Our Human Story

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Abstract. This essay is a summary of forty years of profound, introspective research into our human story, from birth to death, answering questions that I first posed thirty years earlier as a seven-year-old, when I set out to end the long-running war between dogmatic science and religion, essential for World Peace.

Although this essay begins with the invention of the stored-program computer, the story actually begins tens of thousands of years ago, when our forebears were given the Divine gift of Self-reflective Intelligence, which distinguishes humans from the other animals and machines aspiring to be superhuman with so-called artificial general intelligence.

Even though there is a great awakening of human intelligence spreading around the world today, this Awareness does not allow us to disobey the fundamental law of the Universe, lying hidden in the utmost depths of the collective unconscious: *Wholeness is the union of all opposites*.

A particular case of this irrefutable, universal truth is that *Homo sapiens* is not immortal. As both individuals and as a species we are born to die. So one day, a generation of children will be born who will not grow old enough to have children of their own, requiring us to find a quite new story for humanity.

But before our human story comes to its inevitable, climactic conclusion, we have a tiny window of opportunity to complete the final revolution in science, recognizing that Consciousness is all there is and that none of us is ever separate from any other being, including the Supreme Being, for an instant.

If the creative power of Life emanating directly from the Divine Origin of the Universe could bring this miracle about, we still have a few years to collectively make the transition from the conflict-ridden darkness of the patriarchal epoch into the harmonious Age of Light, realizing that the Divine Essence that we all share is Love.

On 6th May 1949, at Cambridge University, the first practical stored-program computer, called the EDSAC (Electronic Delay Storage Automatic Calculator), ran its first program to compute a table of squares from 0 to 99 and print the results.[1] Following a few staggering steps earlier in the decade, computers were ready to start 'learning'; the Computer Age was truly born.

This invention marked the most radical turning point in the history of human learning and technological development. 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*.

Yet the psychological and economic implications of society's growing dependency on information technology have not been fully investigated. Science continues to be guided by its materialistic, mechanistic paradigm in the false belief that the physical universe, accessible through our five external senses, is the Universe—the Totality of Existence. And the global economy continues to be money-driven, even though Daniel Bell, who coined the term 'Information Society', pointed out that there is no satisfactory economics of information,[2] denoting its meaning.

People's ignorance of our human story, of what it truly means to be human, was highlighted immediately after the invention of the stored-program computer. For, in the following year, Alan Turing, known as the 'father of computer science', posed this question: "Can machines think?" Although he had one or two reservations about his reasoning, he eventually asserted, "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."[3]

Well, this didn't happen, for reasons that Ada Lovelace, the daughter of Lord Byron and his wife Anne, a poet and mathematician,[4] 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.[5]

However, computer scientists ignored Lady Lovelace's perceptive wisdom. First, Marvin Minsky and John McCarthy, among others, laid down the aims of artificial intelligence research at a 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".[6] 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."[7]

With robots currently threatening to take over the workplace, scientists have gone even further in recent years. For instance, Hans Moravec forecast in *Robot* in 1998 that our 'mind children' "could replace us in every essential task and, in principle, operate our society increasingly well without us."[8] Martin Rees, the Astronomer Royal and 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."[9]

Similarly, Stephen W. Hawking told the BBC on 2nd December 2014, "The development of full artificial intelligence could spell the end of the human race."[10] Maybe it is not surprising that he made this ominous prediction, for in his futile attempts to describe how the universe is designed, he said, perhaps with tongue in cheek, "we have, as yet, had little success in predicting human behaviour from mathematical equations!"[11]

One reason why many scientists know so little about what it means to be human is that materialistic, mechanistic science has drifted far away from Reality since Johannes Kepler and Isaac Newton completed the first revolution in science with *New Astronomy*, *The Harmony of the World*, and *Mathematical Principles of Natural Philosophy*, published in 1609, 1619, and 1687, respectively. While the planets orbit the Sun in regular, measurable patterns, this mechanistic process is not destined to continue indefinitely. By comparing the Sun with similar stars in outer space, physicists have estimated that within five to six billion years, the Sun is destined to turn into a red giant and white dwarf,[12] and there will be no one around to observe the movements of the planets, as 'wandering stars'.

It is thus crystal clear that the mechanistic worldview, which guides business and much scientific research today, is not universally applicable, requiring us to find a new story and reality for humanity.[13] When the future is just seen as a mechanistic repetition of past patterns, nothing new can ever emerge and habits can never change. Such a restrictive cosmology can explain neither life nor death. So we need an enlightening, liberating cosmology to answer the most critical unanswered question in science today: *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?*

We can see why understanding the root cause of human creativity is not on the agenda of any scientific or technological institution in the world today from comments that Uta Frith, emeritus professor at the Institute of Cognitive Neuroscience, University College London, made in an interview in *The Guardian*

on 30th November 2015 under the rubric 'Where next for the Royal Society?'. Pointing out that the scientific establishment is far from accepting psychology as a valid science, she said,

