize the more impoverished East, losing touch with its mystical foundations. Then there is all the turmoil in the Middle East, with the many religious wars being fought within this region and with the world at large, leading to a major migration crisis in Europe in 2015. So it is not easy to see how this will play out in the coming decades, for the next diagram, an extension of one in Fritjof Capra's *The Turning Point*, is a rather simplistic view of the death and rebirth of civilization as we know it today.[589]



To put some further flesh on these bare bones, another who sees such a death and rebirth of civilization is Jean Houston, who met Teilhard in Central Park in New York when in her teens, when 'Mr Tayer', as she knew him at the time, would sometimes talk about the Omega Point on the walks they took together.[590] Jean calls the changes that evolution is making today 'Jump Time', writing, "Jump Time is a whole system transition, a condition of interactive change that affects every aspect of life as we know it."[591] As she says, "Ours is an era of quantum change, the most radical deconstruction and reconstruction the world has seen."[592]

Another with a similar vision is John L. Petersen, founder of the Arlington Institute in 1989, as a think tank to "serve as a global agent for change by developing new concepts, processes and tools for anticipating the future and translating that knowledge into better present-day decisions". John is not a

flaky New Ager, for he has formerly worked in various governmental and political positions in the USA, setting up a portal for what he sees as the World's Biggest Problems: Economic Collapse, Peak Oil, Global Water Crisis, Species Extinction, and Rapid Climate Change.[593]

As Petersen says in *A Vision for 2012*, we are currently entering a "historical, epochal change—a rapid global shift unlike any our species has lived through in the past. … There are no direction-pointing precedents for what is coming, … there is no one alive today who [has] lived through anything like what we're anticipating."[594]

Well, this is not quite true, for the author of this dissertation is at least one who has already lived through what the rest of the human race is yet to experience. From a social perspective, the key issue here is which of two possible scenarios that John outlined in an interview in the June–August 2009 issue of *EnlightenNext* is more likely: "with the internet or without the internet". If you don't have the Internet, something really bad has happened, but with the Internet, the shock wouldn't be so disastrous as it would if it all came down. He went on to say:

> So we don't want a crisis that is so bad that it collapses the whole system. We want this kind of finely engineered middle-ground disruption to scare everybody, grab them by the lapels, and say, "We can't do this anymore!" It convinces everybody that they have to redesign their lives, but you don't lose the infrastructure. You can rebuild around something rather than rebuild the entire infrastructure.[595]

As the Internet is implicitly built on Integral Relational Logic, the commonsensical art and science of thought that we all use everyday, no matter what our cultural background might be, the Internet could provide the continuity we need as the financial infrastructure of society collapses around our ears. Yet, we have so little time. For Petersen described what is far more likely to happen in an interview in the *What Is Enlightenment?* magazine in July-September 2007, with the title 'The End of the World As We Know It?':

> As far back as 1986, I figured out that there was a whole string of potential events that were converging and could result in major disruption within twenty-five years. Around the same time, I discovered the work of Chet Snow and Helen Wambach who together wrote a book, *Mass Dreams of the Future*, based on their work doing remote viewing exercises [clairvoyance under hypnosis]. They asked twenty-five hundred people to envision the United States in the year 2030. About eighty-five percent of them reported the same thing: It's a place with no government, divided politically into four quadrants, and everyone is living in small communities, some of which are defensive and full of guns and others where people cooperate and work together.[596]

Another with a similar perspective is James Lovelock. In a BBC Hardtalk interview in 2010, Stephen Sackur asked him, "What do you think is a viable [population] that Gaia, the planet, can sustain?" Lovelock replied, "I would guess, living the way we do, not more than one billion, probably less". At which Sackur said, "But that's postulating the most dramatic and terrible and unimaginable cull of the human species." To which Lovelock calmly replied, I think it will happen in this century. It will take a miracle for it not to.[597]

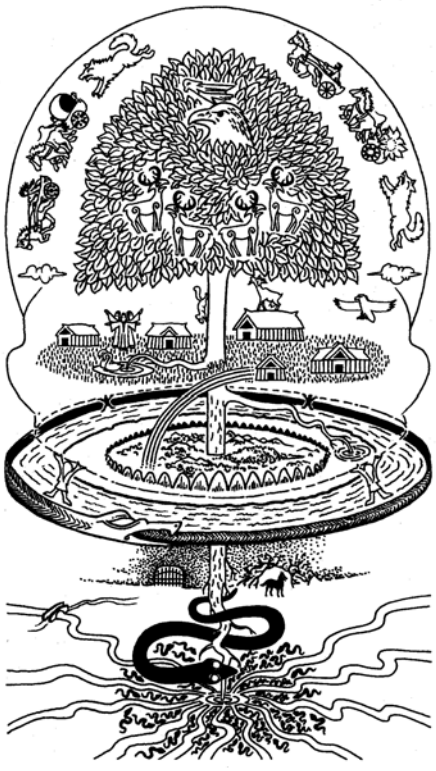
To obtain further insight into these prognostications, we can obtain some understanding from the creation and end-times myths in many cultures through the ages. For as we humans all live in the same Cosmos connected to all other beings through space and time, our deepest inner experiences can reveal the Universe's innermost secrets, expressed through the ages in a multitude of different ways.

For instance, Icelanders wrote down the myths in Old Norse mythology in poetic form around the turn of the first millennium, today called *The Poetic Edda*. Then, in the thirteenth century, after Iceland's conversion to Christianity, Snorri Sturluson preserved these myths in *The Prose Edda*, seeing the similarities between Old Norse myths and the Christian creation and end-times stories.

What the *Eddas* predict is that at the end of time, the gods will fight mighty battles, bringing about their destruction at *Ragnarök* 'doom or end of the gods', related to *Ragnarøkkr* 'darkness or twilight of the gods', made famous in Richard Wagner's opera *Gotterdammerung*. But it is important not to think of this Cosmic event just in destructive terms. As the linguist Haraldur Bernharðsson points out, the Old Icelandic word *røkkr* refers to both the 'beginning of daylight' (sunrise) and the 'end of daylight' (sunset). Similarly, *rök* had the sense of both 'origin', as a beginning, and 'destiny', as an end. So the *ragnarök* of Old Norse mythology has a both-and meaning, describing not only the destruction of the world, but also its rebirth, in a 'renewal of the divine powers'.[598]

Similarly, in Christian end-times philosophy, recorded in the Book of Revelation, John of Patmos said, "I am Alpha and Omega, the beginning and the end, the first and the last."[599] *Revelation* is a translation of Greek *apokalupsis*, from *apokaluptein* 'to uncover' or 'to reveal', from the prefix *apo* 'from, away' and *kaluptra* 'veil'. So *apocalypse* literally means 'draw the veil away from', indicating the disclosure of something hidden from the mass of humanity: the Hidden Harmony.

Just two humans survive the apocalyptic battle in Norse mythology, a woman and man named *Líf* 'Life' and *Lífþrasir* 'Life yearner', living in *Gimlé* 'Heaven', where there are two halls named *Brimir* and *Sindri* 'sparkling', where good and virtuous people will live.[600] This is in contrast to *Hel*, where wicked people go after death, from PIE base *kel-* 'to cover, conceal, save', also root of *hell*, *apocalypse*, *clandestine* 'secret', and *colour* 'that which conceals'.



These momentous events take place within the context of the Norse Cosmos, depicted as a World Tree, called *Yggdrasil*, whose branches spread majestically over all lands, illustrated here. In Jesse L. Byock's words, "This *axis mundi* or cosmic pillar at the centre of the world is described as a giant ash, binding together all the disparate places of the universe, and it serves as a symbol for a dynamic cosmos."[601] However, while *Yggdrasil* trembles during the battle of the gods, it is unclear from the *Völuspá* or *Seeress's Prophecy* in *Poetic Edda* whether it survives this Cosmic battle.[602]

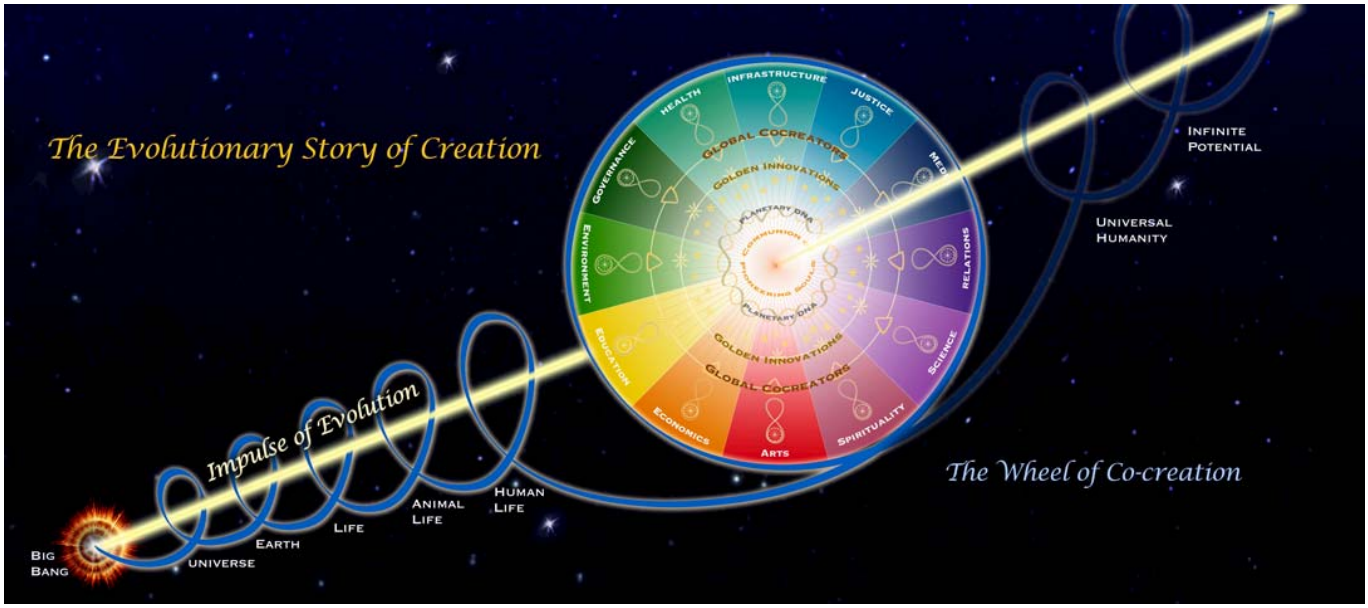
Yggdrasil is a symbol for the underlying structure of the manifest Cosmos, which Integral Relational Logic tells us is an infinitely dimensional network of hierarchical relationships. As this structure is independent of any interpretations we might make of the data patterns of our experience, having evolved from the Internet, *Yggdrasil* will survive the apocalypse that humanity is about to pass through. So with the Numinosphere providing the Cosmic Context and Gnostic Foundation for all our lives and with IRL providing the coordinating framework in the noosphere, we still have a chance, albeit a very tiny one, of surviving the apocalypse we are about to pass through relatively unscathed.

The humans who emerge from this apocalyptic discontinuity in evolution will embody a fully awakened species, fulfilling humanity's ultimate destiny. But this emerging species is neither a technological nor a biological one; it is a psychospiritual species. We cannot therefore leave it to the biologists to name such a species.

What then could we call it? Well, Eckhart Tolle refrained from making any suggestions in *A New Earth*. However, Barbara Marx Hubbard, author of *Conscious Evolution*, founder of the Foundation for Conscious Evolution, the Evolutionary Edge, Birth 2012, and the Agents for Conscious Evolution (ACE) training, has done so. In a letter to the *What Is Enlightenment?* magazine in 2005, she suggested several names for our emerging species: *Homo universalis*, *Homo noeticus*, *Homo spiritus*, and *Homo sapiens sapiens sapiens*.[603]

For Barbara, who Deepak Chopra calls "THE voice for conscious evolution in our times,"[604] conscious evolution "is a quest to understand the processes of developmental change", a new worldview that is the opening of the next stage of human development, "the second great event in the history of the universe", the first being the most recent big bang which supposedly brought it into existence.[605] Together with the Chopra Foundation, the Source of Synergy Foundation, and the Association for Global New Thought, on 26th July 2008, she helped to set up a group of Evolutionary Leaders, with the motto 'In service to conscious evolution'.

Continuing her pioneering endeavours, in 2015, Barbara conducted an extensive twenty-week course on the Internet titled *The Sacred Journey of the Conscious Evolutionary 2.0*, presenting the following diagram as her Cosmic model of evolution as a whole, outlined in her 1998 book on *Conscious Evolution*.[606] In the second edition of this book in 2015, to reflect Teilhard's vision of evolutionary convergence, the Wheel of Cocreation has evolved into twelve sectors, named Infrastructure, Justice, Media, Relations, Science, Spirituality, Arts, Economics, Education, Environment, Governance, and Health. The purpose of the model seems to be to give global cocreators working in each of these specialist fields a common worldview that they can all share.[607]



Sadly, however, although this model is highly attractive, it is not Realistic. Most significantly, it does not reflect evolution's involutionary opposite, which is necessary if we are to return Home to Wholeness, which is *trans*finite, not *in*finite, as the model indicates. Indeed, the push and pull of opposites towards Nondual Divinity makes it a little tricky to find suitable names for our emerging species. Furthermore, to clearly denote the way that human evolution has evolved during the past 25,000 years, we really need to look afresh at our taxonomical conventions.

First, we could most suitably call the species that emerged at the birth of noogenesis in the noosphere some 5,000 years ago *Homo noeticus*, one of Barbara's suggestions in 2005. But rather than balancing

divergence and convergence, mental evolution has been predominantly divergent, leading to split minds and much delusion. It is only in the last few decades—since the end of the Second World War and Teilhard's masterpiece was published—that evolution has begun to converge into the megasynthesis that he prophesied. To reflect this momentous change in evolutionary history, we can aptly say that *Homo noeticus* is now evolving into *Homo universalis* in the noosphere at the peak of evolutionary convergence, which is Barbara's favoured term.

However, this is not the end of the story. Today *Homo universalis* is being transformed into *Homo divinus*, a species living in union with the Divine in the Numinosphere, realized more through the dying process of involution than the growing one of evolution. Yet, again, *Homo divinus* is not a new species for all beings, living and 'non-living', are never separate from the Divine for an instant. It is perhaps 25,000 years ago that a species began to be aware of this fact, when *Homo sapiens sapiens* was given the great gift of Self-reflective Intelligence, as what Barry Long called a 'veil of opaqueness' or 'psychic membrane' was cleared away from our animal eyes.[608]

But this did not last. Our forebears did not understand what had happened to them, for they were like innocent infants in adult bodies with just primeval conceptual maps to guide their behaviour. Then as these mental maps grew in complexity, they began to obscure humanity's innate Divinity, especially in cultures based on the Abrahamic religions, leading us into delusion with split minds.

For Intelligence cannot fully function when it is occluded by what an anonymous fourteenth-century English mystic called the 'cloud of unknowing'. He wrote that to find God it is necessary to put a cloud of forgetting between the meditator and the world,[609] not unlike Ramana Maharshi's Advaita teachings, mentioned on page 42. So while *Homo noeticus* began to dominate human affairs, a tiny number of mystics rediscovered their divinity as *Homo divinus unitas*, a subspecies living in unity with the Divine through No-mind, following the small bell curve in the diagram on page 22. The most notable exemplars of *Homo divinus unitas* in ancient times were Shakyamuni Buddha, Lao Tzu, and Jesus of Nazareth. But there have been a fair number of other genuine mystics since then, including more than a few today.

However, *Homo divinus unitas* is not a subspecies that can tell us how to intelligently manage our business affairs in harmony with the fundamental laws of the Universe. And neither can *Homo noeticus*, with its many cultural subspecies, typified by fragmented, deluded, and schizoid minds or *Homo universalis*, at the peak of evolutionary convergence.

Rather, where evolution and involution are carrying humanity today is into a species that unifies mysticism and science, the unification of *Homo divinus unitas* and *Homo universalis*. Perhaps the most appropriate name that we can give such a subspecies is *Homo divinus holoensis*, from Greek *ὅlē* 'whole' and *-ensis* 'belonging to', following the large bell curve in the ontogenetic diagram on page 22. So members of *Homo divinus holoensis* do not belong to any group, whether this be national, religious, cultural, racial, sexual, specialist, or whatever, for they belong to the Ineffable, Nondual Whole, having reached evolution's glorious culmination, which Teilhard called its Omega Point, inseparable from the Alpha Point.

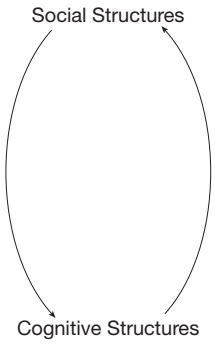
But to what extent the predominant *Homo noeticus* is destined to evolve and involve into *Homo divinus* before *Homo sapiens* becomes extinct as a biological species within the next few generations is most uncertain. For to do so, we humans need to be totally free of our mechanistic conditioning, as Osho foresaw, calling the emerging superintelligent, superconscious species *Homo novus* or Zorba the Buddha,

representing a new synthesis of East and West, the meeting of all polarities.[610] As he said, "The new man is not an improvement upon the old; he is not a continuous phenomenon, not a refinement. The new man is the declaration of the death of the old, and the birth of an absolutely fresh man—unconditioned, without any nation, without any religion, without any discriminations of men and women, of black and white, of East and West, or North and South."[611]

In *The Ghost in the Machine*, Arthur Koestler gave an explanation of how new species can emerge from previous ones in this manner with the word *paedomorphosis* 'the shaping or forming of the young', in contrast to *gerontomorphosis*, when evolution progresses from immediately preceding forms and structures, terms that were introduced by Walter Garstang and Gavin de Beer, respectively

In *gerontomorphosis* ontogeny recapitulates phylogeny, as new-born individuals biogenetically mimic their parents. However, as Koestler puts it, "gerontomorphosis cannot lead to radical changes and new departures; it can only carry an already specialized evolutionary line one more step further in the same direction—as a rule into a dead end of the maze."[612]

During paedomorphosis, on the other hand, evolution retraces its steps to an earlier point and makes a fresh start in a quite new direction, when phylogeny recapitulates ontogeny. Paedomorphosis is thus a rejuvenating, renascent process; it leads to new vitality, new energies, and new possibilities.



These principles of paedomorphosis and gerontomorphosis apply equally in the noosphere, the prime example being the Copernican revolution in the seventeenth century. For Copernicus effectively went back to Aristarchus's heliocentric view of the solar system, Aristarchus being called the Greek Copernicus,[613] abandoning Aristotle and Ptolemy's geocentric view, which was generally accepted at the time. And generally, paedomorphosis does not begin on the scale of the species; it begins at the individual level, breaking the social-cognitive cycle that drives so much human learning today, illustrated here. For we live in cultures and subcultures that attempt to coerce us to live according to the norms of the group, inhibiting us from realizing our fullest potential as human beings, from finding our true purpose in life, as both individuals and as a species.

