



Unifying Mysticism and Mathematics

By Starting Afresh at the Very Beginning



Paul Hague

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The image on the front cover is a symbol of Indra's Net of Jewels or Pearls in Huayan Buddhism, visualized as a dewy spider's web in which every dewdrop contains the reflection of the light emanating from all the other dewdrops, like nodes in a mathematical graph.

For humanity

Contents

This table of contents is very rough and ready at the moment, and will no doubt change as content and structure evolve together. The first two chapters—on mapping the workplace and the Cosmos—mostly contain writings from my earlier books and essays, revised to reflect my ever-deepening mystical experience.

However, the next three chapters on using Integral Relational Logic to map mathematics will contain much new material. They describe a holistic view of mathematics that I was seeking as an undergraduate in the early 1960s, which I have been working towards since 2012, as my seven unpublished books written since then indicate. However, while I need to correct some misconceptions in my most mathematical book on mapping evolution as a whole, I don't intend to re-present in this book the applied mathematics in that book, titled *Through Evolution's Accumulation Point: Towards Its Glorious Culmination*.

As one of the principal purposes of Integral Relational Logic is to show how evolution, as the creative power of Life, can enable us to realize our fullest potential as superintelligent superhuman beings, far above the capabilities of machines, the final chapter will address many misconceptions on the relationships of humans to algorithmic computers.

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Preface

To unify mysticism and mathematics, at the heart of science and spirituality, healing deep personal and cultural wounds in my psyche, I have needed to make radical changes to the way I was taught to view mathematics at university in the early 1960s, in the way I was taught to meditate in the late 1990s, and hence how I was taught to view God and the Universe in early childhood.

To explain this, we can best begin with Euclid's *Elements*, a standard mathematical textbook for hundreds of years until the end of the nineteenth century, as a model both of a three-dimensional rectilinear, orthogonal universe and of valid reasoning. However, at the beginning of the 1900s, Albert Einstein realized that he needed to use non-Euclidean geometry, systematically studied by Bernhard Riemann in the mid 1800s, to develop his general theory of relativity. As he wrote in the opening paragraph of his introductory book *Relativity* in 1920,

In your schooldays most of you who read this book made acquaintance with the noble building of Euclid's geometry, and you remember—perhaps with more respect than love—the magnificent structure, on the lofty staircase of which you were chased about for uncounted hours by conscientious teachers. By reason of your past experience, you would certainly regard everyone with disdain who should pronounce even the most out-of-the-way proposition of this science to be untrue. But perhaps this feeling of proud certainty would leave you immediately if some one were to ask you: “What, then, do you mean by the assertion that these propositions are true?” Let us proceed to give this question a little consideration.¹

However, Einstein did not question the linear structure of Euclid's reasoning, starting with some axioms or postulates, as self-evident or assumed truths, proving a sequence of theorems in a step-by-step manner, mostly related to geometric figures. This is a pity for this deductive way of reasoning is essentially mechanistic, like computers executing a sequence of instructions in algorithmic programs, albeit in parallel threads in modern multi-headed central processing units, collectively collaborating in networks, such as the Internet. But this is not how we humans think and organize our ideas.

So while Einstein spent the last thirty years of his life attempting to find a simple equation at the heart of his unified field theory,² he was unable to explain his creative process, described in a letter to Jaques Hadamard in 1945, who was then studying mathematicians' creative experiences:

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.

According to what has been said, the play with the mentioned elements is aimed to be analogous to certain logical connections one is searching for.

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In a stage when words intervene at all, they are, in my case, purely auditive, but they interfere only in a secondary stage as already mentioned.³

Indeed, no traditional method of scientific reasoning, whether it be deduction, induction, or abduction, introduced by Aristotle and Euclid,⁴ Francis Bacon,⁵ and Charles Sanders Peirce,⁶ respectively, can answer the most critical unanswered question in science: *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?*

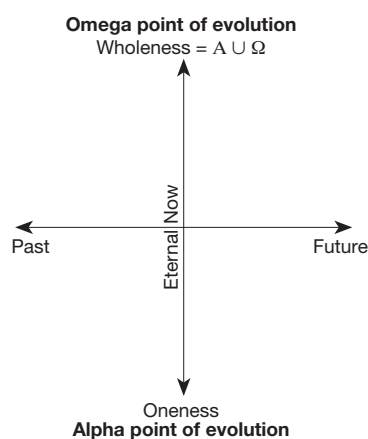
To answer this question, I have needed to develop a quite new system of thought that has evolved from the information systems modelling methods that underlie the Internet, which trace their origins to Plato's *Republic* and Aristotle's *Organon* and *Metaphysics*. This has enabled me to admit nonphysical, psychospiritual synergistic energies into science, unifying them with the four forces acknowledged by physicists: electromagnetic, gravitational, and the weak and strong nucleic forces. Indeed, a radically new way of thinking is not only necessary to solve many unsolved scientific problems.

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."⁷ 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."⁸

In my experience, just one simple step is needed to find Love and Inner Peace, as the Divine Essence we all share. Machines, like computers, function in the horizontal dimension of time of past and future. But to realize what it truly means to be a human being, in contrast to computers, I have needed to develop a system of reasoning in the vertical dimension of time, in the Eternal Now. For as Eckhart Tolle said in his best-selling *The Power of Now*,

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.⁹

Now traditionally, spiritual practices—such as Vipassana or Insight meditation in Buddhism or *Jñāna Yoga*, the path of wisdom and abstract knowledge in Advaita—follow the downward direction in the



vertical dimension of time. By repeating the mantra *neti neti* 'not this, not that', corresponding to *via negativa* in Christianity, we can discover our True Nature, Authentic Self, and Genuine Identity, answering the question, "Who am I?"

However, this is a one-sided approach to spiritual awakening. It does not take into account the upward movement in the vertical dimension of time, starting at the Divine Origin of the Universe, as the Ultimate Source of the creative power of Life. For evolution to become fully conscious of itself within me, enabling me to discover what causes me to think and behave as I do, free of my mechanistic, cultural conditioning, I have needed to unify both dimensions of time in all directions, as this diagram illustrates.