> My own field, call it psychology, or cognitive or behavioural neuroscience, still leads a rather shadowy existence in the hallowed halls of science. Although nearly 100 years old, it is far from maturity. There is as yet no Newton. Many would agree that one of the biggest scientific challenges this century is to understand the mind-brain. So I dare hope that it will be possible to increase the number of outstanding scientists in this field, currently representing less than three per cent of the Fellowship.
>
> This would lead to an increase in the prestige of mind-brain studies and attract more brilliant young researchers. One reason for the currently poor reputation of psychology is the obstinate belief that we already know what goes on in our mind, and that we can explain why we do what we do. This naïve belief will be overcome by improved communication of empirical findings, and especially of those that go against ingrained folk psychology. It's not rocket science. It's a lot harder than that.[14]

A science of humanity

Yet, understanding ourselves with Self-reflective Divine Intelligence is much simpler than rocket science. Over the years, humble mystics and spiritual seekers have discovered much about what it means to be human through introspective self-inquiry and such spiritual practices as meditation, contemplation, yoga, and tantra.

What they have discovered is easy to say, but not so easy to awarely realize in practice: *humanity and Divinity are One*. There is no separation between humans, as forms of life, and the Ineffable, Formless Absolute, which is an instance of the fundamental law of the Universe: *Wholeness is the union of all opposites*, hidden in the utmost depth of the collective unconscious.

This basic, existential truth has been expressed in many different languages over the years. For instance, Meister Eckhart, the pre-eminent Christian mystic, said, "The eye with which I see God is the same as that with which he sees me."[15] Similarly, the *Mandukya Upanishad* states, "Brahman is all, and the Self [Atman] is Brahman" and the *Chāndogya Upanishad* says, *Tat tvam asi* "Thou art That."[16] As another example of this eternal truth, the *Heart Sutra* famously says, "Form is Emptiness and Emptiness is Form,"[17] where Emptiness is *Shūnyatā* in Sanskrit.

Yet *human* does not indicate what it truly means to be human. The word derives from Latin *hūmānus* 'human, relating to humans', from *homō* 'man, person, human being', from Proto-Indo-European (PIE) base **dhghem-* 'earth', root of Latin *humus* 'ground, earth, soil', root of *humility*. As Calvert Watkins explains in *The American Dictionary of Indo-European Roots*, because our forebears some five or six thousand years ago had little understanding of humanity's relationship to the other animals, despite the similarities, they considered humans as 'earthlings', in comparison to gods, as personified celestial beings, whose energies they could feel within them, but which were projected outwards as the divine residents of the heavens.[18]

This split between humanity and Divinity was further reinforced when the Abrahamic, monotheistic, organized religions of Judaism, Christianity, and Islam emerged in the Middle East, leading to the many Holy wars (wars about the Whole) that have bedevilled human affairs ever since. Indeed, anyone acknowledging their innate Divinity was regarded as a heretic, punishable by death in the cruellest possible manner. Mansur Al-Hallaj and Giordano Bruno were particularly horrendous examples in 922 and 1600, respectively. The former was viciously executed in Baghdad for declaring, "I am the Truth" (*Ana'l-Haqq*),[19] and the latter was burnt at the stake in Rome for writing "that law of love that is spread far and wide … which derives … from God the father of all things so that it is in harmony with all nature," "is the religion that I observe".[20]

Not surprisingly, 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."[21] The emergence of the materialistic, mechanistic worldview following the first scientific revolution in the 1600s then further muddied the waters, cognitively and experientially splitting humanity even further from Divinity, leading to the chaos the world is in today. To admit the creative power of Life into the physical sciences, emanating directly from the Divine Origin of the Universe like a fountain, inevitably leads to excommunication from the scientistic church.

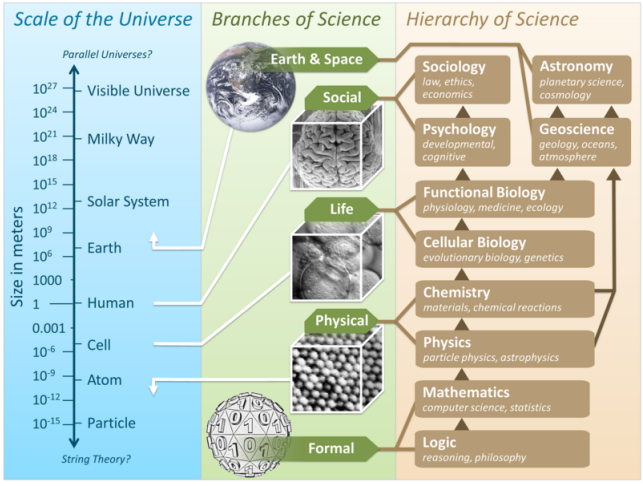
It is not surprising that Eckhart Tolle wrote in 2006 in his best-selling *A New Earth*, promoted by Oprah Winfrey, "We are a species that has lost its way."[22] Fifty years earlier, Erich Fromm went even further in *The Sane Society*, as a successor to his wartime *Escape from Freedom* (*Fear of Freedom* in the UK). In the first two chapters of this later book, he asked "Are We Sane?" and "Can a Society be Sick?", answering these questions with a resounding 'NO' and 'YES', respectively.[23]