Paulo Coelho, author of *The Alchemist*, experienced just such a situation as an adolescent, when he wanted to be an artist against his parents' wishes, three times being sent to a mental hospital to 'cure' him of his 'madness'. In the 1990s, discovering many others in a similar situation, he wrote an influential novel titled *Veronika Decides To Die*, which celebrates individuals who do not fit into patterns society considers to be normal, becoming free of the collective madness that is called sanity. As Coelho wrote in the afterword for this brilliantly insightful and inspiring book, "Between normality and madness, which are basically the same thing, there exists an intermediary stage: it is called 'being different'."

Like Coelho, we all need the courage to be different—different from our parents, who were taught what they knew by their parents and so on backwards in time for thousands of years, pointing out to the courtiers in our lives that the emperor is wearing no clothes, just like Socrates.[614]

For Western civilization, which still dominates the world through the global economy, has reached an evolutionary cul-de-sac, inhibiting the emergence of *Homo universalis* and *Homo divinus*. If we humans are to reach our fullest potential as a species before it becomes extinct, evolution thus needs to pass through a discontinuity in a paedomorphic process, rejuvenating society. This means demolishing the seven pillars of unwisdom on which Western civilization is based, rebuilding the education and economic systems on the seven pillars of wisdom, recognizing that none of us is separate from God, Nature, or any other being for an instant.

Transforming the work ethic

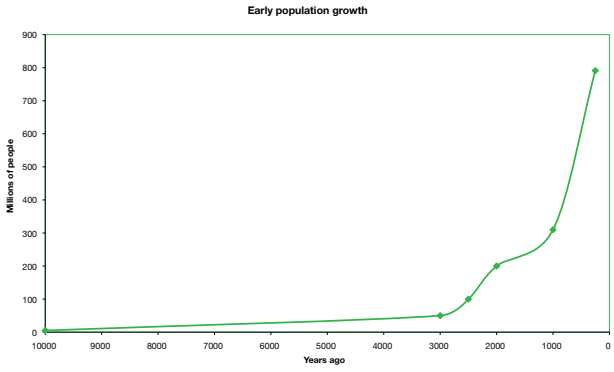
However, we need to recognize (know again) that even *Homo divinus* is not destined to live forever, no matter how awakened we might become. For when we live in union with Divine we realize (make real) that we actually have no choice in how we live our lives, a notion encapsulated in Ramesh Balsekar's *Who Cares?!* God's will is our will, governed by the Hidden Harmony, the fundamental design principle of the Cosmos. So at the Omega-Alpha Point of evolution and involution, there are no separate beings to care about humanity's ultimate destiny.

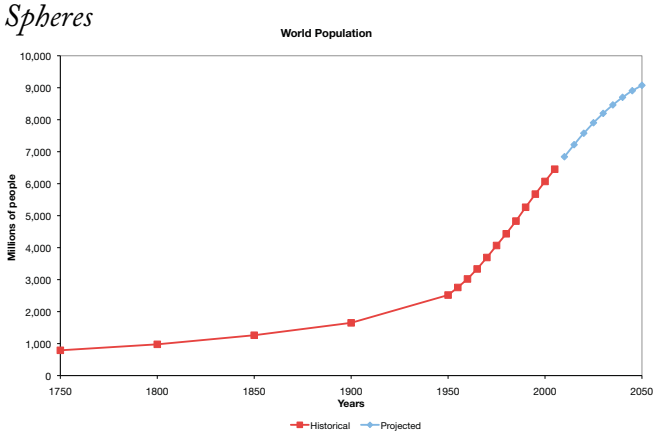
Of course, as compassionate human beings, we *do* care about our fellow human beings, especially our children, grandchildren, and other 'loved ones', a term often mentioned in the media following catastrophes, like airplane crashes. But it is vitally important that we accept the inevitability of death in all its forms, completely free from attachment to the entire world of form, including our body-mind-soul organisms and our nearest and dearest. Otherwise, we cannot become fully alive while still in our bodies, free of existential fear, called *jivan-mukti* in the East, from Sanskrit *jīv* 'to live' and *moksha* 'liberation from worldly bonds'.

I sometimes use two terms to denote the fear of change. First, we pretend change is not happening by burying our heads in the sand, which I call the Ostrich syndrome, trying to hold on to the status quo, that which we are familiar with. Secondly, we try to stop change—the Canute syndrome—trying to prevent the tide coming in.

If we are to face our existential fears with courage and fortitude, it is vitally important that we have as clear an understanding of the human situation as possible. To this end, I find it helpful to look at the growth of the human population since we stopped being hunter-gatherers to settle in villages, which grew into towns and cities. This growth is depicted in the two charts below, first from 10,000 to 265 years ago, then from 1750, projected to 2050.[615] These two graphs show the characteristic S-shape of the growth curve, with a very slow beginning, in this case, which is today beginning to reach its saturation point, as projections of population growth level off.

This is what the growth of the world population looked like to someone living in 2010, when I extracted these figures from the Web to draw the charts. But someone living at the time of Pythagoras could not have foreseen this rapid growth just two and half millennia later. Neither could Gregory King, who estimated the population of England and Wales at around five and half million in 1688, the year after the publication of Newton's *Principia*, when employed at the College of Heralds. In this survey, King

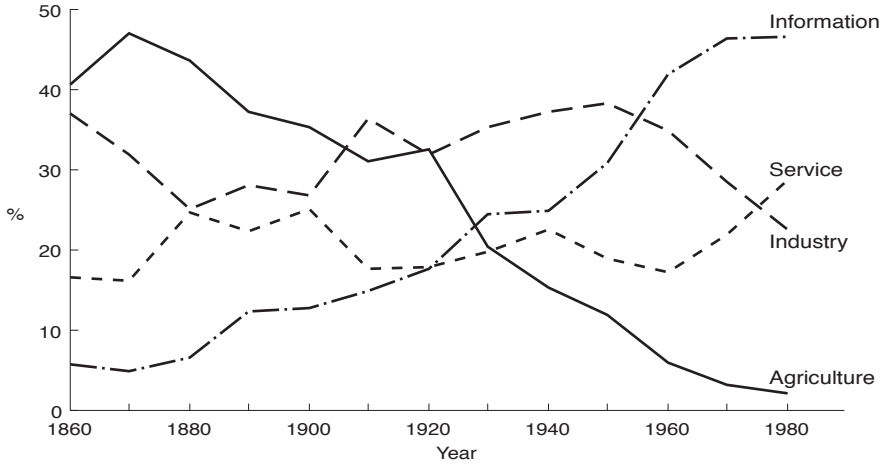




estimated that nearly 80% of the population of around five and half million were engaged in agricultural work, either as employers or labourers.[616]

Then during the years of the industrial age, the number of agricultural workers fell dramatically, so that by 1976 just 3.3% of the working population in the UK was engaged in the extractive industries, which include forestry, fishing, and mining, as well as agriculture.[617] At that time, 39.5% of the employed population was working in the industrial sector, consisting of the manufacturing, utilities, and construction industries, with the remainder in a wide variety of service industries. So even then the number of industrial workers was declining rapidly as the industrial age was giving way to the Information Society.

There has been a similar trend in the USA during the last two centuries of the second millennium. This is clearly shown in the diagram below, using a four-sector classification of Agriculture, Industry, Service, and Information. During just these 120 years, the agricultural sector dropped from 40.6 to 2.1% of the workforce, while the information sector increased from 5.8 to 46.6% of people in work.[618]



We can see from this chart that for the best part of half a century we have been living in a post-industrial 'Information Society', with radical implications for economics, as Daniel Bell's statement on page 13 indicates. For information is not a physical object, giving it some rather strange properties in conventional economic terms. For instance, when I buy a loaf of bread, the object passes from the storekeeper to me in exchange for money. However, when a teacher gives pupils some information, nothing is exchanged. Both teachers and pupils have the information. As Tom Stonier has said in *The Wealth of Information*, "Whereas material transactions can lead to competition, information transactions are much more likely to lead to cooperation—information is a resource which can be truly shared."[619]

Yet, today, to make the meaning of information fit into quantitative and materialistic economics, we have reified information, turning it into an object that can be bought and sold, like washing powder, including money, as a type of information. So we have intellectual property laws, such as copyright,

patent, and trademark, defending the belief that human beings are the originators of what is created through them, ignoring the role that Life or God the Creator plays in creativity.

As we see in the diagram on page 123, the Information Society is today evolving into the Knowledge Society, as a series of articles in the *Harvard Business Review* indicate,[620] and into the Wisdom Society, a term that Winston Franklin seems to have coined when President of the Institute of Noetic Sciences (IONS). But even this does not go far enough. Members of *Homo divinus* will be living in the Mystical Society, a term that I first used in an essay in 2004 as a precursor to my first book *The Paragonian Manifesto*. This means that the invention of the stored-program computer requires us to make the most fundamental change in the work ethic that has prevailed since humans began to settle in villages to cultivate the land and domesticate animals some 10,000 years ago.

We can see this most clearly by recognizing that the S-shape of the growth of the human population is an example of Pierre-François Verhulst's logistic function, mentioned on page 101. But this curve is just the left-hand side of the logistic distribution curve, whose right-hand side illustrates the decline of human population towards zero.

Seven simultaneous turning points

In summary, to realize our fullest potential as a species, we need to pass through seven simultaneous turning points, bringing to an end seven epochs or periods of time of various durations. Here is a brief overview of these different levels:

1. We are now entering the fourth and final spiritual phase of evolution, the most momentous change in some fourteen billion years of evolution since the most recent big bang.
2. A gnostic species, which we can call *Homo divinus*, is evolving from *Homo sapiens*, which is maybe some 500,000 years old. And the subspecies *Homo sapiens sapiens* is generally regarded as around 200,000 years old. Our ancestors acquired self-reflective Intelligence, the most important distinguishing characteristic of human beings, around 25,000 years ago, as evidenced in cave drawings from that time.
3. The selfish, patriarchal, mental-egoic epoch (me-epoch) that emerged at the dawn of history some 5,000 years ago, marked in the West by the Fall in the mythical Garden of Eden, is coming to an end. It is being replaced by a healthy, cooperative epoch of universal spirituality (us-epoch).
4. A both-and, nonlinear science of reason is emerging that is radically different from the either-or principles of deductive logic laid down by Aristotle some 2,350 years ago.
5. Christocentric Western civilization, which emerged from the death of the Hellenic civilization more than 1,400 years ago, is dying, to be replaced by the Mystical Society,[621] a society soundly based on Love and Peace, Life and Freedom, Wholeness and the Truth, and Consciousness and Intelligence.
6. Scientific materialism and mechanism of the last three or four hundred years are dying, to be replaced by a gnostic, vital science that recognizes that Consciousness, not the physical universe, is the primary reality.
7. The monetary economies of capitalism and communism, which threatened to blow us all up during the second half of the twentieth century, are dying, giving way to a life-enhancing, ecologically sustainable Sharing Economy, in which we shall all be empowered to reach our highest potential as human beings.

8. Entering the Age of Light

Given that *Homo sapiens sapiens* will inevitably become extinct one day, the sixty-four-thousand-dollar question is "When?" And as a corollary, what will cause the human population to go into decline and how are we to live during the eschatological Age of Light? I have pondered over these life-and-death questions almost every day since I realized that I had reached the Omega Point in evolution when living and working in Kuwait some 13,000 days ago, almost half a lifetime.

Therein lies my most challenging communications problem. While we all live in the same Cosmos as members of the same biological species, noologically we have developed quite different mindsets introjected from the cultures and subcultures we feel we belong too. So how are we all to develop a common understanding of our shared predicament and how to resolve it?

Well, these big questions of human existence have also preoccupied a group of cosmologists, mathematicians, and philosophers since Brandon Carter gave a lecture at the Royal Academy in 1983 on the implications of the anthropic principle to biological evolution, published in slightly different form, as I understand from comments of fellows who presumably attended the meeting. Carter began his talk with these words:

> The practical scientific utility of this principle arises from its almost tautological corollary to the effect that in making general inferences from what we observe in the Universe, we must allow for the fact that our observations are inevitably biased by selection effects arising from the restriction that our situation should satisfy the conditions that are necessary a priori, for our existence.[622]

He therefore suggested that the term *self-selection principle* would be a more appropriate alternative, for the principle "would be applicable by any extraterrestrial civilization that may exist". Nick Bostrom, in his rigorous attempts to bring conceptual clarity to the confusions surrounding the anthropic principle also suggests, "maybe *the psychocentric principle*, *the cognizability principle*, or *the observer self-selection principle* would have been better".[623]

Carter then plunged headlong into the murky waters of probability theory in mathematics, introduced on page 97 in connection with Shannon's stochastic, but meaningless communications theory. Particu–larly questionable is Bayes' theorem, which presents serious difficulties when attempting to apply it to practical situations, as I discovered as an undergraduate. Although probability theory is closely related to deductive logic, as George Boole pointed out in 1854, for myself, it is one of the least satisfying branches of pure mathematics, for it does not lead me to Wholeness and the Truth, to the complete unification of mysticism and science, which has been the central theme of my life since 1949. Nevertheless, probability has become a key element in scientific abductive reasoning for testing hypotheses, as mentioned on page 48. It is being applied in virtually every field of human endeavour today, from quantum physics, through actuarial calculations, to the global casino called capitalism.

Weighing the probabilities

There are two basic ways of assessing probabilities: through mathematical formulae and as an empirical science, whose origins can be traced back to antiquity. In this respect, "The subject had its twin roots in two fairly distinct lines of investigation: the solution of wagering problems connected with games of chance, and the processing of statistical data for such matters as insurance rates and mortality tables."[624]

Therein lies the central problem with probability theory. In games of chance, such as throwing dice or drawing a card from a 52-card pack, *a priori* probabilities are known, whereas in many practical applications they are not. So what mathematicians sometimes do is hazard a guess at the prior probabilities of various hypotheses based on experience and statistical analysis in order to calculate *a posteriori* probabilities. But we are now living at unprecedented times as evolution passes through its Accumulation Point, the most momentous turning point in its history. So, as John Petersen points out on page 132, "there are no direction-pointing precedents for what is coming."

In terms of mortality, we can use our intuitive sense of wholeness to assess the prior probabilities of when the deaths of the patriarchal epoch, capitalism and communism, and *Homo sapiens sapiens* will occur. In this respect, it is vitally important not to confuse the death of our biological species with the death of Western civilization. They are quite distinct, as the diagram of the crossover of civilizations on page 131 illustrates. For it is quite possible for the seven pillars of unwisdom to die within the psyche so that we can live happy and fulfilling lives at the end of time, knowing that none of us is ever separate from any other being for an instant.

In the event, it was to solve people's gambling problems rather than solving life insurance problems that led to mathematical probability theory. First, about 1550, Gerolamo Cardano, a Renaissance professor of mathematics and medicine and a compulsive gambler, wrote *Liber de Ludo Aleae* (*Book on Games of Chance*) as an aid to his fellow gamblers, although it was not actually published until 1663, having been found in his papers after his death. In this guide, Cardano gave a rough definition of probability as the sum of favourable outcomes divided by the totality of possible outcomes of an event.[625] He also described some ways to cheat. For instance, he said, "the chance of obtaining a particular card when cutting a deck is considerably increased by rubbing the card with soap."![626]

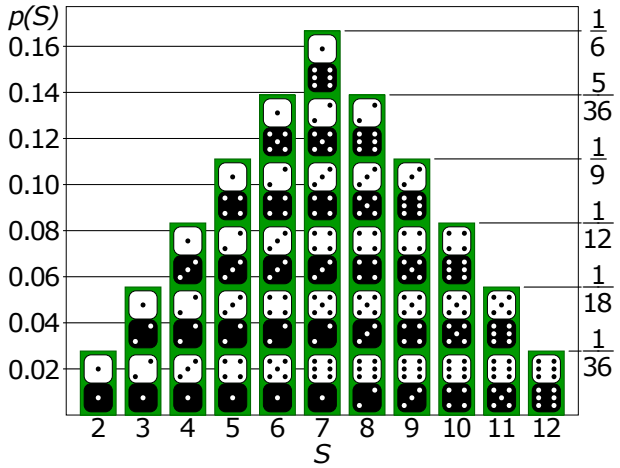
Then in 1654, Antoine Gombaud, a French writer and another inveterate gambler, also known as Chevalier de Méré, asked his friend Blaise Pascal to solve another gambling problem that concerned him: what is the proper division of a gambling stake in a game interrupted before the close. For instance, "Suppose two players, *A* and *B*, are playing a three-point game, each having wagered 32 pistoles, and are interrupted after *A* has two points and *B* has one. How much should each receive?" To solve this problem, known as the problem of points or the problem of division of the stakes, Pascal began a correspondence with Pierre de Fermat, both solving the problem in different ways, but coming up with the same answer: *A* and *B* should receive 48 and 16 pistoles, respectively.[627]

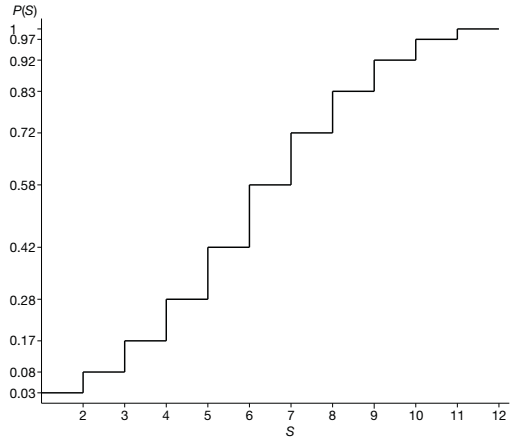
"Although neither Pascal nor Fermat wrote up their results, Christiaan Huygens in 1657 published a little tract, *De ratiociniis in ludo aleae* (*On Reasoning in Games of Dice*), that was prompted by the correspondence of the Frenchmen."[628] It was thus to answer this inconsequential gambling question, that the entire subject of probability has arisen.[629]

There is no need to go further into the tortuous history of probability theory, for we are principally concerned with understanding how scientists and philosophers use this theory to assess the longevity of our species. Not that this is easy. For instance, Nick Bostrom writes that the subject is "extremely difficult", but "a lot of intellectual fun".[630] Faced with such a complex situation, my normal approach is to

seek the simple patterns that underlie the complexity of the world we live in. So let us see how this helps us to understand the human predicament.

Returning to the gambling origins of probability theory, the left-hand diagram below, borrowed from Wikipedia, shows the frequency of all possible outcomes of throwing a pair of dice, with the probabilities listed on the left, in the manner that Cardano or Fermat would have calculated them. The diagram also illustrates another fundamental concept of probability theory, that of expectation, which Pascal introduced to solve the problem of points. The expectation is the weighted average of the possible outcomes, which is 7, also called the mean of the distribution of values.





The diagram on the right, on the other hand, illustrates the cumulative probabilities of outcomes less than a specific one. It can thus be used to calculate the probability of an outcome between two values, such as 8 and 6, inclusive, which is 16/36 or 4/9, about 44.4%.