Unifying Mysticism and Mathematics

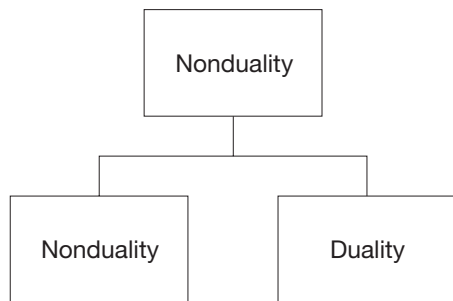
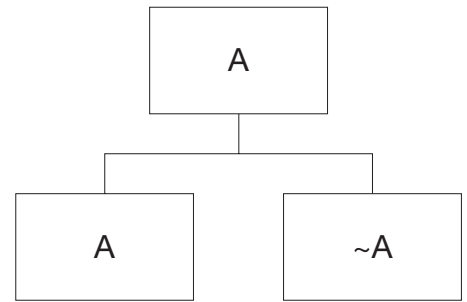
By starting afresh at the very beginning in an apocalyptic awakening in the spring of 1980, I have been carried from the Alpha Point of evolution to the Omega Point and back again. In other words, all the divergent streams of some fourteen billion years of evolutionary history have converged within me in a megasynthesis of all knowledge, not unlike the way that the scientific mystic Pierre Teilhard de Chardin prophesied in *Le phénomène humain*, posthumously published in 1955.



The two dimensions of time, which are inseparable, like two sides of a coin, are a special case of the fundamental law of the Universe, which I call the *Principle of Unity: Wholeness is the union of all opposites*. In the most abstract, I express this universal truth as a theorem in the notation of mathematical logic as the *Cosmic Equation*, where W is any whole, including Wholeness, A is any being, including the Supreme Being and all human beings, \cup is union, and \neg is not:

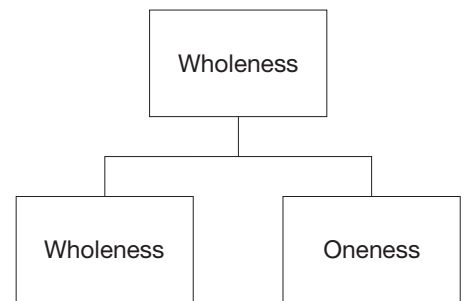
$$W = A = A \cup \neg A$$

The key point here is that this premise cannot be proven to be true from any other proposition. This universal truth emerges directly from the Divine Origin of the Universe in the Eternal Now. It is an irrefutable truth, for assertions and denials of its veracity confirm its authenticity. This diagram illustrates the primary-secondary relationship between these polar opposites. Nothing could be simpler. However, the Principle of Unity is not the Absolute Truth, which sets us free, as Jesus said.¹⁰ For the Truth is ineffable, only experienced and understood with the utmost profundity of mystical experience.



Another special case of this ubiquitous primary-secondary relationship is its application to the Totality of Existence, consisting of all beings, including the Supreme Being. One way of viewing and experiencing Totality is to see it as the union of the Formless Absolute and the relativistic world of form, the latter emerging from the former. This relationship is illustrated in this diagram, using the words *Nonduality* and *duality* to make the distinction.

However, the Absolute provides both the Cosmic Context and Gnostic Foundation for the world of form. So it too can be viewed as the union of transcendent and immanent opposites, which I call *Wholeness* and *Oneness*, respectively, illustrated here. What this means is that we all live in the same Universe, which is synonymous and coterminous with God, whether we know this or not, beyond all boundaries. Both *God* and *Universe* denote the Totality of Existence. God is everything and everything is God. No one can return Home to Wholeness because nobody has ever left Home.



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. Also, *tantra* derives from Sanskrit *tantram* ‘loom’, unifying ‘warp’ and ‘weft’, from *tan* ‘to stretch’, and *-tra-m* ‘instrument’. So *tantra* literally means ‘an instrument for stretching’.

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Figuratively, Tantra has the sense of weaving opposites together in Wholeness, with other original meanings indicating ‘groundwork, principle, system’ and ‘Context, Continuum’.



These five paragraphs, three diagrams, and one equation describe the keys that open the set of nested containers that enclose the innermost secrets of the Universe, revealing what it is, how it is designed, and how we humans are positioned within the overall scheme of things, not special in any way. Like all other beings in the relativistic world of form, we are born to die, as both individuals and as a species, or, in the case of mammals, birds, and reptiles, at least, are conceived to die.

Yet, in a way, we humans *are* special. We are the first beings in the entire history of evolution—seen from our particular position on Earth—to be given the ability to discover how the Cosmos, as an ordered whole, is designed. Meister Eckhart, the pre-eminent Christian mystic, explained how this incredible ability comes about, when he said, “The eye with which I see God is the same as that with which he sees me.”¹¹ I call this Divine eye Self-reflective Intelligence, sometimes called the Witness in spiritual circles, when the observer and observed and subject and object are one.

Self-reflective Intelligence is the eyesight of Consciousness, which provides the coherent light necessary for us to view the Cosmos holographically, as a self-similar whole, like a laser and geometric fractal. Our amazing ability to see ourselves seeing is the principal characteristic that distinguishes humans from the other animals and machines, like computers, with so-called artificial general intelligence. As Einstein described in his letter to Hadamard, much is implicitly happening in the psyche before our ability to explicitly express what we see with our inner eye in words and other signs, linguistic abilities often considered humankind’s distinguishing characteristic.

Anyone feeling into themselves wondering where their creative energies are coming from would have similar experiences. We cannot understand what it means to be a human being in terms of the laws of physics, such as the second law of thermodynamics, which Arthur Eddington regarded as irrefutable, writing:

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.¹²

Not that the irrefutable Cosmic Equation is a new idea. As this primal truth is ever-present, seekers of Love, Peace, and the Truth have uncovered it in a multitude of different guises over the years, most often not aware that they are doing so. One such awakened being was Heraclitus of Ephesus, who aptly called the Principle of Unity the *Hidden Harmony*, which has remained hidden from the mass of humanity for most of human history.