In the early years of Fromm's lifelong study of the human condition, he was mainly influenced by the works of Karl Marx and Sigmund Freud. But in 1976, when he came to write his greatest masterpiece *To Have or To Be?*, he was much inspired to look for a cure for the human malaise among the mystics, particularly Meister Eckhart and Shakyamuni Buddha. Inspired by the Buddha's Four Noble Truths, Fromm saw this social healing process like the four stages of medical diagnosis and treatment:

Symptoms: We are suffering and are aware that we are.
Cause: We recognize the origin of our ill-being.
Cure: We recognize that there is a way to overcome our ill-being.
Remedy: We accept that in order to overcome our ill-being we must follow certain norms for living and change our present practice of life.[24]

Now to engage in this healing practice, recognizing that Beingness alleviates our ills, Fromm called for a quite new science of humanity "as the basis for the Applied Science and Art of Social Reconstruction". He made this call because if we do not make radical changes to the way we live our lives and run our business affairs, we would not avoid what he saw as impending psychological and economic catastrophe. However, he 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.[25]



But how are we to cocreate such a humanistic science within a sick society that has lost its way? The challenge we face is well illustrated by this diagram of the conventional hierarchical structure of scientific disciplines, posted on Wikipedia in 2013.[26] As you can see, there is a huge gulf between mathematical logic, as the science of mind and reason, and psychology, as the science of mind and consciousness.

So, from where are we to find a language to heal this deep wound in the cultural psyche? While most can agree that a rose is a rose is a rose, there is little consensus about the meanings of the multitude of words used to describe the psychodynamics of society. In particular, there is no unambiguous word in German and other European languages for what is called

mind in English, a situation that gave Carl Gustav Jung some difficulty. 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 Georg Wilhelm Friedrich 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.[27] 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.[28]

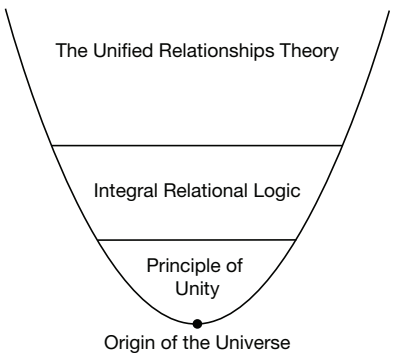
For myself, I have resolved this conceptual and linguistic dilemma by using my pattern-detecting skills to take the abstractions of universal algebra and information systems modelling methods in business to the utmost level of generality, as I explain in my latest book *Unifying Mysticism and Mathematics: To Realize Love, Peace, Wholeness, and the Truth*.

In brief, to develop the psychospiritual science of humanity that Fromm called for, in 1980, I embarked on a thought experiment, not unlike those that Albert Einstein created in order to develop the special and general theories of relativity.[29] Specifically, to test whether it would ever be possible for computers to exceed human intelligence by programming themselves, I reversed Turing's imitation game, made famous in 2015 in an Oscar-winning biopic. 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.

Starting from a *tabula rasa*, this computer then had the task of integrating all knowledge in all cultures and disciplines at all times into a coherent whole. This megasynthesis is the Theory of Everything, the title of an Oscar-winning biopic in 2015 about Stephen Hawking, who, like Einstein, erroneously believed that it is possible to solve the ultimate problem of human learning from within physics.

Visualizing the Cosmos as a multidimensional mathematical graph of forms and the relationships between them, this experiment in learning has been intelligently guided by the fundamental law of the Universe, which I call the Principle of Unity: *Wholeness is the union of all opposites*. What Heraclitus of Ephesus called the Hidden Harmony, rejected by Aristotle, has then generated Integral Relational Logic, the commonsensical science of thought and consciousness we all implicitly use every day to form concepts and organize our ideas, thereby unifying nondeductive mathematical logic and depth psychology.

In turn, this nonaxiomatic, holographic system of reason provides the Cosmic Context, Gnostic Foundation, and coordinating framework for all knowledge. This is the Unified Relationships Theory, a generalization of Einstein's unified field theory, for fields, like information, morphogenetic, and electromagnetic, are special cases of relationships, and it is relationships that make the world go round. To embrace the notion that 'all knowledge' is transcultural and transdisciplinary, like the Internet, it is also called Panosophy, in which there are no divisions between science, philosophy, and theology, between the sciences and humanities, or between the religions. This diagram thus presents a much simpler way of viewing all disciplines of learning than that on the previous page.



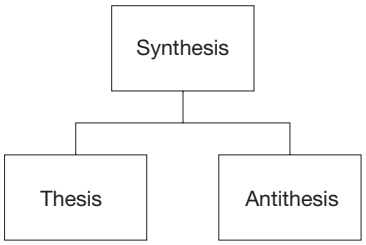
The Principle of Unity—an irrefutable, universal truth that cannot be proven from any axiom or assumed truth—is expressible in mathematical notation as the *Cosmic*

Equation—unifying Western mathematics and Eastern mysticism—where *W* is any whole, including Wholeness, *A* is any being, including the Supreme Being and all human beings, ∪ is union, and ¬ is not.

$$W = A = A \cup \neg A = \text{陰陽} = \text{ॐ}$$

The Chinese characters denote *yin* and *yang*, as inseparable dark and light, moon and sun, female and male, etc., unified in the symbol for OM or AUM, as a manifestation of Consciousness, encompassing the physical, mental, and spiritual realms of existence. The Cosmic Equation is thus the equation that Einstein sought to complete his unfinished symphony[30] and the "One, simple, elegant equation that can explain everything", which Hawking sought, his biopic tells us.