This pair of complementary diagrams is a special case of a general principle that underlies probability theory, in conformity with the Cosmic Equation. The diagram on the right depicts what is called a cumulative distribution function (CDF). On the other hand, the left-hand diagram has two names. In this case, it is an example of a discrete distribution of a random variable, in which the variable is concentrated in certain isolated points, called a probability mass function (PMF). Its complement is a continuous distribution, where values form an unbroken whole, when it is called a probability density function (PDF).

The most familiar case of a probability density function is the normal or Gaussian distribution, with its characteristic bell shape, such as the distribution of the heights of adult women and men. We can also see this shape in the probability mass function for the frequency distribution of throwing a pair of dice. The cumulative distribution function in this example also displays the characteristic S-shape of the growth curve. It begins slowly, then speeds up, and then slows at the end.

We have now entered the element of time into the cumulative distribution function, for evolution, either as the growth of the complexity of structure or the numerical growth of population, builds on what already exists in an accumulative fashion. Most significantly, Verhulst's logistic curve, which arose from attempting to make predictions about the growth of the population of Belgium, is an example of a cumulative distribution function in probability theory.

But what goes up must come down. In terms of human population, schematically the S-shape of the cumulative distribution function has an enantiomorph, depicting the decline of human population towards zero, resulting in the bell shape of a probability density function. So what is going to happen to

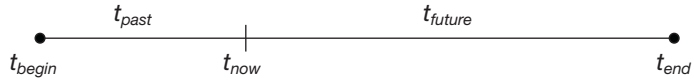
the S-shape of the growth of human population in the years to come, as it reaches its maximum and the number of people begins to diminish? What is our position in time in the logistic distribution function?

◇

Well, following Brandon Carter's basic statement of the problem in 1983, two people initially took up the challenge to calculate when *Homo sapiens* is most likely to become extinct: J. Richard Gott III, an astrophysicist, and John Leslie, a philosopher.

First, Gott described what he called the 'delta *t* argument' in a paper in *Nature* in 1993 called 'The Implications of the Copernican Principle for our Future Prospects'[631] and in an article titled 'The Grim Reckoning' in the *New Scientist* in 1997.[632] He tells us in the article that he got the idea when visiting the Berlin wall in 1969. At the time, it was eight years old and he wondered how much longer it would stand. At the time, he had just graduated from Harvard and reasoned that if it were a quarter or three-quarters of the way through its life, it would last either three times or a third as long. So he calculated with 50% confidence that the wall would come down within 2⅔ and 24 years. In the event, the Berlin Wall was demolished in 1989, 20 years later, within the range of his prediction.

Gott then realized that such a prediction could be used in a wide variety of other situations, such as the duration of Broadway plays or the lifespan of *Homo sapiens*, with the principal assumption being that the time of observation is not special in the overall course of the total lifespan of what is being observed. The basic reasoning is illustrated in this simple diagram, where the line represents the lifespan of a structure, from birth to death:



Now if t_{now} can lie equally anywhere in the range t_{begin} to t_{end}, then we can regard r as a random number uniformly distributed between 0 and 1, where:

$$r = \frac{t_{now} - t_{begin}}{t_{end} - t_{begin}} = \frac{t_{past}}{t_{lifespan}}$$

Then there is a probability p = 0.95 (using the more standard scientific criterion that predictions should have at least a 95% chance of being correct) that 0.025 < r < 0.975. In other symbols:

$$\frac{1}{39} < \frac{t_{future}}{t_{past}} < 39$$

Now if we assume that t_{past} is 200,000 years for the human race, then Gott predicted with 95% confidence that *Homo sapiens* would become extinct between 5,100 and 7,800,000 years in the future, giving our species a total longevity between 205,100 and 8 million years. Of course, this estimate is pretty crude, based on the assumption that r is uniformly distributed between t_{begin} and t_{end}, like the throw of a single die, where all outcomes are equally probable. But this is to ignore any additional information that we might have, such as the logistic probability distribution function, which better characterizes growth and decay processes. As Nick Bostrom points out, "A crucial flaw in Gott's argument is that it fails to take into account our empirical prior probability of the hypotheses under consideration."[633]

In *The End of the World* in 1996, John Leslie introduced the 'Doomsday argument', a term given him by Frank Tipler, who had introduced him to Brandon Carter's anthropic principle. Inspired by Carter's reference to Bayes' theorem in his 1983 lecture, Leslie set out to use this basic formula in probability theory to calculate the relative probabilities of what he called 'Doom Soon', within a few generations, and 'Doom Deferred', to many hundreds or thousands of generations into the future. [634]

Mathematically, Bayes' formula is very simple, involving just basic arithmetic, but very difficult to interpret, because of the assumptions on which it is based in practical situations. The theorem is named after Thomas Bayes, a Presbyterian minister and amateur scientist of sufficient merit to be elected fellow of the Royal Society in 1742. However, his eponymous theorem was not published in his lifetime. His friend Richard Price found Bayes' reasoning in his papers after he died and asked the Royal Society to publish the piece in 1763 as 'An Essay towards solving a Problem in the Doctrine of Chances'.

For myself, I learned Bayes' theorem as a nineteen-year-old in a course on statistics, having failed my economics examination in my first year at university because the concept of money made no sense to me. It was not regarded as especially significant because of the difficulties in applying it in practice. Indeed, Bayes is not mentioned in three of my books on the history of mathematics and is only mentioned in passing in a fourth. Rather, as I have recently discovered, Bayes' theorem is being used within scientific method, to test the validity of hypotheses in a wide variety of situations, such as medical diagnosis and social policy. So I have felt the need to revisit Bayes to see what all this is about.

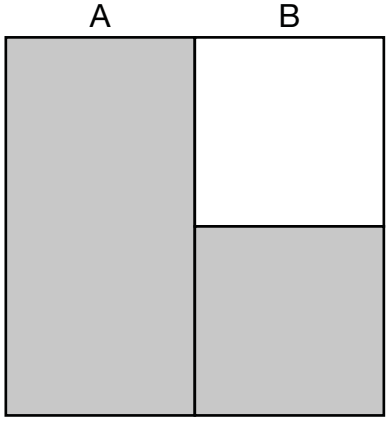
At the heart of Bayes' rule is the notion of conditional probability, which is very easy to explain. For instance, if you draw a card from a standard 52-card pack, then the probability of drawing a heart is 13/52, which we call $P(A)$. Then the probability of drawing a second heart is 12/51, which is expressed as the probability of B given A, denoted by $P(B|A)$. The probability of drawing two hearts simultaneously is thus 13/52 × 12/51 or 1/17. In algebra:

$$P(AB) = P(A) \times P(B|A) = P(B) \times P(A|B)$$

As we could denote the first and second drawings by B and A, A and B are symmetrical in this formula, known as the *multiplication rule* in probability theory.[635] It thus follows that

$$P(A|B) = \frac{P(A)P(B|A)}{P(B)}$$

This is Bayes' theorem in its simplest formulation. But what does it mean? Well, a video I found on YouTube helps to explain the meaning of the formula. There, an anonymous mathematician is teaching two of his sons, aged ten and nine, how to apply Bayes theorem.[636] Suppose you have two beakers A and B with 20 red gumballs in A and 10 red and 10 white gumballs in B. Then this situation can be depicted in this simple illustration, where the shaded area denotes red gumballs.



Then the probabilities of drawing a gumball from A or B are equally likely. In this case $P(A) = P(B) = ½$. These are called the *a priori* probabilities, prior probabilities, or priors. Suppose now you draw a red gumball, which we can call event R. What is the probability that it comes from beaker A? Well, there are 30 gumballs in total, of which 20 are in A. So we can see immediately that the probability that the gumball has come from A is ⅔. This is $P(A|R)$, called the *a posteriori* probability, determined directly from the diagram.

In other words, having drawn a red gumball, this increases our confidence that it has been drawn from beaker A from 50% to 66.7% and decreased our confidence that it has come from B to 33.3%. Conversely, if we had drawn a white gumball, we would know with a probability of 1 or 100% that it had come from B, for there are no white gumballs in A.

This is where Bayes' theorem moves from pure mathematics to scientific method. What we are doing is testing a hypothesis (H) given some evidence (E). So a clearer way of writing Bayes' theorem is this formula:

$$P(H|E) = \frac{P(H)P(E|H)}{P(E)}$$

But now things get a little more complicated. An event could test the prior probabilities of a number of mutually exclusive hypotheses, such as a gumball is drawn from beakers A or B. We could also have a number of mutually exclusive events, such as the drawn gumball is red or white. To keep things as simple as possible, suppose there are just two hypotheses H and not-H, denoted by H' (H-prime), and just two events E and not-E, denoted by E'. In this case, we need to apply Bayes' theorem to four different situations, giving $P(H|E)$, $P(H'|E)$, $P(H|E')$, and $P(H'|E')$, using a slightly more complicated version of Bayes' formula, for we need to calculate the prior probability of E given two hypotheses H and H', determined by this formula:

$$P(E) = P(H)P(E|H) + P(H')P(E|H')$$

This formula might look a little cumbersome, but we can easily illustrate its meaning with the gumballs example. For instance, the probability of drawing a red gumball from either of the two beakers, called the universe of discourse in logic and statistics, is the sum of the probabilities of drawing a red gumball from A and B. This is ½ · 1 + ½ · ½, which is ¾, which we can see immediately from the diagram. For there are 40 gumballs in total, of which 30 are red.

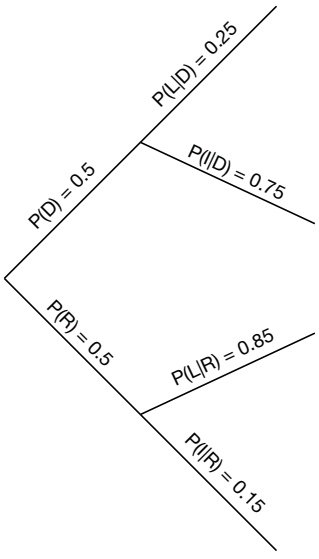
So Bayes' rule then becomes:

$$P(H|E) = \frac{P(H)P(E|H)}{P(H)P(E|H) + P(H')P(E|H')}$$

Applying this formula in the gumballs example, the probability that a gumball has been drawn from A given that it is red is ½ · 1 / ¾, which is ⅔, as we could see directly from the shaded area in the diagram.

In other words, the posterior probability of hypothesis H is affected by the probabilities of H'—in quite a dramatic way in the case of the two hypotheses Doom Soon and Doom Deferred, as Leslie explains. To understand what this means, it is best to use a tree diagram, as several YouTube videos on the Web do. For instance, let us borrow an example that mezzo-soprano Dana Scheider uses to explain Bayes' rule in a video titled 'Bayes' Theorem—Explained Like You're Five'.[637]

Suppose, for instance, that there is an election in the USA and that the Democrats and Republicans have an equal probability of winning, so that the prior probabilities of $P(D)$ and $P(R)$ are 50%. Suppose too that political pundits have estimated that the conditional probabilities of business taxes being lowered or increased are 25% or 75% if Democrats are elected and 85% and 15% if Republicans are. Then we can represent these probabilities in a tree diagram, illustrated here.



Then one day after an election, the President announces that taxes are to be lowered or increased, although, as I understand the situation, it is Congress that sets taxes in practice should the President and Congress be different parties, as in 2015. Be this as it may, if taxes are changed, what are the probabilities that the President is a Democrat or Republican in these four situations? Well, we can read the numerators to be used in Bayes' formula directly from the tree diagram.

The numerators are the products of the probabilities on the four branches, given in the table below. And the probabilities of taxes being lowered or increased are the sum of the first and third and second and fourth numerator terms, 55% and 45%, respectively. These numbers are the denominators in the formula. It is then a simple matter of calculating the posterior probabilities of Democrats or Republicans being elected given that taxes were lowered or increased.

Bayes	Numerator	Denominator	Num/Denom
$P(D\|L)$	0.125	0.55	0.227
$P(D\|I)$	0.375	0.45	0.833
$P(R\|L)$	0.425	0.55	0.773
$P(R\|I)$	0.075	0.45	0.167

In other words, if taxes are lowered, the hypothesis that Democrats or Republicans have been elected is changed from 50% to 23% and 77%, respectively. Similarly, if taxes are increased, the hypothesis that Democrats or Republicans have been elected is changed from 50% to 83% and 17%, respectively. These changes are sometimes called Bayesian shifts.

If we now wish to estimate the relative probabilities of the human race becoming extinct within the next century or two or within many thousands of years, we need to personalize the reasoning. Leslie begins his argument by imagining a scene from the late twenty-first century, when there are twelve billion humans living on Earth, all of whom are about to die for some reason, from germ warfare, for instance. Given this scenario, "One of the doomed humans complains of his remarkable bad luck in being born so late. 'There have been upward of fifteen thousand generations since the start of human history—yet here I am, in the one and only generation which will have no successors!' "[638]

To illustrate how this vision can be expressed in terms of Bayes' theorem, Leslie begins with a simple example. Suppose that there is a 98% probability that a lottery urn with his name on it contains one thousand names and a 2% probability that it contains just ten. These are the prior probabilities for the two hypotheses. Then Leslie asks, "What if I next find that mine is among the first three names drawn from the urn?" Then a similar Bayesian calculation that the urn that has been drawn from is the one with ten names in it has increased from 2% to about 67%, a massive Bayesian shift.

So how can we apply this reasoning to the Doomsday argument? Well, none of us likes the idea of Doom Soon, that the human race will become extinct by 2150, let us say. We much prefer Doom Delayed by at least a few centuries. Accordingly, Leslie gives the prior probabilities of these two hypotheses as 1% and 99%, respectively.

He then asks where we are in time, not unlike Gott with his delta *t* argument. Today, there are about seven billion people living on Earth, quite a high proportion of all the humans who have ever lived because of the extremely slow increase in human population until the industrial revolution less than three hundred years ago. So if humanity were to become extinct by 2150, maybe people living then would be *one in ten* of all those who had ever lived. On the other hand, in the case of a long-lasting race, people living at that time could be *one in a thousand* of those who had ever lived.

Plugging these figures into Bayes' rule, the prior probability that humanity will become extinct within the next few generations increases from one per cent to a little over fifty per cent. Leslie then considers an alternative second scenario. Suppose the human race survived beyond 2150 and went on to colonize the galaxy, as Stephen Hawking has proposed on a number of occasions, then the probability *one in a thousand* could increase to *one in a million* of all those who had ever lived at the time of the extinction of *Homo sapiens*. In this case, given the two hypotheses under consideration, the conditional probability of

humanity becoming extinct by 2150 would increase to almost exactly 99.9%. For the less likely the extinction event given the second hypothesis, the greater the Bayesian shift of the prior probability of the first hypothesis.

Of course, this is just a numbers game, used to test people's beliefs about humanity's place in the overall scheme of thing. Nevertheless, these results indicate, "There are fairly strong grounds for thinking that the next one and a half centuries will be a period of grave danger," as Leslie points out.[639] Similarly, when reviewing the Doomsday argument in *Anthropic Bias*, Nick Bostrom wrote that it is a 'shocking claim' "to show that the life expectancy of the human species has been systematically overestimated."[640]

As mentioned on page 117, Bostrom has set up a portal on the Web on the anthropic principle, seeking ways to refute the 'notorious' Doomsday argument in both its forms—sooner or later. Nick writes, "I think that the Doomsday argument is inconclusive," for complicated reasons, but "It is therefore paramount that the Doomsday argument not be dismissed for the wrong reasons." As he says, his reasoning is complicated,[641] but let us see if we can simplify it a little, highlighting the pillars on which it is constructed.

The central issue is observation selection effects in science and philosophy, as the subtitle of his book indicates. These are a variation of a fundamental weakness in scientific method mentioned on page 44: observations intended to falsify a theory developed through induction could be distorted by the theories on which the observations are based; observation statements are theory dependent.

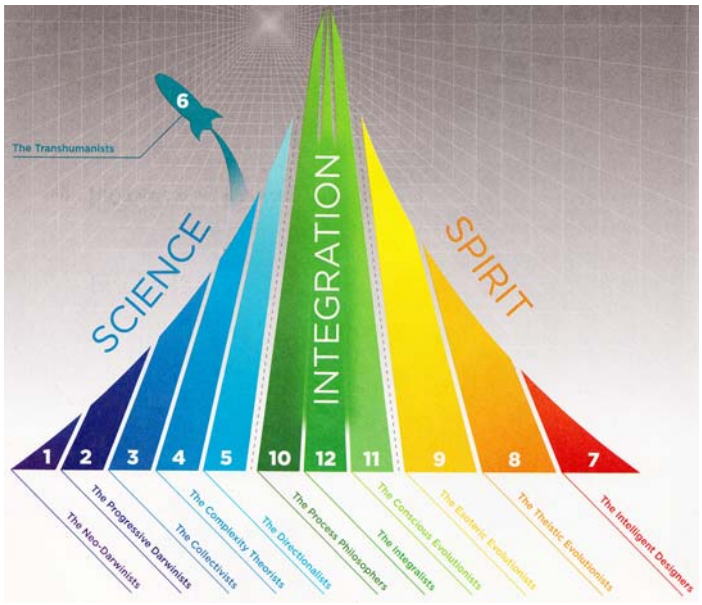
Bostrom provides another angle on this basic weakness in human reasoning, which he illustrates with a poll conducted by *Literary Digest* in 1936, attempting to forecast the result of the upcoming presidential election. To make its prediction, the *Literary Digest* extracted a list of names and addresses from telephone books and motor vehicle registries, effectively selecting better-off people, who were more likely to vote for Alf Landon, the Republican candidate, than the incumbent Franklin D. Roosevelt, who actually won by a large margin. Not surprisingly, as the *Literary Digest's* infamous poll was way off the mark, it suffered a major reputation loss and soon went out of business.[642]

The next major concept we need to consider is that of the population from which observers are selected, which Bostrom calls the 'reference class'. The ultimate reference class is the set of all beings, a generalization of the superclass **Object** in object-oriented modelling and programming methods in business, as described on page 50. In the case of the anthropic principle, observers are self-selected, as intelligent beings. Assuming that rocks do not have souls or minds, such beings are not in the reference class under consideration.[643]

We therefore need to ask, what exactly is an intelligent being? Well, what is generally meant by this term, from our Earth-bound perspective, is someone who is a member of *Homo sapiens sapiens* 'wise-wise human', as we have hubristically called ourselves. But this is biotic notion, not taking into account the way evolution has been unfolding during the past several thousand years in the Numinosphere and noosphere. As we have seen during the patriarchal epoch, *Homo sapiens* has become *Homo noeticus* and *Homo divinus unitas*, as people have followed evolutionary or involutionary journeys in life, culminating in fragmented minds or No-mind, respectively.

But now the patriarchal epoch is coming to an end as evolution and involution carry humanity into the eschatological Age of Light. *Homo noeticus* is becoming *Homo universalis*, which is becoming unified with *Homo divinus unitas* as *Homo divinus holoensis*. And those who are members of these awakening species are in a quite different reference class from *Homo noeticus*, often being called luminaries or visionaries. So

if they thought about the future of humanity in probabilistic terms, which few do, they would do so with quite different *a priori* probabilistic expectations.