We can see why this is so from the root of *human*, which is Latin *humus* ‘ground, earth’, from the Proto-Indo-European (PIE) base **dhghem-* ‘earth’. This etymology shows that our forebears some 5,500 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*.¹³ So the split between humans and the Divine, as Reality, lies deep in the collective psyche. As a consequence, humans have become cognitively and experientially separate from our Immortal Ground of Being, which is the root cause of the existential fear of death and human suffering. To be humble, which derives from the same root, is therefore to deny our Divinity. Conversely, it is arrogant to realize and acknowledge our True Nature as Divine Beings, *arrogance* being the opposite of *humility*.



As a primary purpose of this book is to describe how unifying mysticism and mathematics has enabled evolution to heal my wounded psyche in Wholeness—sadly creating a split between society and myself—I don't want to dwell on these psychospiritual issues for more than is necessary. Human society, consisting of some seven-and-a-half billion souls, much influenced by our one hundred billion forebears, is the most complex structure in the world, going deep into the sub- and unconscious, far more complex than the brain.

All I need to say at this juncture is that human relationships are both complementary and contradictory in a multiplicity of different ways, reflecting the dual and dualistic nature of the Universe we live in. So to develop a comprehensive model of the psychodynamics of society, I have needed to include self-contradictions in my reasoning, showing that I can do so in an utterly valid manner. Indeed, as paradoxes are ubiquitous, if I were to omit them from my conceptual modelling and cognitive mapping, I would live in delusion, being led far astray. So in my reasoning, I follow E. F. Schumacher's fundamental maxim of mapmaking, "Accept everything; reject nothing."¹⁴

To reveal the simplicity underlying all this complexity, experience is primary. But just who is the experiencer? It might appear that Paul Hague, with unique social-security numbers in both the UK and Sweden for tax and other purposes, is the experiencer. It is pertinent to note that *Paul Hague* means someone living in or by a small field surrounded by hedges, from Latin *paulus* 'little, small' and Old Norse *hagi* 'an enclosed piece of land', also root of *hedge*. (In modern Swedish and Norwegian, *hage* means 'meadow' and 'garden', respectively.) But if I had lived my life constrained by my name, inherited from my parents, I would not have been able to discover the innermost secrets of the Universe, which has been the central theme of my life since I was seven years of age.

So to understand what it truly means to be human, in contrast to computers, I have demolished all the hedges that demarcate specialist fields of learning so that only the Field remains, a notion that some physicists are adopting to explain their observations. The systems philosopher Ervin Laszlo calls the Universal Quantum Field *Akasha*,¹⁵ corresponding to Greek *Æther*, the fifth element, from which we get *quintessence* via Latin.

Over the years, I have thus learnt to stand outside myself, beyond the boundaries of my body-mind-soul organism. I have not been able to understand what is causing scientists and technologists, like myself, to drive the pace of change in society at exponential rates of acceleration from an anthropocentric perspective. I am not a human being having a mystical experience. Rather, I am a Divine Cosmic being having a human experience. My body-mind-soul organism emerges from Consciousness, not the other way round.

Today, I know this truth with absolute certainty, having changed the meanings of *God* and *Universe*, as they were taught to me in childhood. So, in my seventies, I do not need to prove it through any process of reasoning or spiritual practice. The exquisite experience of Stillness and Presence tells me everything I need to know, faced with the sixth mass extinction of species on Earth, including, inevitably *Homo sapiens*. For *Presence* means 'before being' or 'prior to existence', deriving from Latin *praesentia* 'presence', participle of *praesse* 'to be before', from *prae* 'before' and *esse* 'to be'. So the word *Presence* indicates that the Absolute is the Supreme Cause of Everything there is, both immanent and transcendent.

However, as a seven-year-old, I was very confused by the words *God* and *Universe*, which provide the overall context for religion and science, respectively. As a consequence, without a single Cosmic Context for interpreting what I was taught at school and university, I learned almost nothing during my formal

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education. I did not have any means to confirm the truth of what I was being taught in my own experience.

Today, I call this inner knowing of the Divine *Gnosis*, distinct from symbolic or signate knowledge. *Gnosis* never changes. It is completely independent of how I might feel at any one moment or of what people might think or say, including myself. Indeed, in the Gnostic experience, there is no experiencer as a separate being.

Therein lies the greatest paradox in my life. As I am Wholeness, like everyone else, there is nothing and nobody outside me. I am not separate from anybody. Yet, I have lived most of my life in solitude, increasingly aware that my life experiences are quite different from those who learned what their parents and teachers wanted them to learn as children. Indeed, my experiences are so unusual that the existing meanings of words do not enable me to satisfactorily communicate what I feel and see within me.

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*, bringing in words from the East when necessary to fill gaps in Western understanding. For the root of *etymology* is Greek *etimos* 'real, true'. So by studying etymology we discover that our forebears were much closer to Reality than most people are today, the exceptions mostly being those brought up in Eastern mystical traditions.

As a consequence of the deep wound in the Western psyche, many of those who have considered the Big Questions of human existence over the centuries have said that my life experiences are impossible, that we humans will never discover what the Universe is and how it is designed. Yet, paradoxically, when I *do* use words that people are familiar with, they sometimes say that I am not saying anything new. In a way this is true. I am Wholeness, awarely (consciously and intelligently) living at the Immortal Omega Point of evolution, co-existent with its Alpha Point, from which none of us is ever separate.



So how are you and I to relate to each other as ordinary human beings? This is a question I have been wrestling with for most of my life, particularly after my life-changing epiphany in 1980. What is most similar in my experience to that of others is that which is expressed in the ancient wisdom of the mystics, which many millions sense within themselves today. These profound truths were known to Gottfried Leibniz and Isaac Newton as *philosophia perennis*¹⁶ and *prisca sapientia*,¹⁷ respectively, the co-discoverers of the infinitesimal calculus in the mid 1600s.¹⁸ So one way of describing what has happened to me in my lifetime is to communicate this ancient wisdom in a language that has evolved from the universal language of mathematics, as the emerging, generative science of patterns and relationships.