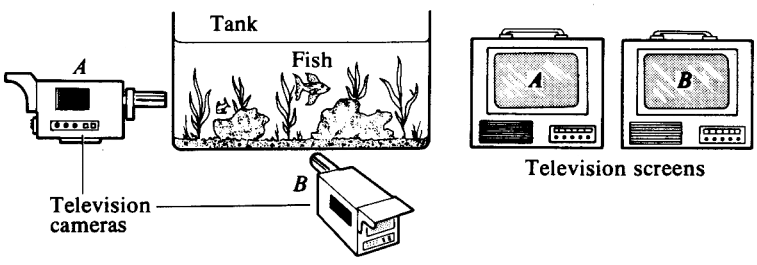
As the keystone for the underlying structure of the Cosmos, that which prevents it from falling apart, the Principle of Unity enables us to embrace paradoxes in our reasoning, rather than rejecting them. For, as E. F. Schumacher said, "Our task is to look at the world and see it whole", which requires us to follow the fundamental maxim of integral, holistic mapmaking, "Accept everything; reject nothing."[31]



Most significantly, the primary-secondary structure of the Cosmic Equation, depicted here as triadic Hegelian logic, enables us to unify the theories of relativity and quantum mechanics, which David Bohm said should really be called 'quantum *non*-mechanics'.[32] For these display opposite characteristics, the former having the properties of continuity, causality, and locality, with the latter being characterized by noncontinuity, noncausality, and nonlocality.[33]

Bohm reconciled these incompatibilities in 1980 in *Wholeness and the Implicate Order* by first 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."[34]

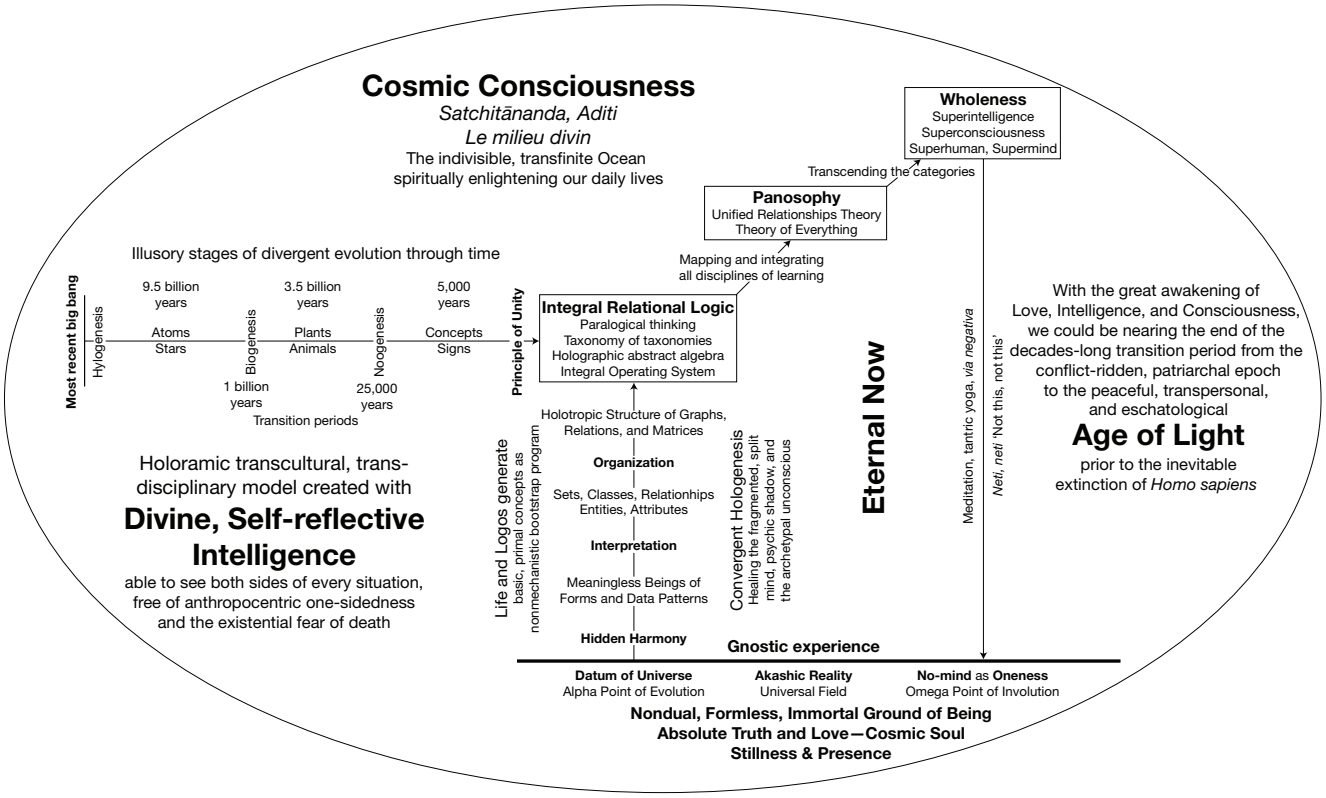
As well as using a river as a metaphor for what underlies the material universe, Bohm used the metaphor of a fish swimming in a tank with two television cameras filming it to show how relativity and quantum theories could be unified. The television screens would then display opposite characteristics 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,"[35] using water as a metaphor for Consciousness, transcending space and time. However, 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