However, where does the transhumanist movement, of which Nick Bostrom is a leading member, fit into this evolutionary model? Well, as this diagram from the *What is Enlightenment?* magazine indicates, the transhumanist movement is accelerating away from Reality with everyday that passes. This 2007 issue was focused on 'The Mystery of Evolution: A spiritual and scientific exploration of where we came from and where we're headed'. The editors of *WIE* did a brilliant job summarizing twelve different theories of evolution, stating the core idea of transhumanists thus: "Human beings must take control of their continued evolution—primarily through bioengineering, cybernetics, nanorobotics, and other technological means."

Most significantly, the transhumanist movement seems to believe that it is possible to use technology to defeat death in some form of posthuman creature—whether carbon- or silicon-based is uncertain. For instance, Max More, a co-founder of the movement, is President and CEO of the Alcor Life Extenstion Foundation, the 'world's leading cryonics organization'.

So Nick Bostrom's probabilistic reasoning is being conducted within a culture that is in denial, as Ernest Becker pointed out in *The Denial of Death*, which posthumously won the Pulitzer Prize for General Non-Fiction in 1974. Furthermore, this movement grossly distorts Julian Huxley's transhumanist vision of humans transcending their limitations by "destroying the ideas and the institutions that stand in the way of our realizing our possibilities", mentioned on page 5. Nevertheless, in 'A History of Transhumanist Thought', Nick does acknowledge that the idea for a technological singularity can trace its lineage to Teilhard's writings. But then he points out, "While these ideas might appeal to those who fancy a marriage between mysticism and science, they have not caught on either among transhumanists or the larger scientific community."[644]

I infer from this that some transhumanists could still evolve into *Homo divinus holoensis*, the unification of *Homo universalis*, at the peak of Western reason, and *Homo divinus unitas*, at the utmost depth of Eastern mysticism. So to open a dialogue between evolutionaries, who *are* attempting to realize Teilhard's vision, and the transhumanists, I still feel it is worthwhile to rescue some meaning from Nick's complex, inelegant reasoning, which is not based on either the Truth or Reality. But this must wait for another time, for we have far more urgent issues to deal with. Whether we like it or not, the days of Western civilization, the global economy, and *Homo sapiens sapiens* are numbered.

For instance, emphasizing the positive, Thea Alexander describes a world in her post-apocalyptic novel *2150 A.D.* where an awakened society is in the majority. In 2150, there are just 300 million people on Earth living in what she calls the 'Macro Society' living cooperatively in Wholeness, while another 3 million live on Micro Island, where people can "live selfishly and in fear of their fellow micro neighbours",[645] like society in the 1970s, when the book was written. Of course, this means that between

now and then, the human population on Earth will decrease rapidly. As Carol explains to Jon, travelling forward in time:

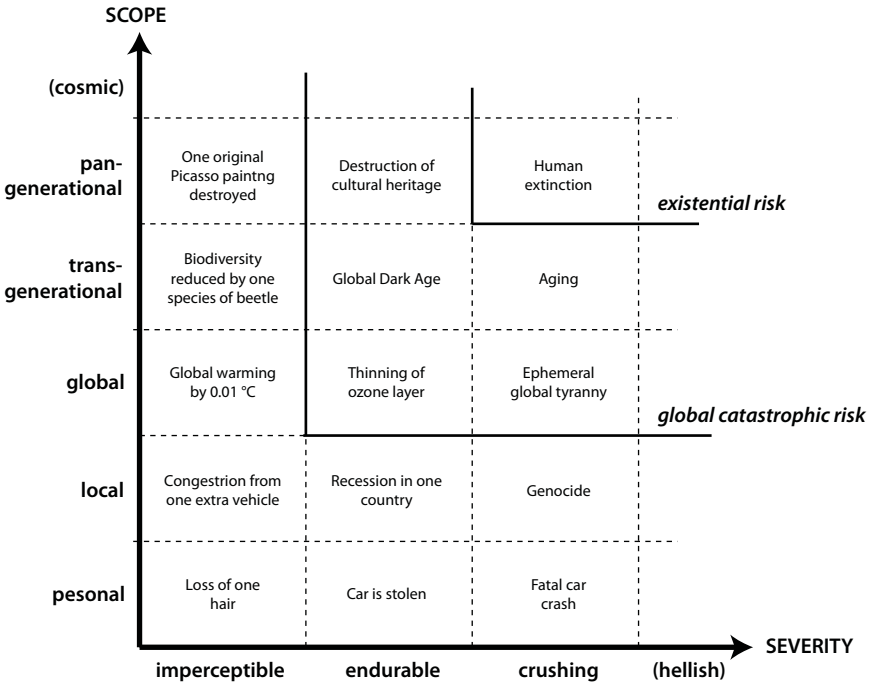
> There would have been have been a lot more, in spite of the physical disasters, if micro man could have at last cooperated and helped each other. Unfortunately, he accentuated all the traditional divisions—nationality, race, religion, language, educational and socioeconomic levels—and fought over the fast-dwindling resources of his ravaged planet.[646]

Looking even further ahead, Doris Lessing's *Mara and Dann*, written in 1999, is set many thousands of years in the future, towards the end of the next ice age, when the whole of Europe is covered in ice down to the Mediterranean. The only inhabitable land at these lines of longitude is Africa, called 'Ifrik' in the book. But this suffers from climate change, with parched lands and the occasional flash flood. The novel describes Mara and Dann's struggle to survive in these primitive, hostile conditions and of their journey from southern Africa to the north, where conditions are a little more amenable. Mara, who grows into womanhood from a pubescent girl on this adventure, is keen to learn about life in earlier times. But like so many people today, she struggled to grasp the exponential nature of time: "When Mara said hundreds, she meant a long time; and when thousands, it meant her mind had given up, confessed failure: thousands meant an unimaginable, endless past."[647]

Existential risks

Having reviewed the broad prospects for the future of humanity, it is now time to focus more on the practicalities, facing what Nick Bostrom calls 'existential risks', a subset of what he and his colleague Milan M. Ćirković, from the Astronomical Observatory of Belgrade, call global catastrophic risks in a book with this title. Bostrom defines 'existential risk' as "One that threatens the premature extinction of Earth-originating intelligent life or the permanent and drastic destruction of its potential for desirable future development",[648] while he and Ćirković define a global catastrophic risk as one "that might have the potential to inflict serious damage to human well-being on a global scale".[649]

Bostrom illustrated the relationships between these two types of risk in a TEDx talk titled 'The End of Humanity' in 2013,[650] a revision of a diagram that he and Ćirković presented in the book that they co-edited.[651]



Others who have written extensively about the possible threats to the health, well-being, and survival of our biological species are John Leslie and Richard A. Posner, a judge in the US Court of Appeals, who wrote in *Catastrophe* in 2004 that what he calls 'catastrophic risks' "are real and growing and that the social sciences, in particular economics, statistics, cognitive psychology, and law, have an essential role to play in the design of policies and institutions for combating them". Among these catastrophic risks, he includes natural catastrophes, such as pandemics and asteroids, scientific accidents, such as omnivorous nanomachines, genetically modified crops, and artificial intelligence, and other unintended man-made catastrophes, such as global warming and the exhaustion of natural resources.[652]

These are similar to the risks that Leslie identified in *The End of the World*, which lists seven major risks, which are well recognized: nuclear war, biological warfare, chemical warfare, destruction of the ozone layer, 'greenhouse effect', poisoning by pollution, and disease. He then goes on to describe further risks in two groups. Group 1 consists of natural disasters: volcanic eruptions, hits by asteroids and comets, an extreme ice age due to passage through an interstellar cloud, a nearby supernova, other massive astronomical explosions, essentially unpredictable breakdown of a complex system, and something-we-know-not-what. In group 2, potential man-made disasters, he includes: unwillingness to rear children, a disaster from genetic engineering, a disaster from nanotechnology, disasters associated with computers, some other disaster in a branch of technology, perhaps just agricultural, which has become crucial to human survival, production of a new big bang in the laboratory, the possibility of producing an all-destroying phase transition, annihilation by extraterrestrials, and again, something-we-know-not-what.[653]

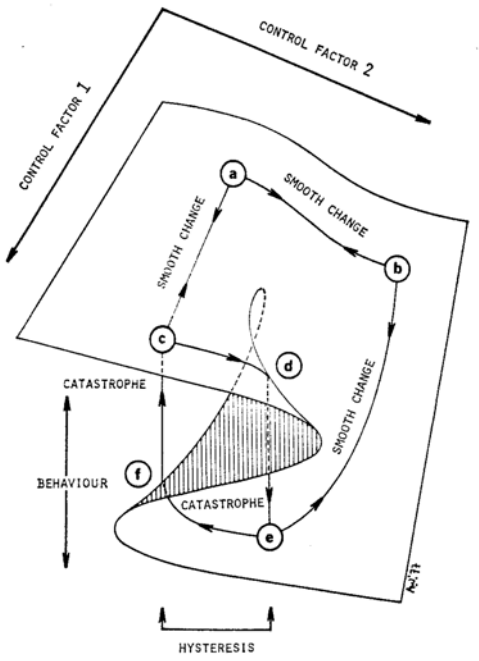
In *Our Final Century*, the astrophysicist Martin Rees writes that while science and technology have provided many of us with the most amazing creature comforts during the last century or two, "The 'downside' from twenty-first century technology could be graver and more intractable than the threat of nuclear devastation." For instance, he cites the potential dangers of nanotechnology, genetic engineering, artificial intelligence. [654]

To address these concerns, Rees is a cofounder with Huw Price, Bertrand Russell Professor of Philosophy at Cambridge University, and Jaan Tallinn, Co-founder of Skype, for the Centre for the Study of Existential Risk (CSER). CSER is an interdisciplinary research centre focused on the study of human extinction-level risks that may emerge from technological advances. They say, "We aim to combine key insights from the best minds across disciplines to tackle the greatest challenge of the coming century: safely harnessing our rapidly-developing technological power. … Our goal is to steer a small fraction of Cambridge's great intellectual resources, and of the reputation built on its past and present scientific pre-eminence, to the task of ensuring that our own species has a long-term future." [655]

To address the slightly less critical risks, Seth Baum and Tony Barrett founded the Global Catastrophic Risk Institute (GCRI) in 2011. GCRI is a nonprofit, nonpartisan think tank that analyses risks to the survival of human civilization. They say, "Our mission is to develop the best ways to confront humanity's gravest threats." GCRI is geographically decentralized, meaning that it has no central headquarters and its affiliates are located in many places.[656]

All this talk of impending catastrophe reminds me of René Thom's catastrophe theory in mathematics, which a British colleague, working at IBM's European headquarters in Paris, told me about in December 1979, when I visited him. At the time, I was beginning to see that the global economy contains the seeds of its own destruction within it and that, as a consequence, my children, born in 1970 and 1973, were not being educated to live in the world that would exist when they came to have children of their own.

When I subsequently resigned from IBM in May 1980 to investigate how they should have been educated, I thought that I would need catastrophe theory in the theory of everything that I then began to develop, just as Einstein needed to use tensor analysis and non-Euclidean geometry in the general theory of relativity. After all, the subtitle of Thom's book *Structural Stability and Morphogenesis* is *An Outline of a General Theory of Models*, which was exactly what I was working on. Thankfully, I eventually realized that such advanced mathematical tools were unnecessary. All I needed to unify the psychospiritual and physical energies at work in the Universe were the semantic modelling methods of information systems architects in business.



Nevertheless, there is still something we can learn from catastrophe theory. This diagram depicts the cusp catastrophe, where the path to and from *a* and *e* could either be smooth or sudden, a 'catastrophe'. As an example, I have read that climate change can either be gradual or unexpectedly rapid, when temperatures in the North Atlantic could change by five degrees in just a few years, for instance. Similarly, within the psyche, the way we learn can be steady and gradual or spontaneous, as in an aha! eureka moment. As Thomas A. Edison famously said, "Genius is one percent inspiration, ninety-nine percent perspiration."

Whether we like it or accept this or not, this is the world we live in, governed by the Principle of Unity: *Wholeness is the union of all opposites*. We cannot pick and choose between the various scenarios, for all are possible. Yes, just as our lifestyles can affect our health, well-being, and longevity as individuals, our collective lifestyles and value systems will affect how we all could live harmoniously together during the eschatological Age of Light.

What these perspectives show is that the human race may not become extinct in a single cataclysmic event, such as an asteroid hitting the Earth, which NASA has said is unlikely in the foreseeable future. Rather, as the bell shape of the logistic distribution curve depicts, the human population could possibly diminish steadily in the years to come after it reaches its peak. Why this might happen and how humans will deal with this situation psychospiritually and practically is very much dependent on the extent to which evolution can become fully conscious of itself within humanity, helping people to wake up, transforming our mindsets, free of delusion.

For today, the greatest threat to the health and well-being of our species is not outside us. Rather, the greatest dangers we face lie within us as fear and ignorance, generating a pandemic of existential fear from the existential risks we face today. So while it is important to address what the Arlington Institute calls the World's Biggest Problems of Economic Collapse, Peak Oil, Global Water Crisis, Species Extinction, and Rapid Climate Change, if it is fear that drives our activities in these areas, then we are not going to the root of the problem facing humanity today. Furthermore, such fears inhibit the realization of our fullest potential as a species, also preventing us from intelligently dealing with the challenges that we face with as much consciousness as we can muster.

What this means is that we urgently need to address the three boxes bordering the existential-risk box in Nick Bostrom's diagram on page 149: 'Destruction of cultural heritage', 'Global Dark Age', and 'Aging'. For today, materialistic, mechanistic science and either-or mathematical logic have driven Western

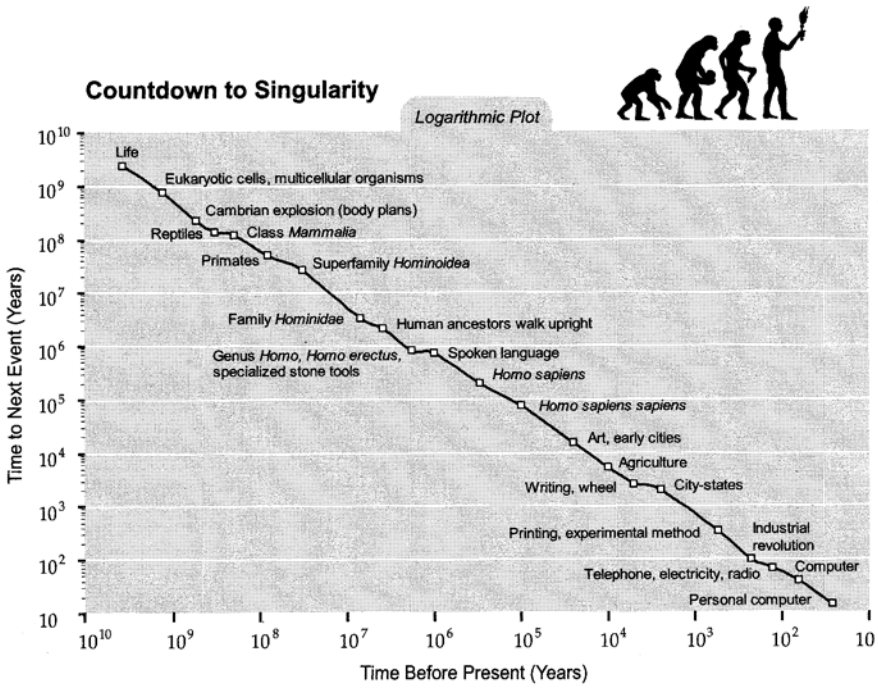
civilization into a global dark age. As our cultural heritage, this predominant civilization has come to the end of its useful life in old age. So the only option open to us is to destroy the seven pillars of unwisdom on which the education, health, and economic systems are built in order to rebuild the entire world of learning on the seven pillars of wisdom. Nothing less will ensure the survival of humanity in some form until the end of this century, at least.

But how is this to come about? Well, Arnold Toynbee showed in *A Study of History* that new civilizations emerge when a minority breaks away from earlier civilizations to seek quite new ways of living and learning, often based on somewhat different spiritual premises and beliefs. As we have seen, speciation acts in a similar fashion. Conversely, civilizations and species die when they no longer adapt to their changing environment.

So who are the pioneers today seeking to take humanity in a quite new direction, aiming to transcend our cultural limitations in what Julian Huxley called transhumanism? Well, as I see the situation, they form two distinct groups, the transhumanists and evolutionaries, with quite different perspectives on the relationships of humans to technology and hence to the Divine and the Universe. So let us look at both of these in turn to see how their activities could be integrated in the Alliance for Mystical Pragmatics.

Evolutionary pioneers

At the heart of the transhumanist movement is Ray Kurzweil's diagram of the exponential rate of evolutionary change, presented in his book *The Singularity is Near*, published in 2006, reproduced below. This is clearly similar to Nick Hoggard's diagram of major evolutionary turning points on page 128, viewing the evolutionary turning points following biogenesis as technological evolution. Of course, these technological innovations in our external world are actually manifestations of mental evolution in the noosphere, which is how I have been viewing them since I discovered Nick's evolutionary model in 2000. For twenty years earlier I had begun to investigate whether computers, working independently of humans, could do the job of an information systems architect, which includes the task of cognitively modelling the business modelling process.



But I see little sign that transhumanists see the relationship of humans to computers in this manner. Rather, several organizations have appeared in recent years engaged in technological utopianism defined as "any ideology based on the premise that advances in science and technology will eventually bring about a utopia, or at least help to fulfil one or another utopian ideal".

For instance, in 2000, Eliezer Yudkowsky, who coined the term 'friendly AI', and Brian and Sabine Atkins founded the Singularity Institute for Artificial Intelligence, which later became the Singularity Institute and then the Machine Intelligence Research Institute (MIRI), whose purpose is to do "foundational mathematical research to ensure that smarter-than-human artificial intelligence has a positive impact".[657] Then in 2008, Kurzweil founded the Singularity University with Peter Diamandis and Salim Ismail in NASA Research Park in California, saying, "Our mission is to educate, inspire and empower leaders to apply exponential technologies to address humanity's grand challenges."

Another with a similar view was James Martin, who donated sixty million pounds to the University of Oxford in 2005, to put his technological vision of the future into practice, outlined in *The Wired Society*, which was nominated for a Pulitzer Prize in 1977. The James Martin 21st Century School, founded with the largest benefaction in the university's history, then became the Oxford Martin School. The Future of Humanity Institute, "a leading research centre looking at big-picture questions for human civilization", is a constituent of the Oxford Martin School, directed by Nick Bostrom.

In 1998, Bostrom also co-founded the World Transhumanist Association with David Pearce, in contrast to the techno-utopianism of the Extropy Institute, founded by Max More in 1987. According to Wikipedia, "WTA officials considered that social forces could undermine their futurist visions and needed to be addressed. A particular concern is the equal access to human enhancement technologies across classes and borders." In order to project a more humane image, the WTA changed its name to 'Humanity+' in 2008 as part of a rebranding effort, with this logo and motto 'Don't limit your challenges. Challenge your limits'.