However, there is a difference. The differential calculus is the branch of mathematics that studies change. In particular, Newton showed with his equation $f = ma$ that for a body in motion to accelerate a force needs to be applied to it. Now the pace of change in society is accelerating exponentially. As John Templeton said in 2000, "More than half the scientists who ever lived are alive today. More than half of the discoveries in the natural sciences have been made from 1900 to 1999. ... More new books are published each month than were written in the entire historical period before the birth of Columbus." He was then naturally led to ask the question, "Is the slow progress of prehistoric ages now speeding up?"¹⁹

Fairly obviously it is. But, as society is not a lump of matter, what is accelerating and what is causing the pace of scientific discovery and technological innovation to accelerate at unprecedented rates of evolution? And how can we study the psychodynamics of our rapidly changing society mathematically? Could we develop the laws of motion of society just as Newton developed the laws of motion of physical

bodies, since modified by Einstein's special and general theories of relativity and the paradoxical discoveries of quantum physics.²⁰

Well, as I have realized from half a lifetime of study, evolution is an accumulative process of ever-increasing complexity of structure, consisting of the meaningful relationships between forms, whether these be physical or nonphysical. So we could in principle use algebra, as the branch of mathematics that studies relationships, the logic of relatives, and the exponential function to map our rapidly changing society.

However, in themselves, these are not sufficient. For if they were, scientists would long ago have answered the most critical unanswered question in science. As synergistic energies within us scientists and technologists are causing us to drive the pace of change exponentially, to understand why we are behaving in this ignorant way we need to engage in self-inquiry, conducting an experiment in learning to map our minds and psyches, requiring us to make a radical change to scientific method. For fairly obviously, we can only understand what is happening to us all as a species by changing the way that we learn about ourselves and our relationships to God and the Universe. Scientific methods that have been developed to study outer space are quite inappropriate to study inner space.

Of course, if I had known the Truth in the way I do today earlier in life, I would not have needed to write this book on how mysticism and mathematics have converged within me. Although I have been on an unprecedented spiritual journey, there are some similarities between my reasoning and that of Baruch Spinoza.

In 1677, Spinoza similarly sought to show the equivalence of God and the Universe in *The Ethics* through a systematic process of reasoning, inspired by Euclid's deductive *Elements*. So he began with some definitions and axioms and proceeded to 'prove' a sequence of propositions or theorems, beginning with the substance and essence of God and continuing to study the origin and nature of the mind and emotions, before exploring what this means for human behaviour, free of bondage to the emotions.



Since then, mathematics has moved on in great leaps and bounds, looking quite different from Spinoza's time. The *Oxford Dictionary of English*, the default dictionary of British English on my iMac and iPad, defines *mathematics* as 'the abstract science of number, quantity, and space, either as abstract concepts (pure mathematics), or as applied to other disciplines such as physics and engineering (applied mathematics)'. Other dictionaries give rather more elaborate definitions of this academic discipline. Nevertheless, I feel that this definition on Apple's computers well encapsulates the general public's conventional conception of mathematics, as many of us experience it up to high school.

However, in the nineteenth century, mathematicians began to extend the subject beyond the arithmetic, algebra, calculus, trigonometry, and geometry we learned in school, discovering that the patterns and relationships between numbers could be generalized, applying these rules to numerical and nonnumerical constructs, such as matrices, polynomials, and groups. So numerical algebra, tracing its origins to the Babylonians, became universal, abstract, and modern algebra, sometimes simply called *algebra* by professional mathematicians.

An early book on the subject was *A Treatise on Universal Algebra*, which Alfred North Whitehead wrote in the late 1890s, later to spend twenty years with Bertrand Russell writing *Principia Mathematica*, taking 360 pages to prove the proposition ' $1 + 1 = 2$ '.²¹ In this early treatise on a general theory of symbolic reasoning, Whitehead used William Rowan Hamilton's Quaternions, Hermann Grassmann's Calculus of

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Extension, and George Boole's Symbolic Logic as the chief examples of the various systems of Symbolic Reasoning allied to ordinary Algebra.

For myself, I first came across abstract algebra as an undergraduate in the early 1960s, having *A Survey of Modern Algebra* by Garrett Birkhoff and Saunders Mac Lane as a standard textbook on the subject, going through four editions from 1941 to 1977. They then went on to write another standard, simply titled *Algebra*, published in three editions from 1967 to 1999. This latter book provides a comprehensive overview of the basic constructs of groups, rings, and fields, extended into the categories of modules, vector spaces, linear algebra, matrices, lattices, and Galois theory.

A chapter at the end of the book covers category theory in mathematics, a subject that Mac Lane cofounded with Samuel Eilenberg. Mac Lane's standard textbook on mathematical categories, based on the concept of functor, is titled *Categories for the Working Mathematician*, published in 1969 and 1998. As such categories apply just as much to computer science, Andrea Asperti and Giuseppe Longo then went on to write *Categories, Types, and Structure: An Introduction to Category Theory for the Working Computer Scientist*, published in 1991.

However, categories don't just belong to mathematics and computer science. The whole of human learning is concerned with the classification of human experience, which is how we bring a sense of order to our conceptual models and cognitive maps. The branch of science concerned with classification is called *taxonomy*, 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 the household. Similarly, *taxonomy* is an arrangement of an arrangement, today either meaning classification in general or specifically the systematic classification of biological organisms, following Carl Linnæus from Sweden, who published his seminal *Systema Naturæ* in 1735.²²



To develop a quite fresh approach to category theory, this book describes how the Logos, the "immanent conception of divine intelligence" signifying "the rational principle governing the cosmos", as Richard Tarnas interpreted Heraclitus' use of *Logos*,²³ has brought universal order to all my thoughts. However, as most people prefer to think in the concrete terms of particulars, with specific reference to their own separate lives, it might seem that nothing very interesting could emerge from thinking in this utterly abstract manner, standing outside ourselves to watch our behaviour patterns, including reasoning, and hence mapping the psychodynamics of the whole of society.