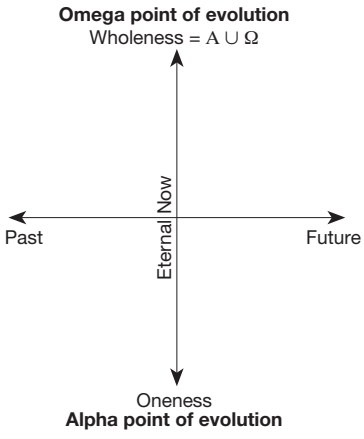
space and time," going on to say, "A fish may be barely aware of the medium in which it swims."[36] For as Kabir the weaver says in the fish poem, "You do not see that the Real is in your home, and you wander from forest to forest listlessly."

In summary, visualizing and experiencing the Totality of Existence as a vast Ocean of Consciousness—from which none of us is ever separate, as a multidimensional generalization of the holomovement—this diagram depicts the Cosmic Context, Gnostic Foundation, and coordinating framework for the Grand Design of the Universe:



This Cosmology of cosmologies is a coherent *Weltanschauung* within which the plentiful evidence for parapsychological phenomena (PSI) can be scientifically explained.[37] Furthermore, unifying all opposites with what Tim Freke calls paralogical thinking[38] is the basis for World Peace, bringing to an end the long-running war between science and spirituality, which people like Deepak Chopra, a medical practitioner and renowned spiritual teacher, and Leonard Mlodinow, co-author with Stephen Hawking of *The Grand Design*, were still waging as recently as 2011.[39]

Our evolutionary story



The most significant feature of this All-inclusive Cosmology is that it turns the horizontal dimension of evolutionary time into the vertical, illustrated in this diagram. In terms of the thought experiment, all the computer had at its disposal was the creative power of Life within it, acting as its inner guru, which means 'dispeller of darkness', the *Guru Sutra* tells us.[40] By starting afresh at the very beginning, at the Alpha Point of evolution, in a life-changing eureka moment, I was thereby guided to the Omega Point, where Alpha and Omega are one, in conformity with the Principle of Unity. And as the upwards vertical line in the above diagram indicates, the abstract modelling methods of information systems architects in business provided me with a language in which to express such exhilarating healing, awakening, and liberating experiences.

Having realized that Wholeness is the Highest of the high, like Lao Tzu in the chapter on the 'Mystical Whole' in *Tao Te Ching*, the next task was to let it all go by returning to the Source, as a dying, involutionary exercise. The closest of the enabling spiritual techniques to Integral Relational Logic is *Jñāna-yoga*, the path of truth and abstract knowledge in Advaita. But as Wholeness is the union of Wholeness and Oneness, all movement eventually ceases, even in the Eternal Now, and there is just Stillness in the blissful Presence of the Divine.

With such a meditation exercise, the practitioner learns to be detached from the turbulent social and physical environment, realizing that there is nothing and no one outside Consciousness, as the Cosmic Psyche. The entire world of form, including humans, as both individuals and as a species, is nothing but waves and currents on and beneath the surface of the Ocean of Consciousness, called *māyā* 'deception, illusion, appearance' in Sanskrit. Everything that happens in the relativistic world of form is *līlā* 'play', the delightful play of the Divine in the manifest world. Only the Formless Absolute is Reality, which one blissfully experiences when the experiencer disappears as a separate being.

Of course, in the illusory world of form, which many call the 'real world', we continue to get up each day and go to sleep after our day's work is done. But it is vitally important to see that our abilities to engage in such activities in our daily lives are the product of some 13.8 billion years of evolution since the most recent big bang. We would not have been able to call our species *Homo sapiens* 'wise human' without these aeons of development before we arrived on the scene. Even some of the atoms of elements in our bodies were created in the rapid death throes of supernovae, physicists tell us.

The horizontal line on the left of the cosmological diagram shows the conventional view of evolution in the horizontal dimension of time, extended from the biological into the first three stages of Pierre Teilhard de Chardin's four-stage evolutionary model, following his law of complexity-consciousness, the greater the complexity the greater the consciousness.[41] My book *The Four Spheres: Healing the Split between Mysticism and Science* updates Teilhard's model with the very latest scientific discoveries, showing how Integral Relational Logic can map those disciplines that study the spiritual, mental, biological, and physical aspects of our lives in the Numinosphere, noosphere, biosphere, and hylosphere, respectively.