Its website states, "Humanity+ is an international nonprofit membership organization that advocates the ethical use of technology to expand human capacities. In other words, we want people to be better than well." Its mission is defined thus:

> **Humanity+** is dedicated to elevating the human condition. We aim to deeply influence a new generation of thinkers who dare to envision humanity's next steps. Our programs combine unique insights into the developments of emerging and speculative technologies that focus on the well-being of our species and the changes that we are and will be facing. Our programs are designed to produce outcomes that can be helpful to individuals and institutions.

All this sounds really fine, for who does not want to improve the human condition? However, the transhumanist movement is a very far remove from Julian Huxley's vision of humanity living in 'mystical ecstasy', inspired by his conversations with Pierre Teilhard de Chardin. Indeed, Natasha Vita-More, chair of the board of directors of Humanity+, has distanced herself from Huxley's philosophy of transhumanism, as she indicates in an essay in *The Transhumanist Reader*, edited by Max More and herself.[658]

But such an approach does not enable us to unify science and spirit. As we see in the diagram on page 148, eight years ago, the *WIE* editors regarded the Integralists, led by Ken Wilber, as the group most likely to realize this unification, their core idea being "Evolution is a holistic process that includes both objective and subjective dimensions of reality as it moves toward greater exterior complexity of form and greater interior depth of consciousness." Let us therefore look at the prospects for humanity if we follow their lead.

Recognizing that humans are the leading edge of evolution, not computers, for the last thirty years, I have naturally been following the evolutionaries more than the transhumanists, not realizing until recently what a powerful influence this latter group is having on policy makers. For it is only when people become increasingly aware of how evolution is becoming conscious of itself in their own direct experience that we have any hope of transcending our mechanistic cultural and personal conditioning. These awakening experiences have led to a new word: *evolutionary*, to denote such phylogenetic ontogenies.

In *Evolutionaries*, Carter Phipps writes "*Evolutionist* is defined in dictionaries as a person who is an 'adherent to the theory of evolution'. … It is a term often contrasted with *creationist*." He then goes on to write, "Evolutionary is a play on the word *revolutionary*, and I mean it to convey something of the revolutionary nature of evolution as an idea. Evolutionaries *are* revolutionaries." Carter then gives three critical characteristics common to evolutionaries:

1. Evolutionaries are cross-disciplinary generalists.
2. Evolutionaries are developing the capacity to cognize the vast time scales of evolutionary history.
3. Evolutionaries embody a new spirit of optimism.[659]

Another characteristic that distinguishes evolutionaries from evolutionists is that the former recognize that evolution is taking place within them in the noosphere. This leads us to Barbara Marx Hubbard's notion of conscious evolution, mentioned on page 134, and the evolutionary leaders rallying to 'A Call to Conscious Evolution: Our Moment of Choice'. Originally this was signed by forty-seven visionaries, thirty-eight gathering for this inaugural photo. Subsequently, ten dropped out and twenty were added, giving fifty-seven profiled on the website, seeking to accelerate the shift in consciousness together.

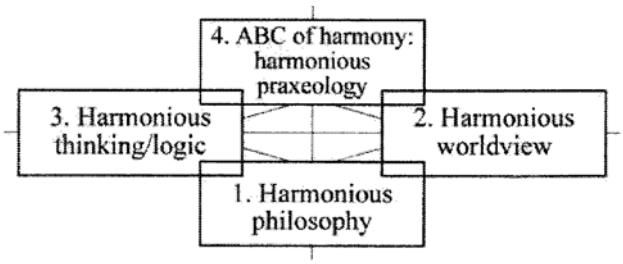
However, inspiring as this leading group is, for evolution to become fully conscious of itself within us human beings requires us to be conscious of how we form concepts and organize our ideas in tables and mathematical graphs or semantic networks. Even the concept of set, which is key to such an understanding of ourselves, is not familiar to those who did not study the new maths in primary schools in the 1960s.

One leading evolutionary not included in this group is Ken Wilber, who, in 2014 and 2015, ran ten-week teleseminar courses titled 'Superhuman Operating System', with the purpose, "Install a Revolutionary New Operating System for Your Mind to Illuminate the Full Spectrum of Your Human Potential, and Become the Greatest Possible Version of Yourself." Just as I have been doing for most of my adult life in the information technology industry, Ken likens our minds to the software in computers. As he points out, just as software determines how computers function, our minds, not our brains, control our learning and behaviour and hence our happiness.

However, it is not actually possible for an external teacher to install a Superhuman Operating System within us. If evolution is to carry us as a species to its Omega Point, such a radical transformation of consciousness can only come from within. Furthermore, Ken's AQAL model does not include itself within its own creation. So it does not fully map the Cosmic Psyche with Self-reflective Intelligence.

Ken's tetradic model is not the only such model seeking to heal the splits between the opposites. Jung, not being satisfied the Christian trinity, regarded the concept of quaternity as a fundamental archetype, influenced by Buddhist mandalas and corresponding alchemical structures. However, this is not widely accepted in religious circles, for as he said, in Christianity, "The idea of a quaternity of divine principles was violently attacked by the Church Fathers when an attempt was made to add a fourth—God's 'essence'—to the Three Persons of the Trinity."[660]

Another who uses quaternity as an underlying unifying principle is Leo Semashko, Founder and President of the Global Harmony Association (GHA). In *The ABC of Harmony*, Semashko lists eighty-eight 'tetranets' related to the contributions of seventy-six authors from twenty-six countries. This is the first one in the book, illustrating "The unity of the abilities of harmonious mind". However, this tetranet, like the others, does not unify pairs of opposites in the Cross of Duality, defined on page 16. Rather, there does not seem to be a generalizing pattern that unifies these elements in a meaningful semantic manner.

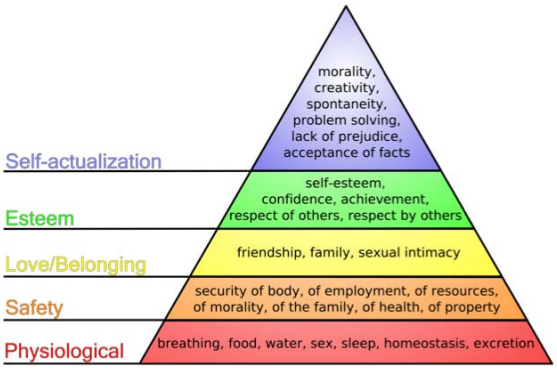


Nevertheless, the GHA has twin mottos 'Peace Comes from Harmony through Science' and 'Harmony Gives Happiness', as this logo depicts. Yes, indeed. When we allow Heraclitus' Hidden Harmony to guide our lives, overcoming the divisiveness of Aristotle's Law of Contradiction, there is no need ever to be unhappy.

So what all these developments are telling us is that evolution is currently healing the split between Eastern mysticism and Western science, which opened up about five thousand years at the dawn of recorded history and the birth of the first major civilizations in the patriarchal epoch.

The Jonah syndrome

However, rebuilding society on the seven pillars of wisdom is still quite a challenge. For there is intense resistance in society today to enjoying the delights of *Homo divinus holoensis* or even *Homo divinus unitas*, living in *Heaven*, originally perceived as where the gods live, called *Nirvana* 'extinction' or *Moksha* 'liberation' in the East. Few have yet climbed to the summit of Abraham Maslow's hierarchy of needs,[661] which I learned about in 1974, when attending management education classes in IBM. For we have a tendency to follow the crowd, prioritizing our needs for self-esteem, belonging to exclusive groups of 'like-minded' people. Like Paulo Coelho, we still need the courage to be different, despite many teachings and books advising us to follow our own inner energies, disregarding what people in the world outside might think.



We can see why we hesitate to reach out to our fullest potential as a superintelligent, superconscious species from Maslow's notion of 'Jonah Syndrome'.[662] Andrew Gibb, a postgraduate student of Basil Hiley in David Bohm's department in Birkbeck College, London, introduced me to this pandemic, psychological disorder in 1984, after I met him at the Teilhard Centre in the city. For Andrew could see that I was afraid of my own power, of the irrepressible creative energies pouring through me at superhyperexponential rates of acceleration. To deal with this predicament, Andrew introduced me to Life Training, an exhilarating, but challenging group psychotherapeutic practice, which Brad Brown and Roy Whitton had founded in the USA, now called 'More to Life'.[663]

So I have had more than thirty years of personal experience learning how to conquer the Jonah Syndrome, a term suggested by Maslow's friend Frank E. Manuel, the author of a psychological biography of Isaac Newton[664] and with his wife Fritzie of a monumental history of Utopian thought.[665] This term was changed to 'Jonah Complex' in Chapter 2 of Maslow's posthumous book, *The Farther Reaches of Human Nature*, the chapter on 'Neurosis as a Failure of Personal Growth'. However, as I prefer Maslow's original term, that is what I use in this dissertation.

Jonah's hesitation to speak "the word of the Lord" against the wickedness of Nineveh was symbolized by his being eaten by "a great fish" before he eventually went there to fulfil his destiny. Using this allegory, Maslow began his article with these words:

> All of us have an impulse to improve ourselves, an impulse toward actualizing more of our potentialities, toward self-actualization, or full humanness, or human fulfillment, or whatever term you like. Granted this for everybody, then what holds us up? What blocks us? … In my own notes I had at first labeled this defense the "fear of one's own greatness" or the "evasion of one's destiny" or the "running away from one's own best talents."[666]

He then goes on to say:

> We fear our highest possibilities (as well as our lowest ones). We are generally afraid to become that which we can glimpse in our most perfect moment, under the most perfect conditions, under conditions of greatest courage. We enjoy and even thrill to the godlike possibilities we see in ourselves in such peak moments. And yet we simultaneously shiver with weakness, awe, and fear before these very same possibilities.[667]

These limiting fears can arise both within us as individuals and within the society in which they occur. First, examining why peak experiences are most often transient, Maslow writes:

> *We are just not strong enough to endure more!* It is just too shaking and wearing. So often people in such ecstatic moments say, 'It's too much,' or 'I can't stand it,' or 'I could die.' … Yes, they *could* die. Delirious happiness cannot be borne for long. Our organisms are just too weak for any large doses of greatness. … Does this not help us to understand our Jonah syndrome? It is partly a justified fear of being torn apart, of losing control, of being shattered and disintegrated, even of being killed by the experience.[668]

So sometimes when we let loose the unlimited potential energy of Consciousness, the effect can be overwhelming, leading to what Christina and Stanislav Grof call a spiritual emergency,[669] when Spirit emerges faster than the organism can handle. We can even fear success, even fear God, in whatever way we view Ultimate Reality, ranging from Buddhist Emptiness (*Shunyata*) to the Supreme Being of the Christians. As Ernest Becker writes in *The Denial of Death*, "It all boils down to a simple lack of strength to bear the superlative, to open oneself to the totality of experience."[670]

It was not only the writers of the Old Testament who were aware of the Jonah syndrome. Arjuna had a similar experience, recorded in the *Bhagavad Gita*. When Krishna showed him the Ultimate Cosmic Vision—"all the manifold forms of the universe united as one"—Arjuna said, "I rejoice in seeing you as you have never been seen before, yet I am filled with fear by this vision of you as the abode of the universe."[671]

Elaine Pagels makes a similar point in *Beyond Belief*, the quotation in this passage coming from the sayings of Jesus in the *Gospel of Thomas*:

> Discovering the divine light within is more than a matter of being told that it is there, for such a vision shatters one's identity: "When you see your likeness [in a mirror] you are pleased; but when you see your images, which have come into being before you, how much will you have to bear!" Instead of self-gratification, one finds the terror of annihilation. The poet Rainer Maria Rilke gives a similar warning about encountering the divine, for "every angel is terrifying."[672]

In a similar fashion, in 2009, John Polkinghorne, a former quantum physicist who became a Christian priest in the UK, published a book called *Questions of Truth: God, Science and Belief*. In this book, which is fifty-one responses to questions about the relationship between conventional science and traditional religion, Polkinghorne says, "God hides from us because if we ever clapped eyes on an infinite being, we'd be unable to carry on as we are. We'd be overwhelmed to the point of hopelessness. We'd sort of shrivel up."[673] Yes, that is exactly what happens. Isn't that wonderful?

Maslow points out that there is another psychological inhibitor that he ran across in his explorations of self-actualization:

> This evasion of growth can also be set in motion by a fear of paranoia. … For instance, the Greeks called it the fear of hubris. It has been called "sinful pride," which is of course a permanent human problem. The person who says to himself, "Yes, I will be a great philosopher and I will rewrite Plato and do it better," must sooner or later be struck dumb by his grandiosity, his arrogance. And especially in his weaker moments, will say to himself, "Who? Me?" and think of it as a crazy fantasy or even fear it as a delusion. He compares his knowledge of his inner private self, with all its weakness, vacillation, and shortcomings, with the bright, shining, perfect, faultless image he has of Plato. Then of course, he will feel presumptuous and grandiose. (What he fails to realize is that Plato, introspecting, must have felt the same way about himself, but went ahead anyway, overriding his own doubts about self.)[674]

Of course, such fears arise from the egoic mind, afraid of what others might think of how you think and behave. Once we reach our fullest potential as mystical panosophers, all problems and solutions cease to exist, for Wholeness is the union of all opposites. Under these circumstances, all we can do is follow the Divine energies arising within us, trusting in Life that any practical 'problems' will be solved as evolution unfolds. Nevertheless, we also need to bear in mind that Edward de Bono said in *The Use of Lateral Thinking* "In general there is an enthusiasm for the idea of having new ideas, but not for the new ideas themselves."[675]

This brings us to another aspect of the Jonah Syndrome. From the point of view of society, Maslow points out, "Not only are we ambivalent about our own highest possibilities, we are also in a perpetual … ambivalence over these same highest possibilities in other people," which he calls 'counter-valuing'. As he goes on to say,

> Certainly we love and admire good men, saints, honest, virtuous, clean men. But could anybody who has looked into the depths of human nature fail to be aware of our mixed and often hostile feelings toward saintly men? Or toward very beautiful women or men? Or toward great creators? Or toward our intellectual geniuses? … We surely love and admire all the persons who have incarnated the true, the good, the beautiful, the just, the perfect, the ultimately successful. And yet they also make us uneasy, anxious, confused, perhaps a little jealous or envious, a little inferior, clumsy.[676]

In Scandinavia, this ubiquitous counter-valuing tendency has been encapsulated in a cultural law, called *Jantelagen* (the law of Jante), a concept created by the Norwegian/Danish author Aksel Sandemose in his novel *A Refugee Crosses His Tracks* in 1933. The novel portrays the small Danish town Jante, modelled on his hometown, where Janters who transgress an unwritten 'law' are regarded with suspicion and some hostility, as it goes against communal desire in the town, which is to preserve social stability and uniformity. In essence, this law states that no one is special or better than anyone else.

Jantelagen, lying deep in the Scandinavian subconscious, is a rather ambivalent philosophy. For while it can lead to social stability and harmony, it actually inhibits people from realizing their fullest potential as human beings. Like the story of six blind men who seek to know what an elephant is, it is only permitted to see the elephant from the perspective of the tail or the trunk, for instance. To see the elephant as a

whole is not allowed, for this would make anyone with such a Holoramic perspective special and hence unacceptable, a clear sign of counter-valuing.

The central problem here is the immense power of the abstract modelling methods that information systems architects use to build the Internet. For when these are intelligently and consciously generalized into the commonsensical system of thought we all use everyday, we realize that **Being** is the all-inclusive superclass of all concepts, illustrated in the diagram on page 50. As mentioned there, **Being** includes everyone's theories, opinions, and beliefs. Nothing is left out. That, in essence, is why my individual consciousness has deepened and expanded to such an extent that it has become coterminous with Consciousness itself.

Such a wonderful experience of Wholeness is counter to today's postmodernist movement, which tends to denounce structuralism in psychology, anthropology, linguistics, and mathematics. For Jean Piaget defined the primary characteristic of structuralism as wholeness, whose essence is relationships.[677] In contrast, there is much scepticism in today's postmodern society that a 'grand narrative' can explain all our experiences from the mystical to the mundane.[678]

But when I attempt to explain my generalizing experiences to my friends and associates, they think I am being disrespectful, not honouring their own specialist perspectives. They then project these inner feelings outwards, saying that I have an inflated sense of my own importance, that I am trying to make myself special, with what they think are messianic aspirations. So when I'm conversing with my friends and neighbours, I hide my light under a bushel. They cannot image that the man strolling around their neighbourhood has solved a problem that has baffled the most brilliant minds through the ages.

Anthony Storr's books on the pathology of genius have greatly helped me to deal with this social situation, combined with my own introspective spiritual practice. He introduced *Solitude* with this quote from Edward Gibbon, "Conversation enriches the understanding, but solitude is the school of genius; and the uniformity of a work denotes the hand of a single artist."[679] And in *The Dynamics of Creation*, Storr describes how Einstein and Bertrand Russell had a love for humanity greater than for individuals.[680] Similarly, Antonina Vallentin, a close friend of both Einstein and his wife Elsa, wrote, "Einstein has achieved a detachment which few other people have ever attained. He is equally dissociated from the impression he makes on the world and from the repercussions of his fame."[681]

On the religious implications of healing the split between mysticism and science, Carter Phipps told us in an extensive article in the Spring/Summer 2003 issue of the *What is Enlightenment?* magazine, at the end of time, the Jews expect the Messiah, the Christians the second coming of Christ, together with the anti-Christ, the Muslims the Mahdi, the Hindus the Kalki Avatar, and the Buddhists Maitreya.[682]

Such prophecies are where people's projections come from. For I am doing my utmost to live in the eschatological Age of Light at the end of time. If we do not live our vision today, we never shall, for tomorrow never comes. So it is not true that there is no one alive today who has lived through the apocalypse that people are anticipating, as John Petersen's quote on page 132 indicates. But then I am paradoxically told that I am a man living ahead of my time, not fitting into any social structure in the world today, of little value to my contemporaries.

But how can this be? Millions of spiritual seekers are learning to live in the Eternal Now, beyond time, inspired by Eckhart Tolle's *The Power of Now*, recognizing that none of us is ever separate from any other being, including the Supreme Being, for an instant. As we see on page 122, Thich Nhat Hanh has

foreseen that the next Buddha—as Maitreya, the 'Loving one'—can only be a community or global sangha, practising mindful living rather than an individual.

Perhaps the best way of describing my situation vis-à-vis society is to say that I have won the lottery. This should not be surprising, for it is in the nature of lotteries for there to be a winner, as John Leslie points out when exploring the possibility of humanity as a whole winning the lottery, briefly mentioned on page 146. It just so happens that this being called 'Paul Hague' has been picked out of the urn to win it, which has absolutely nothing to do with him, as an individual, never separate from the Divine for an instant. But the prize is not to be measured in financial terms. The prize is spiritual and cognitive Wholeness, literally out of this world.