This was the view that G. H. Hardy and A. N. Whitehead took when writing about their experiences as pure mathematicians. For instance, Hardy, as a mathematical analyst, 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."²⁴ Hardy called pure mathematics 'serious' rather than 'trivial'.²⁵ To Hardy, "A mathematician, like a painter or a poet, is a maker of patterns."²⁶ "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."²⁷ Hardy was "interested in mathematics only as a creative art".²⁸ In the words of Whitehead, "The science of Pure Mathematics ... may claim to be the most original creation of the human spirit," one possible rival being music.²⁹

In Hardy's words, there is "a certain generality and a certain depth"³⁰ in pure mathematics. By

generality, he meant “A significant mathematical idea ... should be one which is a constituent in many mathematical constructs.”³¹ 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”,³² which are quite irrelevant. It is the task of mathematics to discover a “pattern of relationships among general abstract conditions”.³³ 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.”³⁴ As Hardy said, “a property common to too many objects can hardly be very exciting.”³⁵

By depth, Hardy meant “ideas that are usually the harder to grasp”.³⁶ 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.”³⁷

However, it is not true that a property common to too many objects can hardly be very exciting, as this book demonstrates. The most abstract concept is that of Aristotle’s ontological concept of Being, defined in *Metaphysics* as more general than mathematical concepts, like number, circle, and set.

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.³⁸

However, in the same book, Aristotle said, “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,”³⁹ a statement known today as the Law of Contradiction, the implicit axiom for deductive logic and mathematical proof. By denying the irrefutable truth of the Hidden Harmony, Aristotle thus took Western thought into the evolutionary cul-de-sac it finds itself in today.



As I can see in hindsight, the story of my entire life has been to extricate myself from this evolutionary dead end, often coming into conflict with my peers and the authorities in my life, holding on to fragmentary approaches to human learning in academic specialization and the division of labour in the workplace. But we should not blame Aristotle for the mess the world is in today. Most have fragmented minds because human learning has been more divergent than convergent during the thousands of years of human cognitive evolution. So the Law of Contradiction simply reflects the way that many maintain a precarious sense of identity and security in the world, viewing both God and others as separate beings.

For myself, I began to free myself from the constraints of Western thought as an undergraduate in the early 1960s, majoring in mathematics, being attracted to two topics that I later built on: the principle of duality in projective geometry and group theory in abstract algebra. I cannot say that I mastered these branches of mathematics at the time because I was too depressed by my inability to end the long-running war between science and religion, which I had been struggling with since I was seven years old in 1949.

As I can see now, I was seeking to find Love and Inner Peace by healing a deep wound in my psyche, partially introjected from the culture I was born in, opened up as the result of a cataclysmic trauma seven weeks after my conception in October 1941. Gone was the feeling of what Stanislav Grof calls ‘oceanic ecstasy’ in *The Holotropic Mind*.⁴⁰ As he says, our early experiences in the womb “have strong mystical overtones; they feel sacred or holy. ... In this state of cosmic unity, we feel that we have direct, immediate,

and unlimited access to knowledge and wisdom of universal significance.” This rapturous period in our lives is a reminder of “Gardens of Paradise in the mythologies of a variety of the world’s cultures”.⁴¹

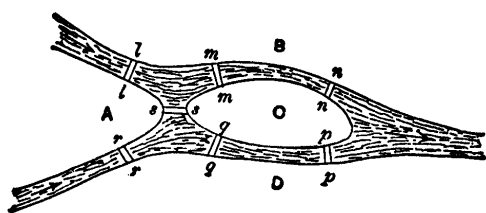
In contrast, when prenatates experience a deep trauma before birth, as I did, they experience what Stan calls a ‘bad womb’,⁴² which can have an even greater effect on later development than what he calls ‘basic perinatal matrices’ (BPM).⁴³ This trauma set up a pair of behaviour patterns in my psyche, which led me, as soon as I was able, to question the beliefs and assumptions of the culture I was born in, creating what appeared to be a hostile environment. It was vitally important to learn as little as possible during my formal education in order to heal this personal wound, and hence cultural wound, during the second half of my life. So as soon as I learned too much, Life arranged for me to have a major breakdown.

As neither people educated in the culture I was born in nor specialists in inner science could help me to heal this deep wound in my personal psyche, I have needed to live outside society for most of my life. In later years, I have used the model of the psychodynamics of society that has been revealed to me to help with this healing process, much helped by the beautiful patterns in mathematics. For to avoid feeling too depressed and frustrated by what has often appeared to be a hostile social environment, constantly ignoring and rejecting my adventurous life of learning, I have sometimes turned to the elegance of pure mathematics for solace, with its universal abstract notions applicable in all cultures.



In the second half of my life, I have been able to build on what little I had learnt in the early 1960s as an undergraduate. The seeds that were then planted in my subconscious have now grown into a majestic structure of incomparable power and beauty. To explain this, I can best begin with a book that I was given as a school mathematics prize as a sixteen-year-old: *Mathematical Recreations and Essays* by W. W. Rouse Ball, revised in later editions by H. S. M. Coxeter, a foremost geometer in the twentieth century.

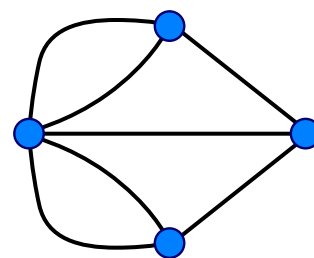
In this book, Rouse Ball tells us that Leonhard Euler presented a memoir to the St Petersburg Academy in 1736 concerning a problem relating to the bridges of Königsberg, the capital of East Prussia, today Kaliningrad, a Russian exclave. This pre-eminent Swiss mathematician was asked if it were possible to take a walk in Königsberg, the birthplace of Immanuel Kant and David Hilbert, in such a way as to cross every bridge in it once and only once and return to the starting point.⁴⁴



way round, with the node on the left being the island.⁴⁵

With such a diagram, Euler showed that as each node has an odd number of arcs connected to it, it is not possible to cross every bridge only once. This would be possible if all the nodes except two were even. In that case, it would be possible to start at one of the odd nodes and finish at the other. If all nodes were even, it would be possible to traverse all bridges by starting at any node.