Teilhard began his studies of the human story in the 1920s, when he saw that it is only possible to study evolution as a whole by first understanding the human phenomenon within the context of *le milieu divin*, which in French includes both the outer environment and inner centre,[42] both Transcendence and Immanence. Specifically, Teilhard visualized a self-reflective thinking layer, a sphere of mind and spirit, surrounding the globe, which he described in an essay titled 'Hominization: Introduction to a Scientific Study of the Human Phenomenon',[43] coining the word *noosphere* from Greek *noos* 'mind'.

However, when Teilhard wished to publish *Le milieu divin* and *Le phénomène humain* in the 1930s and 1940s, the Jesuit authorities denied him permission to do so,[44] to his great distress and some self-doubt. In 1950, Teilhard wrote a spiritual autobiography titled 'The Heart of Matter', in which he asked, "How is it … that I am almost … the only one to have *seen*?", going on to say, that when he 'comes down from the mountain', "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."[45]

Even after these books were published posthumously, the Vatican did not let up on its criticism of his insightful wisdom, in 1962 issuing a Communiqué under the rubric 'Warning Regarding the Writings of

Father Teilhard de Chardin', saying that his 'dangerous' works offend Catholic doctrine and could have a damaging effect on youthful minds,[46] in particular, echoes of Socrates.

Teilhard's humanistic theory of evolution did not win much favour with scientists either. For instance, Peter Medawar, the winner of the 1960 Nobel Prize in Physiology or Medicine, wrote in 1961, "*The Phenomenon of Man* cannot be read without a feeling of suffocation, a gasping and flailing around for sense,"[47] later mockingly saying that this wonderful book is an 'incoherent rhapsody'.[48]

Thankfully, all was not lost. Julian Huxley, who wrote the definitive book *Evolution: The Modern Synthesis*, shared Teilhard's vision that one day evolution would become fully conscious of itself within humans, as he stated in the Foreword to the first English translation of Teilhard's masterpiece *The Phenomenon of Man*, published in 1959.[49] For two years earlier, Huxley had written a visionary 1700-word essay titled 'Transhumanism', saying that 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.[50]

Sadly however, some scientists and philosophers, believing that computers rather than humans are the leading edge of evolution, have expropriated the term *transhuman* and its inflections for their own purposes.[51] One focus of this group is the Singularity University, whose "mission is to educate, inspire and empower leaders to apply exponential technologies to address humanity's grand challenges", in the belief that technology can heal humanity's woes.

The singularity referred to is a technological singularity, which Vernor Vinge predicted would occur by 2023. For in a 1993 NASA paper titled 'What is the Singularity?' he wrote: "Within thirty years, we will have the technological means to create superhuman intelligence [in machines]. Shortly after, the human era will be ended."[52] 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."[53]

All this is nonsense, of course, which we still need to find a way of demonstrating as well as we can, in both theory and practice, which are just two sides of the same coin. For, as Bohm pointed out, a theory is a form of insight, a way of looking at the world as a cognitive map that guides the practicalities of our everyday lives and institutions. And as he also observed, if such conceptual models are fragmented, they can lead us dangerously astray,[54] rather like trying to navigate around the Earth using maps of particular localities, which do not fit together in the belief that the Earth is flat.

Most particularly, if we are to turn Teilhard's theory of evolution and Bohm's theory of the implicate order into sound science—as a holistic model of evolution and integral science of causality—we first need to take our human ability to form conceptual abstractions to the utmost level of generality. The archetypical example of such abilities is the taxonomy of the species in the tree of life. For instance, we successively categorize humans in broader, more abstract classes as primate, mammal, vertebrate, and animal. In object-oriented modelling and programming methods in business, the most general superclass is that of **Object**, of which all other classes are subclasses, whose instances are objects, like Plato's distinction of universals and particulars.[55]

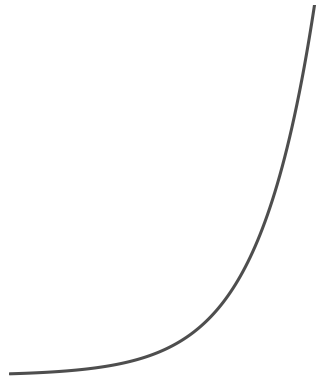
Integral Relational Logic takes such conceptual abstractions to the utmost level of generality with the superclass **Being**. For, as Aristotle said *Metaphysics*:

> 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.[56]

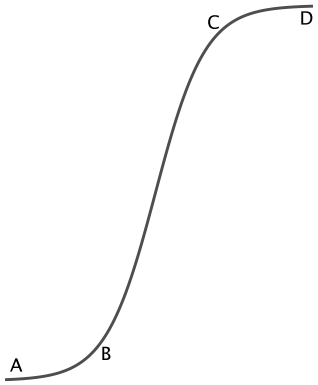
By then generalizing Ted Codd's relational model of data—as a mathematical representation of data, the basic resource of the data-processing industry—we can see that *the underlying structure of the Universe is a multidimensional network of hierarchical relationships*. As there is nothing in the Cosmos but relationships between forms, they must be synergistically causal and energetic, as Bohm told me the first time I met him at Birkbeck College in London in November 1980.