However, although serendipity and synchronicity have played a vital role in my development, when looked at as a whole, the events in my life have not been completely random. Panosophy fully explains its origin in human terms, as I have hinted at from time to time, leading to the sequence of events in my life. However, I have found that when I give specific details, they are too distracting. So I've exercised a little self-censorship in this book.

These are just some of the psychological issues that I have been wrestling with for the past thirty to thirty-five years, as I have sought to unify mysticism and science, the central theme of my life. In human terms, I liken my situation to that of the mezzosoprano Janet Baker, who once said in a BBC radio interview that she was an ordinary person doing an extra-ordinary job. Similarly, creating a megasynthesis of all knowledge is an extra-ordinary job. But that does not make its putative author special, 'putative' because Paul is not the originator of this treatise. He is simply a channel for the Divine, writing as a prophet, one who consciously speaks forth from the depth and breadth of his being, from the Origin of the Cosmos.

The way that I deal with this tricky situation, theoretically, at least, is to use the Principle of Unity and the Cosmic Equation that explains everything to note that we have all have two inseparable identities, Divine and human, as described on page 122. But putting this theory into practice in social relationships is not easy when most are preoccupied with the nitty-gritty of daily life in the dualistic world of form. Nevertheless, I feel that I have made much progress in recent years, letting go of any emotions that might come up during the course of the day as soon as possible after they arise.

I use the word *I* to refer to myself, even though people might think that I am being rather egoic and hubristic in doing so. Some spiritual teachers refer to themselves in the third person or with just an initial. For instance, J. Krishnamurti and Bernie Prior referred and refer to themselves as *K* and *B*, respectively. But this approach would not work for someone called *Ingrid* or *Isaac*, for instance. Besides, Barry Long would often say in his seminars that there is only one 'I' in the Universe, the Divine Essence that we all share, as Love.

So who is this being called *Paul Hague* with both Swedish and British social-security numbers? Well, unlike Indian children, who are often given spiritual names or virtuous qualities to grow into, the opposite has happened to me in my lifetime. For *Paul Hague* means someone living in or by a small, enclosed field surrounded by hedges.

The root of *Paul* is Latin *paulus* 'little, small', from PIE base **pau-* 'few, little', also root of *few*, *poor*, *foal*, *puerile*, *pusillanimous* 'small minded, cowardly', from Latin *pullus* 'young animal' and *animus* 'reason, mind', *paediatrician*, from Greek *pais* 'child' and *iatros* 'healer', and *encyclopaedia* 'general course of

instruction', from pseudo-Greek *enkuklopaideia*, mistaken by Quintilian, Pliny, and Galen for *enkuklios paideia* 'all-round education'.

Hague derives from the Old Norse *hagi* 'an enclosed piece of land', indicating that I am descended in the male line from the Vikings, who settled in the north-east of England, where my great great great grandfather David was born in 1786. In modern Swedish and Norwegian, *hage* means 'meadow' and 'garden', respectively. The word *hedge* is cognate with these words.

In contrast, Life has demolished the fences that we build between the separate fields of learning, so that I could consciously live in the Field, the seamless borderless continuum that is Ultimate Reality. As a consequence, I have very little protective armour in Wilhelm Reich's terms. As he says in *Character Analysis*, "Rarely are our patients immediately accessible to analysis, capable of following the fundamental rule of really opening up to the analyst," having confidence in a strange person.[683] In 'The Psychology of Birth, the Prenatal Epoch, and Incarnation', Ralph Metzner suggests the imagery of *skins*, *coverings*, or *clothing* rather than armour. For as he says, "whereas it's difficult to conceive how one would function in the world if all one's armouring is dissolved or removed, it makes sense that one's character clothing or coverings could become comfortable, flexible and appropriate".[684]

Having no protective armouring means that I am utterly naked, vulnerable, and hypersensitive, which makes relationships with my fellow human beings extremely difficult, surrounded, as most are, by protective coverings defending their illusory boundaries. So even though my friends sometimes comment on my patience, I must admit that I occasionally get frustrated, even angry, with the situation I find myself in today, having no apparent resolution in terms of human relationships. For, at heart, I am just a regular, easy-going guy, not very good at anything in particular, but very thorough in subjects and activities that interest me.

Nevertheless, I just keep going, day after day and year after year, trusting that one day more and more people will be able to make the paradigm change from conflict-ridden either-or thinking to a more harmonious and cooperative both-and approach to life. In terms of human relationships, it is vitally important to understand that by the Principle of Unity, perfection is the union of perfection and imperfection, as I told my feisty girlfriend in 1982, when I was working in Kuwait developing a new accounting system for the Institute for Scientific Research there. There are no ideals or moral imperatives that we can live up to absolutely in the relativistic world of form, no matter how much we might strive for excellence. Life is happening in ways that none of us has any control over, as we are all inseparable from each other, the Cosmos, and the Divine.

The well-known prisoners' dilemma in games theory[685] well illustrates the difficulty of living with a holistic, both-and approach to life in a culture that is based on a divisive, either-or philosophy. The optimum outcome of the game is when both prisoners adopt a cooperative, both-and approach. They are worse off if they both use a selfish, competitive, either-or approach. But if one adopts a both-and approach and the other an either-or, then the former suffers even more in worldly terms. So it takes immense courage and faith in the Divine to adopt an all-inclusive approach to life, which the prevailing culture generally regards as being counter-cultural, unacceptable, and even impossible.

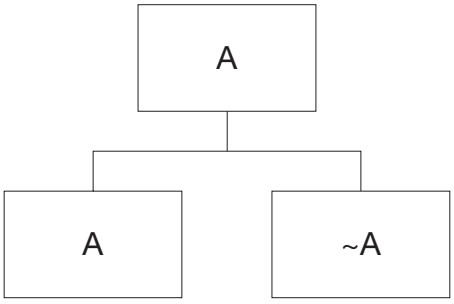
Yet, in wordless meetings with friends, mostly women, as we look at each other directly in the eye, we reflect our True Essence in each other, which is Love. Such Divine, shared experiences give me the faith that one day I shall be able to return to society, making a worthwhile contribution, completing steps sixteen and seventeen in Joseph Campbell's model of the spiritual journey, simultaneously living in two worlds, the mystical and the practical.

9. Alliance for Mystical Pragmatics

Given the great turmoil that the world is in today, where could we collectively go as a species, even in the next five to fifteen years, covering my own natural lifespan. Most particularly, what are the chances of humanity fulfilling Teilhard's vision by the time my children and grandchildren are my age today, around 2045 and 2085, respectively: "The way out for the world, the gates of the future, the entry into the superhuman, will not open ahead to some privileged few, or to a single people, elect among all peoples. They will yield only to the thrust of all together in the direction where all can rejoin and complete one another in a spiritual renewal of the Earth."[686]

Well, the answer to this question is very much dependent on how many people have the courage to pick up the key that unlocks the innermost secrets of the Universe, revealing the root cause of conflict and suffering. Heraclitus called this key the Hidden Harmony, for very few of his contemporaries knew where it was to be found. And not many since then have found it for it is very heavily defended by the egoic mind, by the false belief that we humans are separate from the Divine and each other.

For myself, as this book describes, I was given this key at midsummer 1980, since when it has governed every moment of my life. But it did not immediately free me of conflict and suffering. It has taken me half a lifetime of self-inquiry to walk my talk, to demonstrate to my friends and neighbours in daily life what the Hidden Harmony really means. For while what I call the Principle of Unity and Cosmic Equation can be written down, as in this diagram, it is only when it is fully assimilated into consciousness in community with others who are similarly guided by the Hidden Harmony that we can bring about World Peace, fulfilling Teilhard's vision of a harmonious society of superintelligent, superconscious beings.



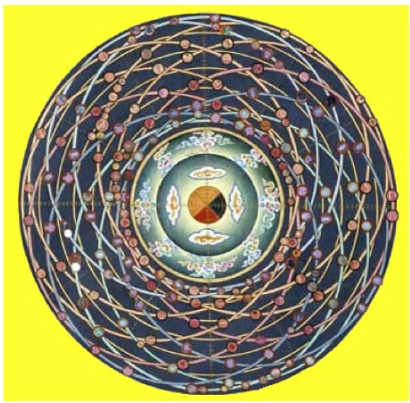
In a culture that is based on the seven pillars of unwisdom—particularly the conflict-ridden seventh—this means that we need to invoke Mohandas Gandhi's *Satyagraha* 'Truth force' and Ananta Kumar Giri's principle of compassionate confrontation to realize our purpose. It is in this spirit that I have written this book, much inspired by the final chapter in the *Bhagavad Gita*, which teaches that while it is natural to engage in challenging work, it is also essential to be free of egoic attachment to the fruits of that action.[687] This does not mean indifference to the results of these activities. For as Gandhi said, "He who … is without desire for the result and is yet wholly engrossed in the fulfilment of the task before him is said to have renounced the fruits of his action."[688]

This principle also lies behind my proposal to set up the Alliance for Mystical Pragmatics with the motto 'Harmonizing evolutionary convergence', inspired by the Hidden Harmony, symbolized in the logo for the Alliance. *Pragmatics* derives from Latin *prāgmaticus* 'skilled in business', from Greek *prāgmatikos* 'active, business-like,

versed in affairs, relating to fact', from *prāgma* 'deed, action, fact', from *prāssein* 'to do, make, manage', also root of *practical*. So we can regard pragmatics as the science or study of our practical business affairs, extending the conventional linguistic and semiotic meanings of the word. Mysticism, on the other hand, is focused on being in egoless union with the Formless Divine. Mystical Pragmatics is thus an oxymoron, unifying two extremes of human endeavour: mysticism and reason. For the only practical way to live in today's rapidly changing society is as a mystic.

To overcome the appearance that we humans are separate from each other, I feel that this clone of quaking aspen, *Populus tremuloides*, in Fishlake National Forest in Utah, could inspire our cooperative activities. It is known as *Pando*, Latin for 'I spread',[689] for what appears to be a forest of separate trees spreading over forty-three hectares is actually one organism, with a single root system, estimated to be about 80,000 years old. So while the forty-seven thousand trunks are born and die over the years, the underlying root that they all share transcends the generations.[690]

We can regard the root system of this clonal colony or genet of genetically identical individuals as a metaphor for the Immortal Ground of Being that we all share. For while we are all unique beings, with our own particular propensities in life, if we are to intelligently live in harmony with the fundamental law of the Universe, we need to share the common purpose of recapitulating the Cosmogonic Cycle by returning to the Nonmanifest while fully alive in our bodies.



With such a solid foundation, we could all reflect the brilliant light radiating through each of us, like Indra's Net of Jewels in *Avatamsaka Sūtra* '*Flower Ornament Scripture*',[691] which well illustrates the mystical worldview that could guide our convergent activities. For this 1600-page book in English translation is "the consummation of Buddhist thought, Buddhist sentiment, and Buddhist experience. … no religious literature in the world can ever approach the grandeur of conception, the depth of feeling, and the gigantic scale of composition, as attained by this sutra," as D. T. Suzuki put it.[692] As he remarked, "Hua-yen is the philosophy of Zen and Zen is the practice of Hua-yen."[693] And as Francis H. Cook wrote in *Hua-yen Buddhism: The Jewel Net of Indra*: "Western man may be on the brink of an entirely new understanding of existence."[694] This is how he encapsulated the essence of Indra's net:

> Far away in the heavenly abode of the great god Indra, there is a wonderful net which has been hung by some cunning artificer in such a manner that it stretches out indefinitely in all directions. In accordance with the extravagant tastes of the deities, the artificer has hung a single glittering jewel in each 'eye' of the net, and since the net is infinite in dimension, the jewels are infinite in number. There hang the jewels, glittering like stars of the first magnitude, a wonderful sight to behold. If we now arbitrarily select one of these jewels for inspection and look closely at it, we will discover that in its polished surface there are reflected *all* the other jewels in the net, infinite in number. Not only that, but each of the jewels reflected in this one jewel is also reflecting all the other jewels, so that there is an infinite reflecting process occurring.[695]

It is such metaphors that have kept me going over the years, as I have beavered away alone in my study-bedroom in the depths of the Swedish wilderness. For these analogies tell me that while I have lived in solitude for thirty-five years in order to answer the most critical unanswered question in science, I

have not been completely isolated from my fellow human beings, with their own aspirations, interests, and projects.

In practical terms, as I am a transcultural, transdisciplinary generalist, I am able to see how all disciplines in academia, all occupations in the workplace, and all religions in the world fit together as a coherent whole. I thus envisage the Alliance as a network of networking networks, with as many individuals and organizations who wish to join us working harmoniously together with a single purpose: World Peace through the integration of three great global movements, Spiritual Renaissance, Scientific Revolution, and Sharing Economy.

A historical perspective

This initiative was originally inspired by workshops that Ananta Kumar Giri of the Madras Institute of Development Studies has been holding around the world since 2011 on Practical Spirituality and Spiritual Pragmatics, as a development of a vision that I originally had in 1984 for the Paragonian Institute, with the motto 'Serving the Whole'. I met Ananta in Sweden in February 2013, when he invited me to give a talk on 'The Awakening of Intelligence' at the Copenhagen Business School at a workshop he was holding on Spiritual Pragmatics with Søren Brier, professor in the semiotics of information, cognition and communication science there.

Ananta also invited me to write a 7,000-word essay on 'Mystical Pragmatics: Harmonizing Evolutionary Convergence', one of the very few invitations I have had during my studies into the root causes of the exponential rate of evolutionary change in the world today. The Indus Business Academy published this essay in September 2015 in *3D: IBA Journal of Development* in its January–June 2014 edition on the theme 'Spiritual Pragmatism and Spiritual Pragmatics', which Ananta edited.

I received these invitations because I had spent three months in the autumn of 2012 studying the life and work of Charles Sanders Peirce, a kindred spirit who came closer to bringing mysticism into logic and scientific method with his triadic architectonic than anyone else I have read. Most particularly, Peirce was the founder of the philosophy of pragmatism, which he introduced in an article in 1878 titled 'How to Make Our Ideas Clear', although he did not actually use the word *pragmatism* in this essay.

In the event, it was not until 1900, when Peirce wrote to his closest friend, the philosopher and psychologist William James, that they realized that they had been using the term for many years in philosophical conversation without it appearing in their publications and without a clear definition of the term, which the *Century Dictionary Supplement* eventually gave as "A theory concerning the proper method of determining the meaning of conceptions."[696]

In Peirce's original article, he wrote that clearness of apprehension could be attained in this way: "Consider what effects, which might conceivably have practical bearings, we conceive the object of our conception to have."[697] So, if our conceptual models of the world we live in are not crystal clear and fully integrated, we have little chance of intelligently managing our business affairs or our lives in general with full consciousness of what we are doing.

Another source of inspiration for the Alliance for Mystical Pragmatics is the Moravian Jan Ámos Komenský (Comenius), known as the 'father of modern education', whose work I discovered in July 2014, when investigating the first uses of *pansophy* in English, mentioned in the *Oxford English Dictionary*. Comenius set out his pansophic education system, unifying religion and science, in *The Great Didactic*, written in the mid 1630s, but not published until 1657 in Part I of his *Collected Works*, *Opera didactica*

omnia: *Setting Forth the Whole Art of Teaching All Things to all Men*, by which he meant women and well as men, girls as well as boys, at all levels of ability.

To put these educational principles into practice, Samuel Hartlib, a German merchant and intelligencer, invited Comenius to London in 1641, with the tacit approval of the House of Commons in the newly formed Long Parliament, to set up a Pansophic College. However, in the event, the English Civil War broke out and Comenius' proposal for an Academy of Universal Wisdom and Light did not take off. This was a pity, for as Matthew Spinka, Comenius' biographer, wrote in 1943, "Were the grandiose project accomplished in our day, what a boon it would be! But alas! the world is still waiting for its realization, and we seem to be further away from it than ever."[698]

Nevertheless, Theodore Haak, a close friend of Hartlib and one of the co-workers on Comenius' pansophic scheme in 1641, arranged meetings from 1645 of a few "worthy persons inquisitive into Natural Philosophy", forming a club known as the 'Invisible College'.[699] This 'Invisible College' was the precursor to the Royal Society of London for Improving Natural Knowledge, established with this title in 1663.[700] However, as the Royal Society also evolved from John Wilkins' Oxford Experimental Science Club that wanted to have nothing do with 'Pansophia',[701] this august body has taken Western thought further and further away from Reality with every year that has passed since then.

It is time to redress this balance, putting into practice the Royal Society's motto, which is *Nullius in verba*, which roughly translates as 'take nobody's word for it.' As the Royal Society's website says, this motto "is an expression of the determination of Fellows to withstand the domination of authority and to verify all statements by an appeal to facts determined by experiment."[702] And its mission is: "To recognise, promote, and support excellence in science and to encourage the development and use of science for the benefit of humanity."

Today, the Royal Society's authority dominates science, inhibiting the introduction of the science of humanity that Giambattista Vico set out to develop in the first half of the eighteenth century with *The New Science*, counteracting Descartes' dualism and Newton's mechanistic materialism. At the heart of Vico's New Science is the principle that we humans possess an inherent *sapienza poetica* 'poetic wisdom', which informs our responses to our environment in the form of a metaphysics of metaphor, symbol, and myth. Indeed, by turning to the 'crude origins' of poetic wisdom and mystical theology, Vico regarded metaphysics as the most fundamental of all the disciplines, from which various sciences branch out as if from a tree trunk, poetic logic, poetic politics, and poetic physics being some of the branches.[703]

Vico thus prefigured Erich Fromm's call for a new science of humanity in *To Have or To Be?* two and a half centuries later. However, Fromm was uncertain of success, saying,

> Whether such a change from the supremacy of natural science to a new social science will take place, nobody can tell. If it does, we might still have a chance for survival, but whether it will depends on one factor: how many brilliant, learned, disciplined, and caring men and women are attracted by the new challenge to the human mind.[704]

Fromm went on to say that he saw only a two per cent chance of such a radical transformation in consciousness coming about, a goal that no business executive or politician would regard as worthwhile pursuing. Nevertheless, he went on to say, "If a sick person has even the barest chance of survival, no responsible physician will say, 'Let's give up the effort,' or will use only palliatives. On the contrary, everything conceivable is done to save the sick person's life. Certainly, a sick society cannot expect anything less."[705]

A central problem is that the Royal Society has a very narrow understanding of how we develop natural knowledge through science. For the most important experiment that any of us can undertake in our lives is to look inwards, discovering that none of us is ever separate from the Divine for an instant. As mystics have taught through the ages, this is something that we can know with absolute certainty. This is our birthright, genuine natural knowledge, which we can better call *gnosis* or *jñāna*, from Greek and Sanskrit, both cognate with *know* itself, meaning 'spiritual wisdom and illumination, inner knowing of Ultimate Reality'.