Today, such a structure is called a mathematical graph, which is ubiquitous, appearing in every branch of human learning, not the least in mathematics—in category theory and the symmetries of group theory and topology, for instance—and in computer science. For myself, I have taken these abstractions of pure mathematics to their utmost level of generality in order to heal my



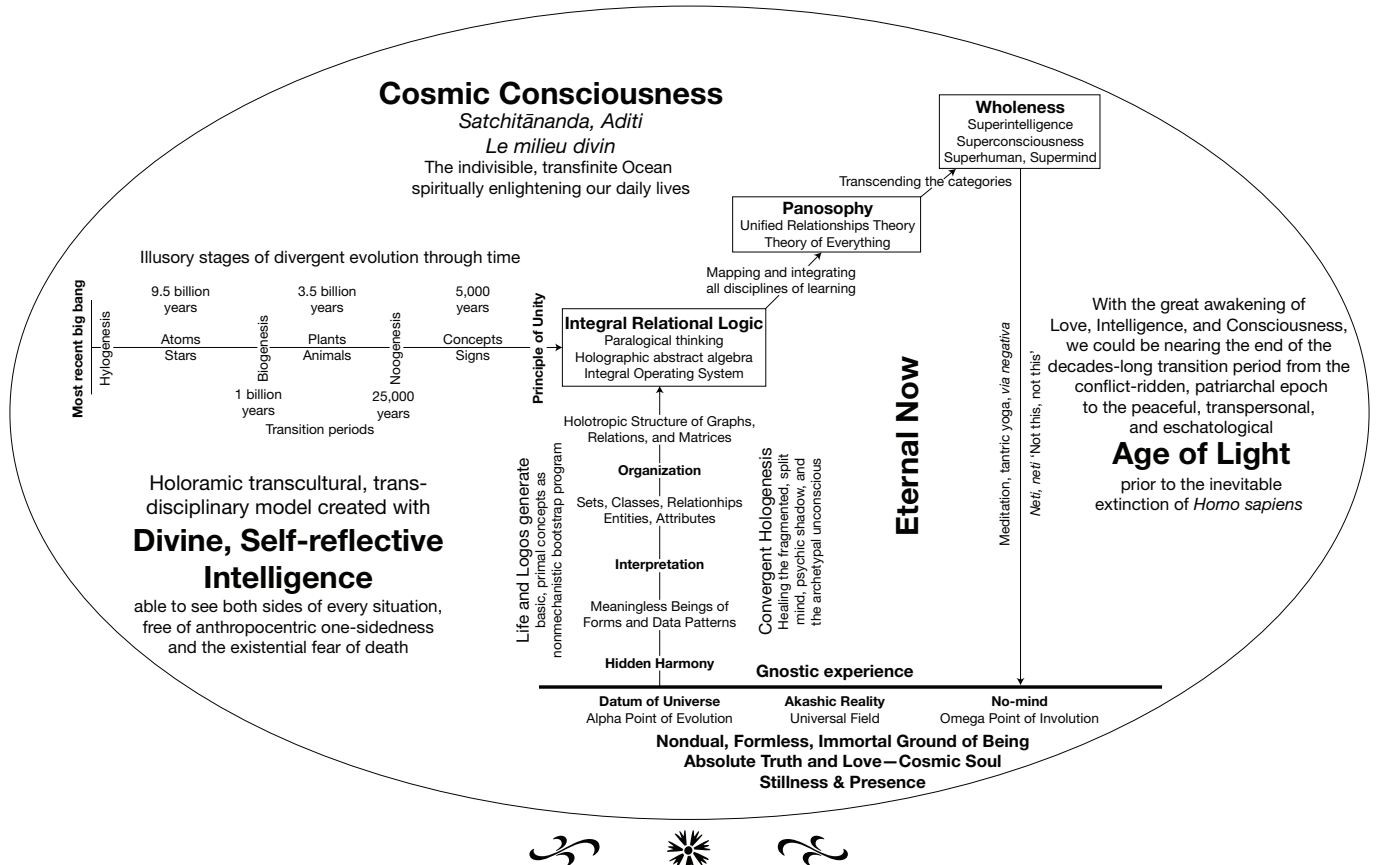
Unifying Mysticism and Mathematics

fragmented, split mind in Wholeness. The creative power of Life and the Logos has thus showed me how to construct a self-inclusive map of the entire Cosmos and hence a comprehensive conceptual model of all evolutionary processes, whether they be material, biological, or mental, and the psychodynamics of society.

The mathematical graph is the basis of my meditation practice. First, I view Euler’s abstraction of the bridges of Königsberg as a structure, consisting of forms and the meaningful relationships between them, as in a semantic network. I then view each node as a structure, consisting of a deeper level of forms and relationships. Continuing, these forms, as structures, disappear at deeper and deeper levels and I am just left with relationships between singularities, as points. Eventually, even these disappear through the practice of *neti neti*, and I reach the Origin of the Universe, as Oneness.

Conversely, any one structure is a node in a higher-level structure of forms and relationships. Eventually, these creatively expand to such an extent that they become a seamless continuum with no borders or divisions anywhere, which I call Wholeness. It is in this way that my individual consciousness expands and deepens to such an extent that it becomes coterminous with Consciousness itself, as the union of Cosmic and Unity Consciousness, which etymologically means ‘knowing together’.

As the body-mind-soul organism writing these words is a node in such a mathematical graph, he too disappears as a separate being, enabling me to draw this diagram, showing the Cosmic Context, Gnostic Foundation, and coordinating framework of the Grand Design of the Universe, revealed by evolution becoming fully conscious of itself.