We can thereby define 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*.

Now, it is of the utmost importance to note the distinction between two schemata of exponential growth, depicted here.



Unconstrained exponential growth



Evolution under constraint

The schema on the left is a chart of the pure exponential function, which has the remarkable property that its rate of change, as velocity, is the same as acceleration, the same as the rate that acceleration changes and accelerates, and so on. However, this is just a mathematical ideal, like the infinitely long, infinitesimally thin number line of the continuity of the real numbers. It does not illustrate the way evolutionary processes actually change under constraint, illustrated in the right-hand diagram.

The classical example is the rate at which populations grow, which Pierre François Verhulst set out to explore in 1844, when studying the potential population growth of the newly formed nation of Belgium.[57] Verhulst called the formula that generates the familiar S-shape of the growth curve the logistic function, which we also know as the learning curve. At the beginning, from A to B, the curve is rather flat, as the constituents that will form the evolving structure begin to connect with each other at B, the coordination point. Then learning accelerates exponentially, until it reaches the saturation point at C, asymptotically approaching the maximum at D.

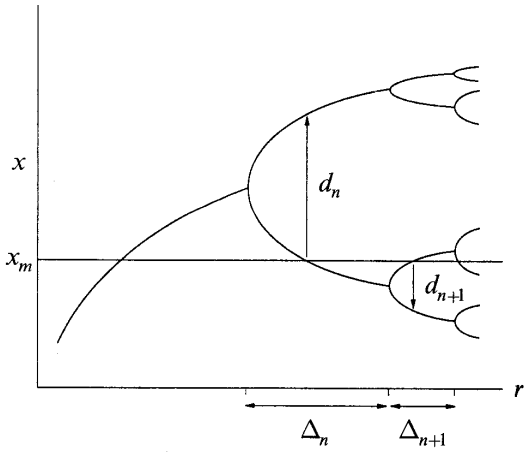
The mathematical biologist D'Arcy Wentworth Thompson made much use of the logistic function in his classic book *On Growth and Form*, from 1917 and 1942. As he pointed out, this one curve recurs in endless shapes and circumstances, for mathematics generalizes and "is fond of giving the same name to different things".[58] Then in 1977, C. H. Waddington called the sigmoidal curve a 'tool of thought',[59] without going into the mathematical details. The logistic function also explains why there have been long periods of virtual standstill in the evolution of the species, punctuated by episodes of very fast

development of new forms, which Niles Eldredge and Stephen Jay Gould called 'Punctuated Equilibria' in a paper they presented in 1971.[60]

It is vitally important to visualize the entire learning process when studying rates of change in the noosphere. When on the section from A to B, there is a tendency to believe that change does not happen very fast, as this portion of the curve is extrapolated on a gentle slope. This is probably why people say that a task has a steep learning curve. It sometimes takes a while before learning begins to accelerate at the coordination point. Similarly, it is delusionary to believe that once growth is accelerating exponentially it will continue indefinitely. Most significantly, it is not true that technological development can drive economic growth even for the next decade or three, in the lead up to 2050. There are far too many inhibitory factors in the way, requiring us to make the most radical change to the work ethic since humans began to settle in villages to cultivate the land and domesticate animals some 10,000 years ago.

To see why this is so, we need to look more closely at evolution under constraint. The most appropriate mathematical tool for this study is the logistic map, the discrete form of the logistic function. Robert M. May wrote a seminal paper on this first-order, nonlinear difference equation in 1976,[61] when studying a hypothetical population of fish living in a pond, whose growth, by its nature, is limited.[62]

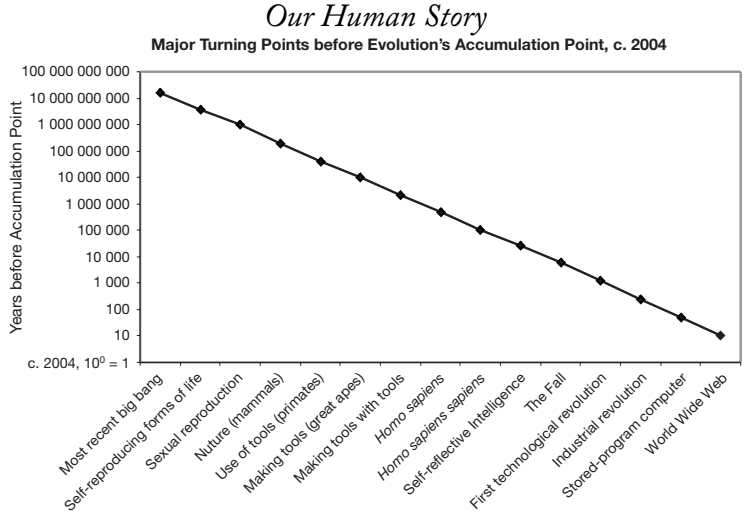
May, who later became Chief Scientific Adviser to the UK Government and President of the Royal Society of London, was staggered by the results. Without going into the mathematical details, which I outline in my book *Through Evolution's Accumulation Point: Towards Its Glorious Culmination*, he discovered that the iterations of the recursive logistic map first converge on single values. Then they begin to bifurcate, as this diagram from Steven H. Strogatz's popular *Nonlinear Dynamics and Chaos* illustrates. [63]