Such mystical understanding is absolutely essential if we are to intelligently address the dangers that arise from the mindless pursuit of technology. Martin Rees, a former President of the Royal Society, likens these dangers to the threat of nuclear war, which dominated the first half of my life. In *Our Final Century*, he wrote, "In the present century the dilemmas and threats will come from biology and computer science, as well as from physics: in all these fields society will insistingly need latter-day counterparts to Bethe and Rotblat."[706]

Hans Bethe and Joseph Rotblat were two leading scientists, deeply concerned about the threat of nuclear war in the 1950s. Eleven concerned scientists, led by Rotblat, signed what became known as the Russell-Einstein Manifesto, issued on 9th July 1955, containing the words, "Remember your humanity, and forget the rest." This Manifesto was followed by the first Pugwash conference on Science and World Affairs in a village in Nova Scotia in July 1957, Rotblat and the Pugwash conference being awarded the Nobel Prize for Peace in 1995.[707]

We need something similar today if we are to manage the transition to the eschatological Mystical Society as smoothly as possible. Not that this is easy, for to reach the Promised Land, evolution has to pass through an apocalyptic discontinuity, revealing the Hidden Harmony. Such a revelation leads to the contextual inversion of the Western worldview, helping us to understand that Teilhard's *Milieu Divin*, as the Numinosphere, provides the Cosmic Context and Gnostic Foundation for all our lives, not the physical universe. Many spiritual seekers know this today. So it is this group of pioneers, embodying the spiritual renewal of the Earth, who are in the vanguard of this Great Awakening.

Completing the revolution in science

But we also need an epoch-changing scientific renewal, far more radical than Francis Bacon's *Instauratio Magna* (*Great Renewal*), from Latin *instaurāre* 'to restore, renew; set up, establish', partially published in 1620, but never finished. It is time to do so now, by generalizing the business modelling methods that information systems architects use to build applications and databases on the Internet. Once again, this is simplicity itself, although not always so easy.

Throughout history, we have been organizing our ideas in sets, tables, hierarchies, and networks. So if evolution is to become fully conscious of itself, what we need to understand is that these ordering principles provide the coordinating framework for our entire society, held in place by the Cosmic Equation, which is like the keystone in an arch, preventing the structure from collapsing in on itself.

Yet, as evolution has now passed its Accumulation Point in systems theory terms, we have so little time. Even leading spiritual teachers, evolutionaries, and transhumanists have found what appears to be a safe niche within a society that is falling apart. I can see only one way out of this dilemma. Humanity will only awaken to what is happening to us all as a species through a gigantic life shock, which all can feel in the depth of their beings.

One possibility is that the inherently unstable global economy will soon self-destruct, for the next financial crisis could be the last, from which capitalism and communism would never recover. However, the world is utterly unprepared for such an eventuality, even though many feel that it is coming, even looking forward to it, for such a cataclysmic event could release a rush of synergistic, creative energy. Nevertheless, there would also be much panic, as people's monetary immortality symbols, which give them a precarious sense of security and identity in life, disappear.

We cannot avoid this inevitable discontinuity in evolutionary history, as visionaries like Jean Houston and John Petersen foresee, as mentioned on page 131. All we can really do is intelligently prepare for the post-apocalyptic epoch as consciously as we can. To this end, if we could publish the solution to the ultimate problem in human learning, this could create a collective life shock that could bring humanity to its senses.

Today, physicists call this ultimate problem the 'Theory of Everything', still not found, as this 'advertisement' on the front cover of *New Scientist* indicates, which I discovered on the bookstands when visiting London in May 2005 to promote my first book *The Paragonian Manifesto*.

The accompanying cover story stated the purpose of such a theory of everything: "Physicists believe that there was only one force just after the big bang, and as the universe cooled it split into the four forces we now observe: gravity, electromagnetism, and the strong and weak [nucleic] forces. The physicists' dream is to find a theory describing this unified force."[708] In *The Elegant Universe*, Brian Greene gives a slightly different definition: "a theory capable of describing nature's forces within a single, all-encompassing, coherent framework".[709]

By admitting psychospiritual energies into science and by asking questions that scientists do not normally ask, we can introduce the genuine Theory of Everything to the world. This would help us in our collective endeavours to reach evolution's glorious culmination on our beautiful planet Earth—its Apotheosis and Omega Point, inseparable from the Alpha Point. For we would then recognize that the force that unifies the psychospiritual and physical energies at work in the Universe is contained within the meaningful relationships that lie within structure.

However, the article in the *New Scientist* lamented the fact that no one had yet found a way of solving this elusive problem. One difficulty here is Aesop's fable of the shepherd boy who cried wolf.[710] Many people have written books and treatises seeking grand unified theories, but they have all fallen short of their aim, rather like the boy who cried 'Wolf! Wolf!' when there was no wolf to threaten his sheep. So if an innocent boy comes along with the genuine Theory of Everything, nobody believes him and he is ignored.

Nevertheless, it is still possible that someone somewhere will recognize the authenticity of Integral Relational Logic, the Cosmic Context, coordinating framework, and Gnostic Foundation for the Unified Relationships Theory. If so, one could become two, two four, four eight, and so one, synergistically generating a tidal wave of rapidly awakening intelligence and consciousness.

If this were to happen, we could collectively complete today's revolution in science outlined on page 57. With active support from such scientific revolutionaries, the publication of books and videos on transcultural, transdisciplinary Panosophy would thus lead to a revolution in science far more radical than those that Newton, Darwin, and Einstein introduced combined. For as evolution passes through its

spiritual Singularity in horizontal time, this will highlight the seven greatest turning points in human history, summarized on page 139.

To be more specific, if it were acknowledged that the Unified Relationships Theory is even more significant in the history of ideas than Newton's *Principia*, Darwin's theory of evolution, and Einstein's theories of relativity, this could have an immediate economic effect. For capitalism, in particular, is based on people's confidence that the economic machine will continue running indefinitely. The 'health' of the economy is thus measured each month by a confidence index, indicating people's willingness to purchase goods and services they do not need in order to keep people imprisoned in their jobs, out of touch with Reality. So it would probably not take very much for this confidence to collapse and the global economy would come crashing down around our ears.

Under these circumstances, if we are to deal with all these momentous changes with equanimity, we need to cocreate a nourishing social environment where it is safe to question all the beliefs and assumptions on which the cultures of the world are based today. Everybody will need to go into therapy when the global economy self-destructs in order to heal the existential fears that will bubble up to the surface. Because such a stimulating, therapeutic environment does not yet exist, that is why we urgently need to establish the Alliance for Mystical Pragmatics.

Revealing the Hidden Harmony

The primary purpose of the Alliance is to cocreate World Peace, by which I don't just mean that we have stopped fighting and killing each other in order to defend the beliefs and cognitive structures that give us a precarious sense of security and identity in life. Rather, a spiritual community can only live in Peace when all participants in the community are living in deep Inner Peace, which exists when we live in union with the Divine in Nonduality. The English language does not have two words to distinguish Inner Peace and absence of external war, unlike Swedish, where *frid* and *fred* have these meanings. So in Sweden, where I live, it is easier to communicate this vitally important point than in English-speaking countries.

It is from the Presence of Divinity that we can end the long-running wars between mysticism and science and between all the organized religions, intelligently embracing Heraclitus' Hidden Harmony in consciousness. To denote that the Principle of Unity and the Cosmic Equation act as the fundamental design principle of the Universe, the coordinating project for all the Alliance's activities is called Project Heraclitus, with the motto 'Revealing the Hidden Harmony'.

I wrote a first draft for Project Heraclitus in preparation for attending a one-day conference in London on 21st November 2009, the day that CERN planned to restart the Large Hadron Collider (LHC) to search for the elusive Higgs boson. David Lorimer, the Programme Director of the Scientific and Medical Network (SMN), had organized the conference in honour of David Bohm, with the title 'Infinite Potential: The Legacy of David Bohm'. It was a rather ironic day to choose, for the philosophy of atomism does not lead to Wholeness, as Bohm pointed out in the quotation on page 107.

In November the next year, I wrote an updated 20-page proposal for Project Heraclitus, sending copies to the leaders of SMN and the Institute of Noetic Sciences (IONS). On the strength of this, David invited me to attend a select, ten-person symposium at Cawdor Castle in Scotland on 'Consciousness and Nonduality'. There I met Rupert Spira, a leading teacher of Nonduality, who suggested that I give a presentation on my work at the Science and Nonduality (SAND) conference, at which he regularly held reflective sessions.

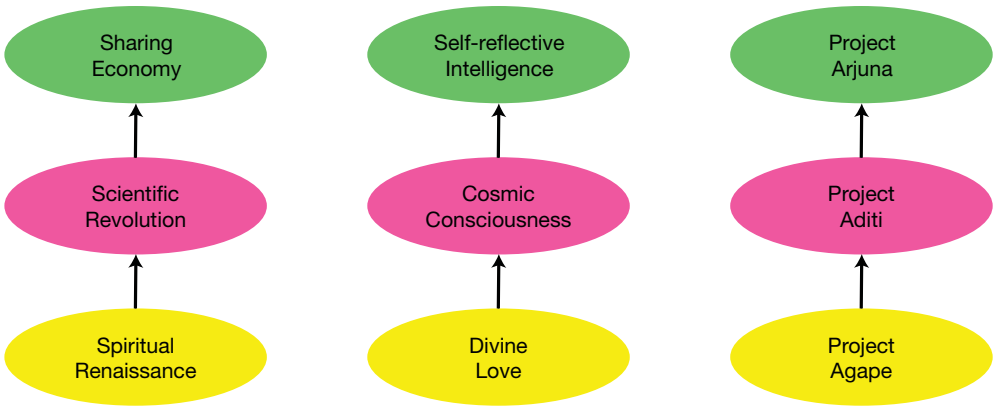
The SAND conference in October 2011 in California was on the theme 'The Edge of Time', so I naturally applied to give a presentation on 'The Two Dimensions of Time', which lie at the heart of mystical pragmatics. However, as it is difficult to present a lifetime's work in just a 20-minute speaking presentation, I prepared a poster presentation 8 × 4 feet (2,438 × 1,219 mm), with an 8-page handout. As a follow-on to the presentation, I updated my proposal for Project Heraclitus and wrote an extended essay on 'The Singularity in Time', inspired by an essay with a similar title by Peter Russell,[711] where I had learnt about the technological singularity, which Victor Vinge and Ray Kurzweil were pursuing.

Then at the beginning of 2012, I learned that the John Templeton Foundation was offering to fund projects within a Core Funding Area titled 'Breaking New Ground in Science and Religion', which would "push the science and religion dialogue in fresh directions". For, as its funding proposal stated, the "science-religion dialogue … has largely been carried out from a perspective that is theistic (usually Christian), Western, methodologically focused, concerned primarily with the physical sciences."

Accordingly, although I was well aware that the Foundation had a reputation for conservatism, I applied for $200,000 to fund Project Heraclitus, the maximum allowed for any one project. As expected, I was not successful, which was actually something of a relief, for if I had been successful in my application, I would have lost some of my much-valued freedom and I would have published my work before it and I had reached sustainable maturity.

Since then, I have done little further work on Project Heraclitus other than to post my proposals on a new website for the Alliance, which my friend Pär Halleröd, living three hours north of me in Sweden, had designed. There I say that the Alliance seeks to synergistically unify and integrate three global movements emerging in the world today: Spiritual Renaissance, Scientific Revolution, and Sharing Economy.

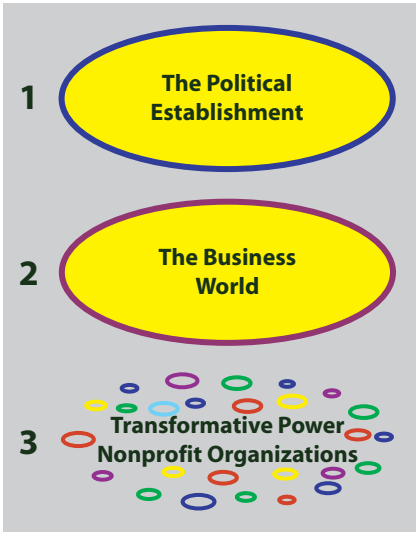
In turn, to match these three movements, Project Heraclitus will be organized into three subprojects, Project Agape, Project Aditi, and Project Arjuna, with the mottos 'Healing the split', 'Awakening Self-reflective Intelligence', and 'Transcending the Divisiveness of Money', respectively. Their purpose will be to transform the first, second to fourth, and fifth and sixth pillars of unwisdom into the corresponding pillars of wisdom, with Project Heraclitus, itself, transforming the seventh. These projects will be driven by the three fundamental energies of Divine Love, Cosmic Consciousness, and Self-reflective Intelligence, emanating, like Life, itself, from the Origin of the Universe, as this diagram illustrates.



Project Agape reflects the Greek word *agapē*, used by Christian writers in the New Testament to mean 'Divine Love'. Aditi is the Divine Matrix, a symbol for Consciousness, as the mother of the Universe in the *Rig Veda*. In turn, Arjuna was the spiritual warrior in the Hindu classic *Bhagavad Gita*, invoking time-honoured, both-and spiritual practices to deal intelligently with conflict-ridden, either-or politics.

Strategic considerations

That is where things rest at present. Tragically, Pär died in October 2014, so his beautiful website remains much as he left it. I have added some content within the structure he set up, but some key facilities are still missing, not the least for people to join the Alliance, should they be moved to do so. Pär also did some initial work on setting up bases on various social media websites, to which I'll return when this treatise is complete in draft, at least, and uploaded to the website.



However, launching the Alliance for Mystical Pragmatics remains as challenging as it has ever been. Ingemar Warnström, founder of the University of Global Well-Being in Sweden, illustrates what needs to happen here. In 2002, he attempted to set up a HOPE Alliance, *HOPE* being an acronym for 'Healing Our Planet Earth'. His hope was that we could take civilization in a quite new direction, building "a society in which the quality of life, fairness, and human values are central". Ingemar illustrated the need for greater cooperation with this diagram, showing how political and business institutions, in the first-tier of the consciousness spectrum, work symbiotically together, while the transformative powers of the alternative second-tier movement, which Paul H. Ray and Sherry Ruth Anderson call the cultural creatives,[712] are much fragmented.

It is vitally important not to see this situation as a battle of good versus evil, for what some regard as 'good', others consider 'evil', and vice versa, a moralistic conflict that can never be resolved in the dualistic world of form. Rather, what we are engaged in as a species is to apply our innate Love, Consciousness, and Intelligence to overcome existential fear and ignorance, which drive so much of society today.

The challenge we face here is no better illustrated than the list of the fifty most influential people in the world today, published by Business Insider in November 2015, depicted on the next page. As explained on its website, Business Insider used an algorithm to rank leading politicians, financiers, technologists, religious leaders, and entertainers in the four areas of economic power, command, newsworthiness, and impact.[713] But where are all these influencers taking us as a species? Well, as most of their activities are based on the seven pillars of unwisdom, it would seem that they are unknowingly driving humanity over the precipice.

So what to do? Could the Elders—a group of independent global leaders working together for peace and human rights, founded by Nelson Mandela—have an influence on the leading influencers? These are Martti Ahtisaari, Kofi Annan, Ela Bhatt, Lakhdar Brahimi, Gro Harlem Brundtland, Fernando H. Cardoso, Jimmy Carter, Hina Jilani, Graça Machel, Mary Robinson, Desmond Tutu, and Ernesto Zedillo, including five Nobel Peace Laureates.[714] Maybe these retired leaders could have an impact.

However, as the changes we really need to make in society can only arise from the Divine, we need to call on leading spiritual teachers to help us in our endeavours. In this regard, from 2011 to 2015, *Watkins Mind Body Spirit* magazine, published by Watkins Books, London's oldest and largest esoteric bookshop, has been publishing lists of 'The 100 Most Spiritually Influential Living People', based, in part, on how often they are googled.

The Dalai Lama, Eckhart Tolle, and Thich Nhat Hanh have been in the top three or four in each of these years. There is very little overlap with the global influencers, with Pope Francis appearing near the top in 2014 and 2015 and Oprah Winfrey not far behind in all five lists. Quite a few philosophers,


1. Barack Obama


2. Xi Jinping


3. Vladimir Putin


4. Angela Merkel


5. Warren Buffett


6. Narendra Modi


7. Pope Francis


8. Janet Yellen


9. Charles and David Koch


10. Bill Gates


11. David Cameron


12. François Hollande

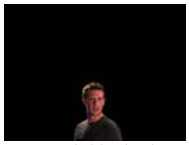

13. Jiang Jianqing


14. Shinzo Abe

15. Abigail Johnson

16. Jeff Bezos


17. Larry Page


18. Mark Zuckerberg


19. Larry Fink


20. Jamie Dimon


21. Sergey Brin


22. Li Ka-shing


23. Jack Ma


24. Mario Draghi


25. Carlos Slim Helu

26. Rob and Jim Walton


27. Amancio Ortega


28. Tim Cook


29. Wang Jianlin


30. Dilma Rousseff


31. King Salman bin Abdulaziz al Saud


32. Ali Khamenei


33. Michael Bloomberg


34. Rex Tillerson


35. Christine Lagarde


36. Oprah Winfrey


37. Larry Ellison

38. Elon Musk


39. Satya Nadella


40. Ban Ki-moon


41. Steve Schwarzman


42. Park Geun-hye


43. Robin Li


44. Ginni Rometty


45. Benjamin Netanyahu


46. Sheldon Adelson


47. Rupert Murdoch

48. Joaquín 'El Chapo' Guzmány

49. Mukesh Ambani


50. Jay Z and Beyoncé

scientists, and medical practitioners have caught my eye, moving up, down, and on and off the lists from year to year, such as Deepak Chopra, Ken Wilber, Peter Russell, Bruce Lipton, Rupert Sheldrake, James Lovelock, Stanislav Grof, and Ervin Laszlo.

If we are to collectively complete the final revolution in science, just as Isaac Newton completed the first, I suppose that the name of Paul Hague will need to be added to the list of leading influencers in due course, although I am not looking forward to this prospect in today's celebrity-mad culture. Nevertheless, if that is my destiny, I must just accept it, doing my utmost to be my easy-going, playful self as much as possible, which I often keep hidden, even from my friends.