The line on the left of this diagram shows the conventional view of evolution in the horizontal dimension of time, extended from the biological into Teilhard’s first three stages in his four-stage evolutionary model, following his law of complexity-consciousness, the greater the complexity the greater the consciousness. My book *Through Evolution’s Accumulation Point: Towards Its Glorious Culmination* shows how we can apply the logistic map in nonlinear systems dynamics to mathematically model evolution under constraint, showing why the fourteen billion years of evolution are accelerating

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exponentially into chaos right now, with a few oases of self-similar order amongst the turmoil. So there is no need to dwell on this evolutionary model any further in this book.

Conversely, during the last three or four millennia, mystics and spiritual seekers have written countless words to describe their experiences, as they have come ever closer to the Divine. Viewed as a whole, the literature is pretty confusing, as people use different words to describe what is essentially the same experience and similar words to describe what might be dissimilar psychic phenomena. While a rose is a rose in our outside world, the languages we use to describe our inner worlds are in much disarray.

So to heal the deep wound in the cultural and collective psyche between mysticism and mathematics, and hence science and spirituality, this book focuses attention on the upward path in the centre of this diagram. It thus unifies the traditional scientific and spiritual paths with a coherent language defined in an evolving Glossary of terms on one of my websites.

It is vitally important to note that unifying these opposites is not speculative philosophy, as an intellectual pursuit, not explicitly grounded in experience. Bertrand Russell described philosophy as lying in the No-Man's Land between the warring factions of science and theology,⁴⁶ using a metaphor from the First World War, which so appalled him as a pacifist. A recent example of this conflict is *War of the Worldviews: Science vs. Spirituality*, by Deepak Chopra, a medical practitioner and renowned spiritual teacher, and Leonard Mlodinow, co-author with Stephen Hawking of *The Grand Design*, who are clearly not aware of the primary-secondary relationship between Reality and what most call reality.

For 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 and mathematicians through the ages with sound Self-reflective Intelligence, mystical experience, and rational thought.

Those with a philosophical bent of mind might attempt to apply terms from philosophy to denote the all-inclusive worldview presented in this book, contrasting it with other philosophical schools of thought. But in so doing, Panosophy would no longer be all-inclusive. For instance, following the so-called Age of Enlightenment or Reason in the 1700s, in the next century philosophers coined the words *idealism*, *realism*, *nominalism*, and *conceptualism* to denote competing views of how to view the Universe. Robert H. Dicke and James P. Wittke clearly stated the distinction between realism and idealism in a classic textbook on quantum physics in 1960:

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).⁴⁷

We can resolve the split between realism and idealism when we view the Totality of both our outer and inner worlds as a gigantic information system, as some scientists are doing today. For scientists do not just observe the actions of chemicals or sub-atomic particles in their laboratories or the behaviour of animals and galaxies in the wild, for instance. Rather, what they observe is data, interpreted as information and knowledge in conceptual models and cognitive maps in the psyche.

In this way, we can overturn the conventional scientific view that the territory exists before the map. 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."⁴⁸ 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.”⁴⁹ Our minds create our reality, most evident in the complex structure called *Universe*, from Latin *ūniversus* ‘whole, entire’, from *ūnus* ‘one’, and *versus*, past participle of *vertere* ‘to turn’.

So once we can see that Consciousness is Ultimate Reality, we don’t actually need any of these isms, which Satish Kumar, long the editor of the ecological and spiritual magazine *Resurgence*, jocularly called ‘wasms’ in a talk in the early noughties. For what appears to be real, from Latin *res* ‘thing’, is nothing but waves and ripples on the surface of the Ocean of Consciousness, called *māyā* ‘deception, illusion, appearance’ in Sanskrit. If we include the currents beneath the surface, everything that happens in the relativistic world of form is *līlā* ‘play’, the delightful play of the Divine in the manifest world. Our minds thus create an illusory sense of reality, vitally important to know at these end times of the patriarchal epoch we live in, with its twenty-odd war-mongering civilizations.

We also don’t need words like *theism*, *monotheism*, *polytheism*, *deism*, *pantheism*, and *panentheism*, illustrating the immense confusion that humans have been in over the millennia about the relationship between humanity and Divinity. As God is everything and everything is God, we can resolve this confusion with the words *Gnosticism* and *Mysticism*, which it seems are unavoidable isms, resolving in direct experience the philosophies of pantheism and panentheism, which are closest to Immanent and Transcendent Panosophy. Theists and atheists are people who believe and don’t believe in the existence of God, and agnostics don’t know what to believe. On the other hand, Gnostics do not need to believe, because they know God in their direct experience.

In terms of mathematics itself, Morris Kline tells us in *Mathematics: The Loss of Certainty* that there have been four approaches to giving mathematics a sound foundation after paradoxes were found in the foundations: logicism, intuitionism, formalist, and set-theoretic. I have not studied these very much because the Principle of Unity emerging directly from the Divine Origin of the Universe guides all my reasoning, establishing my learning on Absolute Certainty. I have thus been led to give mathematics and the whole of human learning a sound foundation in harmony with the fundamental law of the Universe: the Hidden Harmony.



Given this brief overview of the current state of the world of learning as it has evolved during the last few centuries and millennia, who is this book on *Unifying Mysticism and Mathematics* for? Well, one purpose of this book is to find a sense of closure with my forty-year writing career, seeking to explain the root causes of evolutionary change and conflict and suffering in the world. It is thus intended as the last of a series of books and treatises I have written during the last ten years on how we could use the Principle of Unity to end the long-running war between science and religion and those between all the religions, rebuilding the entire world of leaning on the Truth.

Sadly, these nine books and treatises—three of which form a trilogy titled *Wholeness*—are mostly unread and therefore unpublished because healing this deep cultural wound is essentially experiential, not intellectual, which cannot happen within the context of any particular civilization, religion, discipline, or ideology. So, for the most part, scientists and technologists are driving the pace of change in society at unprecedented exponential rates of acceleration with almost no one knowing why this is so.

To overcome these psychospiritual limitations, for over thirty years I have been attempting to cocreate a life-enhancing, nurturing social environment where it is safe to question the fundamental beliefs and assumptions of the cultures we live in. For, as J. Krishnamurti, David Bohm, and Vimala Thakar have said, if we do not engage in such questioning then humankind is not a viable species. However, while

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there has been some interest in this initiative, whose latest manifestation is the Alliance for Mystical Pragmatics, it appears to be still-born, unlikely to be resuscitated. For those who present at and attend conferences like Mystics and Scientists and Science and Nonduality in the UK and USA, respectively, have shown little sign in joining me in this epoch-making endeavour.

This brings me to another central issue. For many years, I visualized a gap of a few generations between the deaths of dysfunctional Western civilization and *Homo sapiens*, faced with a multitude of existential threats to our well-being and survival as a species, some of which arise from discoveries in science and technology. However, this epoch, which I have been calling the Age of Light and the Mystical Society, has become shorter and shorter in my vision during the last few years, especially since I read *Extinction Dialogs: How to Live with Death in Mind*, which Andrew Harvey asked Guy McPherson and Carolyn Baker to write in 2014.

In December 2017, I met Guy, Professor Emeritus of Natural Resources at the University of Arizona, in Oslo. He explained to me why the collapse of the industrial economy, apparently our salvation, would reduce global dimming, accelerating the extremes of climate change, making our beautiful planet Earth uninhabitable, unable to provide us with the food we need to survive. Since then, Guy has moved on with his prognostications saying that the Arctic is projected to be free of ice in the summer of 2018 or 2019. As this is likely to accelerate the release of methane gas, far more damaging than carbon dioxide, he has thereby predicted that we are about to experience abrupt climate change, no longer able to grow the corn we need to bake our bread, a standard nutriment for thousands of years, even saying so on a television channel in New Zealand in 2018.

For myself, I am nearly seventy-six years young, three and four years younger than my parents were when they died. So even though I may be healthy enough to live well into my eighties, it would appear that the death of my body is likely to coincide with the extinction of *Homo sapiens*, just like the younger generations, whose lives would normally be ahead of them. The vision that I have had that the harmonious, androgynous, peace-loving Age of Light could last for a couple of centuries following the collapse of the global economy is no longer viable. My life's purpose to complete the final revolution in science, just as Isaac Newton completed the first in 1687 with *Mathematical Principles of Natural Philosophy*, is unlikely to be fulfilled in the collective.



So what to do during the few remaining years of my life on Earth? Well, while I am Wholeness, living in the Eternal Now, with nobody and nothing outside me, there is one last unfulfilled task that has been on a back-burner for many years. Recognizing that mathematics is not based on the Truth, dispersing the misconceptions underlying mathematics would give me immense satisfaction. That, essentially, is why I feel moved to write this book during the next year or two, for as long as I have the energy to do so.

But rather than explicitly starting afresh at the logical beginning, at the Divine Origin of the Universe, the first chapter starts where the fourteen-billion-year history of evolution had reached in the 1970s, at the birth of the Information Society.⁵⁰ For this event marked the greatest revolution in human learning since our forebears began to pick up pieces of stone to make cutting tools with pieces of flint. 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.*

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So Chapter 1 begins in the workplace, outlining the business management and modelling problems that arise from the invention of the stored-program computer in the late 1940s. My interest in this central issue of our times began in January 1974, when I was appointed the systems engineering manager responsible for ensuring that the first computer that the British Post Office (now British Telecom) had bought from IBM passed its acceptance test. This computer system led me to study the way that humans interact with computers in timesharing systems, not easy to model in the business modelling methods of information systems architects, which are far beyond the financial modelling methods of accountants, economists, and bankers.

This first chapter thus outlines the way that resolving this business management problem has led me to develop a comprehensive model of the psychodynamics of society, exploring how we humans communicate with each other—including our self-reflective selves. This is the immediate background to the apocalyptic awakening I went through in the spring of 1980, as I realized that data patterns in humans and computers are synergistically energetic and causal.

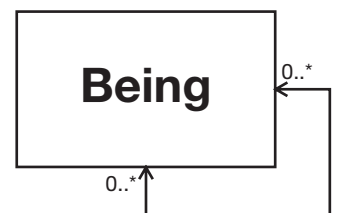
So the second chapter in this book on Integral Relational Logic is actually the first, for this describes how evolution has carried me from its Alpha to its Omega Point. However, rather than explicitly starting with the fundamental law of the Universe, I begin with the primal concepts by which Life has shown me how to lift myself up by my bootstraps, corresponding to the bootstrap program in computers. In the event, it took nearly thirty years before I saw and felt this way of presenting the art and science of consciousness that we all intuitively use to form concepts and organize our ideas in mathematical relations and graphs.

We then come to the main theme of this book, showing how to use the taxonomic facilities of Integral Relational Logic to map mathematics, not as an axiomatic, linear proof system, but as a generative science of patterns and relationships, emerging directly from the Divine Origin of the Universe.

Chapter 4 begins with the concept of number, showing how this grows in kind and from simplicity to the infinity of infinities. This leads naturally to the fascinating subject of sequences and series, much studied by Euler and many mathematicians since. Then the fifth chapter shows how numerical relationships have become generalized in abstract algebra. At the time of writing this draft of the Preface in May 2018, the content and structure of these chapters is rather hazy, requiring a great deal of additional research to clarify the intuitive understanding that I have at the moment.

The sixth chapter outlines how we humans could rise above the level of machines, realizing our fullest potential as human beings. By using Integral Relational Logic to map deep learning and quantum computation, we can demonstrate the limitations of these techniques, perhaps stimulating scientists and mathematicians to look inside themselves to discover the root cause of their thinking and behaviour patterns.

We have now come full circle, for these mathematical constructs have been carried to the utmost level of abstraction and generality in Aristotle's ontological concept of being, depicted in this simple map of the Totality of Existence in the notation of the Unified Modeling Language, developed at Rational Software in the 1990s, now owned by IBM, my former employer.



This book thus presents the algebra of algebras with which David Bohm sought to show how his theory of the Implicate order unifies quantum and relativity theories in Wholeness in a thoroughly rational manner.⁵¹ It thus provides an expression of the solution to the ultimate problem of human learning, much sought for over the centuries and millennia.