Nevertheless, has Life really prepared me sufficiently to take on the awesome responsibility I seem to have been given? In this respect, I am not alone with my doubts. In March 1955, a month before Teilhard died, he wrote in 'The Christic',

> How is it, then, that as I look around me, still dazzled by what I have seen, I find that I am almost the only person of my kind, the only one to have *seen*? And so I cannot, when asked, quote a single writer, a single work, that gives a clearly expressed description of the wonderful 'Diaphany' that has transfigured everything for me?
>
> How, most of all, can it be that 'when I come down from the mountain' and in spite of the glorious vision I still retain, I find that I am so little a better man, so little at peace, so incapable of expressing in my actions, and thus adequately communicating to others, the wonderful unity that I feel encompassing me?
>
> Is there, in fact, a Universal Christ, is there a Divine Milieu?
>
> Or am I, after all, simply the dupe of a mirage in my own mind?
>
> I often ask myself that question.[715]

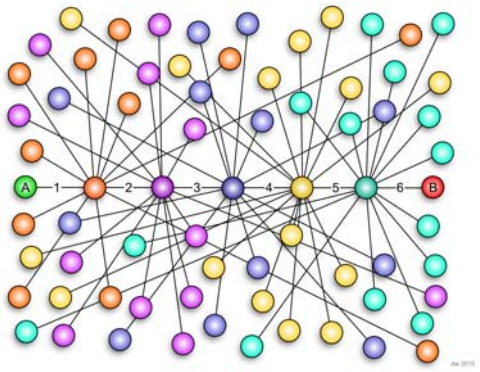
Maybe. Who can tell? If we have insights that are different from those around us, how can we tell that we are not deluded? It was just such a question that alarmed Bertrand Russell in his search for absolute certainty when David Hume showed that the scientific principle of induction could not be maintained on either logical or psychological grounds, as we see on page 44. But there is one thing that I do know with Absolute Certainty. No beings in the Universe are ever separate from the Divine, as the Absolute Whole, for an instant.

In this respect, it is vitally important to remember that the Universal Christ is not a person, as my friends who have studied the impenetrable *Course of Miracles* point out. Christ is the True Nature that we all share. Other names for our Genuine Identity are *Buddhahood* and *Turiya*, as the union of Brahman and Atman in the *Mandukya Upanishad*. As Osho said in *The Book of Secrets*, the first of his many books of transcribed series of mystical discourses, anyone can become a Buddha, for you are already a Buddha, only unaware.[716] As the Zen master Linji Yixuan is reputed to have said, "If you meet the Buddha [on the road], kill him."

Novelties of cocreation

Having revealed our Authentic Self by killing the Buddha (and the Christ), we now have the rock-solid Gnostic Foundation and the all-embracing Cosmic Context from which to view the Alliance as a business. By climbing down from the Mountain, we can address humanity's unprecedented problems, requiring unprecedented solutions as novelties of cocreation. To this end, we clearly need to produce a number of deliverables, which have never been seen before, gathering together the collective wisdom of those who can see what is happening to humanity at the present time.

That is why this book on *The Four Spheres* has been written in the way that it has. It could be used as the seed from which a mighty forest could grow, not unlike the clone of quaking aspen, depicted on page 162. Such endeavours will require teamwork, whose first task is to clear away the stones and thistles that inhibit growth today, using the radiant Light of Consciousness to nourish our activities.



But I do not wish to turn these business activities into commercial enterprises, for that would be contrary to the fundamental principles of the Sharing Economy in the Age of Light and the Mystical Society. Rather, to launch the Alliance, it will rely on the six degrees of separation in the 'small world' hypothesis: everybody in the world is six or fewer steps away—by way of introduction—from any other person in the world.[717] So by connecting with the few people who have so far shown an interest in the objects of the Alliance and in completing the final revolution in science, in just a few steps it should be possible to attract the sponsorship that is needed to get the Alliance off the ground.

The most obvious source of such sponsorship is from those who call themselves philanthropists 'lovers of humanity', from Greek *philanthrōpos* 'human-loving', from *philein* 'to love' and *anthrōpos* 'human being', some of whom are among the list of the fifty most influential people in the world today, listed on page 170. Should this not work out, other possibilities for funding are crowdsourcing and individuals working without payment, such as in Open Source software projects.

However, nothing much is likely to happen until a spark ignites Project Heraclitus, transforming conflict-ridden, either-or thinking into a cooperative, both-and approach to life. The challenge here is that when such a spark emerges, the Jonah Syndrome often comes into play and the spark is quickly extinguished, as I know from my own experience. Vijai Shankar, a leading Advaita sage, could see the dilemma I was in when I met him in 2002. His advice was to let go of my ambivalence, of any fears of what people might think of me and the Ultimate Boon that I have to offer the world. For as he could see, the Hidden Harmony is just what the world needs right now in its process of Transformative Harmony and so would spread like wildfire.

So is the time right to ignite the spark? Well, my intuition (or maybe my wishful thinking) tells me that it is and that one day fairly soon a miracle will happen to heal the pandemic Jonah Syndrome. And when this happens, we shall be able to recruit a staff of between five and fifty pioneers to produce the Alliance's deliverables. The Alliance will then be self-generating, tapping into the creative power of Life, free of the blocks that inhibit us from awakening to Total Freedom today.

To ensure effective communications within the Alliance, the most important outcome of our creativity will be the Glossary of transcultural, transdisciplinary terms. This is absolutely essential, for English, like the other European languages, has evolved during the past one thousand years to represent a worldview that is very far removed from Reality. So, if we are to rebuild society on the Truth, we need to change the meanings of many words, as they are understood today.

As mentioned on page 20, David Bohm suggested a solution to this problem to me thirty years ago with his notion of the archaeology of language. By looking at the root meanings of words, going back to their Proto-Indo-European roots as much as possible, we find a language that reflects ancient wisdom, much closer to the Divine Source of everything than English is today.

I liken this transformation of language to a change in bidding systems in bridge, which I played a little as an undergraduate and with my first wife in the 1960s and 70s. Most significantly, a change in the meaning of one bid requires changes in many others if the sequence and totality of possible bids is to convey accurate information about the hands that have been dealt. For instance, the meanings of 'one

club' and 'one diamond' are quite different in a natural bidding system, like Acol or Goren, from an artificial bidding system, like Precision Club.

Another issue that the Glossary needs to address is that people often use different words to refer to the same concept and the same words to refer to different concepts, making effective communications very difficult. This is a problem that information systems architects face in developing integrated business systems. For example, finance, marketing, and distribution departments may well have different views of the meaning of the concept of customer.

Then there are cultural differences. If a theatre production on Broadway bombs, this means that it was a flop. On the other hand, if a play in London's West End goes like a bomb, it is a great success. It is little wonder that George Bernard Shaw is attributed with saying, "England and America are two countries divided by a common language."[718] There is a similar situation in Scandinavia, where apparently the same words have different, even opposite meanings in Swedish, Danish, and Norwegian.

The issue of language is even more challenging when we come to integrate all knowledge into a coherent whole. For then we find that the many cultural and disciplinary conceptual maps in the world do not fit together at all. It is rather like taking maps of the different localities on Earth and trying to fit them together on the assumption that the Earth is flat. It simply does not work.

To address this critical issue, for the past couple of decades, I have been building a Glossary of terms, the most complete version being that in the *Wholeness* trilogy. I have begun the process of transferring the Glossary to the Alliance's website, updating it in the process. This version has the advantage of hyperlinks, showing the common ancestors of words and many of those that have evolved from common ancestors, like family trees. But I sure would appreciate some assistance with this task. For I have met many who are interested in understanding the roots of words, which are quite revelatory.

Such a coherent linguistic framework should then enable us to plan the production of the books and articles we need to publish the solution to the ultimate problem in human learning. As this solution is transcultural and transdisciplinary, it is a far greater publishing venture than that with which Newton, Darwin, and Einstein announced their discoveries. At its simplest, this solution can be expressed in just seven words: *Wholeness is the union of all opposites*, which is not derived from any other idea in the history of human learning. It is the seed from which all other ideas are formed, arising, as it does, directly from the Divine Origin of the Universe.

Once this is understood in the depth and breadth of being, nothing else is needed, as I've done my best to explain in this treatise. However, this book on *The Four Spheres* does not actually start at the very beginning. Rather, it is an attempt to help people towards the Alpha-Omega Point of evolution and involution within and on the Contextual Foundation of the Four Spheres. As such, I feel that with suitable editing it would be the most effective way of presenting the final revolution in science to the world.

On the face of it, this is a straightforward publishing project, requiring content and language editors, book designers, printers, marketing staff, and financiers in the normal manner. I trust that the skills and resources we need in this regard will be forthcoming at the beginning of 2016. But much more is needed than a single book.

In 1980, I remember standing in Foyles bookshop in Charing Cross Road in London saying to myself that many of the scientific, philosophical, and religious books that surrounded me on the bookshelves would need to be rewritten once we admit the paradoxical Principle of Duality into logic and the existence of psychospiritual energies into science. That is what I've spent the past thirty-five years in

doing, writing many hundreds of thousands of words, most of which are unpublished, even on the Web. For I find writing to be most therapeutic and great fun, healing my fragmented, split mind in Wholeness.

In order to assess how much of this writing is of relevance to others, what I really need is a literary executor, who could work with me while I am still in my body, not unlike the Peirce Edition Project,[719] sorting out Peirce's voluminous writings over the years, but on a much smaller scale. When viewed as a whole, all these writings represent the creative, evolutionary process I've been though since 1980. So anyone who is interested in such creative processes could perhaps benefit from reviewing all these writings. However, what might be of more benefit is to extract conclusions from these writings, rather than describe the strenuous thought processes that led to these results.

However, in this multimedia age, printed books are not necessarily the most effective means of communications. For myself, I have learnt much over the years from the many brilliant documentaries that the BBC and others have produced on discoveries in science and human history. Most significantly, as mentioned on page 125, it was David Attenborough's *Life on Earth* that first inspired me to investigate the root causes of the exponential rate of evolutionary change that we scientists and technologists are driving today. It is now time to update this television series, explaining to the people our entire evolutionary-involutionary history from Alpha to Omega and back again.

To this end, in 2006, following a meeting with Sondra Ray, cofounder of the rebirthing movement, I was inspired to draft the synopsis for a 13-part documentary series titled 'Our Evolutionary Story'. This synopsis now needs some updating as the result of the discoveries others and I have made since then, requiring even further revision once we have a team of producers, consultants, and directors in place. And no doubt it will require many millions of dollars to produce over a period of a couple of years. But all being well, maybe we could be ready to broadcast the series by 2018.

Another product that I have long thought about is an educational software tool that would make explicit the underlying structure of the Universe. After all, Integral Relational Logic emerged in consciousness as the result of a thought experiment in which I thought of myself as a computer designing the Internet and hence the Universe. So we could reverse this process of reversing Alan Turing's imitation game in computer software.

The Internet as a whole and Wikipedia in particular well demonstrate this underlying structure. And several conceptual modelling tools are available in the marketplace for use in designing systems and cognitive structures. But none of them as far as I can tell reveal the primal concepts on which IRL is built. There would be two inherent weaknesses in such a product. First, it is not possible to show in a machine how the underlying structure evolves from the Hidden Harmony, emerging directly from our Divine Source at the Origin of the Universe. Secondly, it is not easy to show the distinction between concepts and signifiers in the meaning triangle, for both require signs to denote them in computers. But no doubt some progress could be made.

Other skills that the Alliance will need are those of Web designers and programmers familiar with Drupal, the tool that my friend Pär recommended. In the short term, I would like to build on what Pär has done so far, tidying up some technical hitches and adding function as needed, not the least for people to join the Alliance and share experiences. But in the longer term, it might be better to redesign the website from scratch.

This brings us to the massive task of rebuilding the education and economic systems on the Truth. Regarding the former, the Alliance could have a role to play as a network of networking networks. For there are millions of individuals and hundreds of organizations engaged in questioning the assumptions

that underlie academia today. However, as we see from the diagram on page 169, these alternatives to the symbiotic, politico-business hegemony are highly fragmented. So if all these cultural creatives could see their unlearning and learning activities within and on the Contextual Foundation of the Four Spheres, then this coherent body of knowledge could spread into the mainstream education system, giving the next generations the opportunity to address the immense challenges they will face in their lifetimes.

Regarding the imminent collapse of the global economy, there is a theoretical solution to this problem. As money is a type of information, the modelling methods used by information systems architects in business provide a far more coherent picture of the dynamics of enterprises than financial modelling methods. So, with the active involvement of such companies as IBM and Oracle, we could, in principle, rebuild the global economy on the fifth pillar of wisdom, discarding the fifth pillar of unwisdom, on which the business world is run today. However, such technology companies have show little interest in understanding what is causing them to drive the pace of evolutionary change at exponential rates of acceleration.

In practice, we need to face the fact that money provides many with a precarious sense of security and identity in life. So a moneyless, information- and knowledge-rich economy in the Wisdom Society looks very remote indeed. This is by far the greatest stumbling block to humanity intelligently adapting to the Singularity in time that evolution is currently passing through. For if we don't all become mystics, free of the sense of a separate self, it will be virtually impossible to rebuild society in harmony with the fundamental laws of the Universe. Nevertheless, some are attempting to do so, such as Charles Eisenstein, with his popular books *The Ascent of Humanity* and *Sacred Economics: Money, Gift and Society in the Age of Transition*. So maybe there is still a chance that sanity could prevail.

For at the end of the day, any products and systems that the Alliance might develop are expressions of structures in our minds and consciousness. So, if we are to cocreate the necessary novelties of concrescence, this will require all members of the Alliance to be actively involved in the transformation of consciousness. We humans are the leading edge of evolution, not computers; we are the actual products of all evolutionary processes on our beautiful planet Earth.

The Alliance will recognize this fact, ensuring that all the work that we do together will be for the purpose of awakening Divine Love, Cosmic Consciousness, and Self-reflective Intelligence, unlike today's workplace. And, of course, there is no way of measuring such levels of happiness and well-being, even though social scientists might try to do so.

This leads to the final deliverables that the Alliance will need to produce. Who we know in life is far more important than what we know. So we need to find a way of helping people to get to know who this man Paul Hague really is, not just as a mystic living in solitude in the bliss of Wholeness, but also as a human being living in communion with others, dealing immediately with whatever emotions that might arise in dual and dualistic social intercourse.

In this regard, I am not at all sure who this man really is. Because I have lived for much of my life in solitude in cultures and subcultures that feel alien to me, I have kept my natural energies mostly hidden, even from my most closest friends. Furthermore, I am constantly changing. On this Saturday morning, as I write these words, I am in a quite different energy space from that which I experienced yesterday. That is the way in a Universe that is constantly vibrating with life.

Perhaps the best way of introducing myself to the world would be by being interviewed by a spiritual teacher interested in the interface of mysticism and science, posting the interview on YouTube. I did have an offer of such an interview at the beginning of this year, to be held in June. But the time was not right;

I needed to complete this book on *The Four Spheres* first. So maybe at the beginning of 2016, the time will be right.

I also don't know how many people might be interested in my story, which led to the ideas summarized in this book. To present these abstract ideas in as human a way as possible, I have described some of my story in its chapters. So that I, at least, understand this story, between 2000 and 2002, I wrote an autobiography titled *A Brief History of Me*, inspired by these words of George Bernard Shaw in *Maxims for Revolutionists*: "The reasonable man adapts himself to the world: the unreasonable man persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man."[720] In this autobiography, I viewed my life in four seasons, Autumn, Winter, Spring, and Summer, not unlike the way that Barry Long viewed his life, as he told us in one of his seminars in 1988.

This is somewhat different from the way that Jaques viewed the events in human life in Shakepeare's *As You Like It*, where he said, "All the world's a stage, And all the men and women merely players; They have their exits and their entrances; And one man in his time plays many parts, His acts being seven ages," the first six being infant, school-boy, lover, soldier, justice, and old age. Finally, "Is second childishness and mere oblivion, Sans teeth, sans eyes, sans taste, sans every thing."[721]

In a sense, Jaques is right, for, as Joseph Campbell showed, it is the purpose of life on Earth to return to the Nonmanifest before the death of our bodies—sans everything. Accordingly, in 2008, I wrote an addendum to the autobiography, then titled *Healing the Mind in Wholeness: A Brief History of Me*, describing how my ontogeny is a special case of the three-stage, seventeen-step spiritual journey, recapitulating the Cosmogonic Cycle.

However, as this book stands today, it is not really suitable for publication. What I would prefer, if this is meant to happen, is for a mystical psychologist to describe both my inner and outer journeys. For I am not sufficiently objective to describe my relationships with family, friends, and colleagues over the years, most of whom did not understand the overall purpose of my life in the context of society as a whole. For what is happening to humanity at the present time cannot be understood within the contextual framework of Western civilization.

Concluding reflections

Of course, in attempting to set up the Alliance for Mystical Pragmatics in order to complete the final revolution in science, I could be accused of trying to make myself more important than I am. In a sense, people are quite right to point this out to me. For when I go about my daily life, I feel quite ordinary, no different from anyone else, with very much the same foibles and idiosyncrasies. I have had a wealth of adventures and experiences during the past seventy-four years since my conception in August 1941. So I can empathize very well with almost anything that people might wish to share with me.

However, I am also utterly aware that Life has shown me how to use the abstract modelling methods that underlie the Internet to solve the ultimate problem in human learning, which has puzzled human beings for millennia. So while everybody's ontogeny is unique and many of us have similar experiential patterns, my own development is unprecedented in the history of human learning and hence evolution as a whole. Some people feel rather uncomfortable when they sense my awareness of my situation vis-à-vis society, not knowing how to relate to me—and I to them. As a consequence, they often respond with a fight-or-flight reaction to my overtures and presentations.

So, if this difficulty cannot be overcome, maybe we shall not be able to complete today's revolution in science, no matter how much we might wish it. For as Ramana Maharshi wrote to his mother, as 1898

turned into 1899, when she tried to persuade him to return home from Arunachala as a nineteen-year-old, "What is not meant to happen will not happen, however much you wish it. What is meant to happen will happen, no matter what you do to prevent it. This is certain. Therefore the best path is to remain silent."[722]

In the event, even Ramana did not manage this. There was just too much demand from spiritual seekers on how they too could become awakened or enlightened by realizing the extinction of the sense of a separate self for him to remain silent for long. So I feel that I must just follow my own natural energies day by day, trusting that the beautiful meetings I have with my friends from time to time will blossom into Heaven on Earth.

But, on the other hand, and there is always an other hand, it does not really matter whether the Alliance takes off or not. As an individual, the Hidden Harmony, Principle of Unity, and Cosmic Equation provide me with a deep sense of closure, in Kurt Koffka's meaning of this word in gestalt psychology in 1924,[723] defined by the OED as "the process whereby incomplete forms, situations, etc., are completed subjectively by the viewer or seem to complete themselves; the tendency to create ordered and satisfying wholes." Then, in 1970 in the USA, psychological closure was extended to mean,[724] "A sense of personal resolution; a feeling that an emotionally difficult experience has been conclusively settled or accepted", again in OED's definition. So I could die today feeling more than satisfied with my life's work.

That, in essence, is why I have written this book on *The Four Spheres*. It is so complete and all-embracing, providing answers to most of the fundamental questions of human existence that I have asked myself over the years, that it provides me with a wonderfully rewarding sense of closure at the end of time.

Nevertheless, nothing would please me more than to share this beautiful sense of closure with my fellow human beings, if this is meant to happen. For while our children and grandchildren could no doubt learn how to deal with the challenges they will meet in their lifetimes on their own, I feel that it is incumbent of us elders to do whatever we can do to help them stimulate the intelligence they will need to live happy and fulfilling lives in the eschatological Age of Light.

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This References section, formatted by Microsoft Word, will be split into Notes and Bibliography when this book is converted into Adobe InDesign or FrameMaker for professional book layout. At that point, subject and name indexes will also be added.

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