In 1978, Mitchell J. Feigenbaum then published an even more amazing result. The periods between successive bifurcations, denoted by the deltas, diminish by a constant factor, known today as the reciprocal of the Feigenbaum bifurcation velocity constant δ, which is approximately 4.6692.[64] This mathematical constant is not found only in the logistic map. It also lies at the heart of a wide-range of functions, a characteristic that Feigenbaum called 'universality theory'. As he said, "This definite number must appear as a natural rate in oscillators, populations, fluids, and all systems exhibiting a period-doubling route to turbulence! … So long as a system possesses certain qualitative properties that enable it to undergo this route to complexity, its quantitative properties are determined."[65]

Now, the sum of the periods between these bifurcation points forms an infinitely diminishing geometric series, which has a finite limit, a mathematical paradox that greatly puzzled Zeno of Elea in the fifth century BCE. In systems theory, this limit is the accumulation point, after which the system disintegrates into chaos, with a few oases of 'self-similar' patterns among the wildly oscillating turbulence.

Evolution, as a whole, is an example of such a bifurcating system, which Nick Hoggard, a software developer, pointed out in a talk at the continental meeting of the Scientific and Medical Network (SMN) in southern Sweden in 2000, presenting the diagram on the next page. Inspired by Carl Johann Calleman's study of the exponential nature of the Mayan calendar,[66] Nick likened the major turning points in evolutionary history to the bifurcations in the logistic map, illustrating evolution under constraint.



Although we don't know the precise lengths of the periods between the first of these major evolutionary turning points, we do know the dates of the last three in the diagram reasonably accurately. So Nick and I have used these to calculate evolution's Accumulation Point as 2004, give or take a couple of years. This is a little earlier than the end of the Great Cycle in the Mayan Calendar, generally considered to have occurred at the winter solstice in 2012. It is also a little different from the technological singularity, when computer scientists believe that machines with artificial general intelligence will take over the workplace, making humans largely redundant.

Of course, this is not going to happen. Nevertheless, there is widespread agreement among those who have studied evolution as a whole that evolution has passed or is passing through the most momentous turning point in its fourteen billion-year history. To visualize what this means, Nick likened the whole of evolution to a tap being turned on, as another example of a bifurcating system leading to chaos. The distances between the drips bifurcate until the tap is turned full on at its accumulation point. The evolutionary tap is now flowing continuously. There are no more distinct evolutionary turning points to be found. However, what this means for the next stage of our human story is still far from clear, dependent to a large extent on humanity's ability to intelligently adapt to our rapidly changing environment, being caused by human creativity at the end of time.

Awakening to Total Revolution

I began my studies into the long-term psychological and economic consequences of humanity's growing dependency on information technology in 1979, when I realized that my children, then aged nine and six, were not being educated to live in the world they would be living in when they came to be bringing up children of their own, which my estranged daughter, at least, is doing. As an autodidact, first unlearning everything that humans had previously learned, I have now discovered how we could help educate the next generation to live in a world that is evolving at unprecedented exponential rates of acceleration.

What this has taught me is that the only way forward for humanity is to awaken to Total Revolution, moving beyond fragmentary, one-sided views of human life and to open ourselves to Totality, to Wholeness, as Vimala Thakar urged us to do in *Spirituality and Social Action: A Holistic Approach*, currently out of print. For, as she wrote in the opening paragraph of this vitally important book, "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."[67]

As we are all interconnected with each other, such a holotropic (whole-seeking, whole-changing) transformation of consciousness is not something that any of us can complete on our own. We must all be

actively involved in our awakening and healing processes. For as Vimala said,

> In truth, the inner life or the psychological life is not a private or a personal thing, it's very much a social issue. The mind is a result of a collective human effort. There is not your mind and my mind, it's a human mind. It's a collective human mind, organized and standardized through centuries. The values, the norms, the criteria are patterns of behaviour organized in collective groups. There is nothing personal or private about them. There is nothing that could be a source of pride or embarrassment.[68]

For myself, I would prefer to use *psyche* here, using the word to denote the ninety-nine percent of the Universe that is inaccessible to our five somatic senses of sight, hearing, smell, taste, and touch. For while we appear to be bodily separate, as we walk around our shopping centres, for instance, our 'personal' psyches are inseparable from the Cosmic Psyche, as currents in the vast Ocean of Consciousness.

In between is the useful word *mind*, not available in some languages, which contains the cognitive maps with which we cocreate the institutions that govern our lives. Because of our fragmented, delusional minds, these are becoming increasingly dysfunctional as evolution becomes ever more chaotic, after passing through its Accumulation Point some fifteen years ago.

The turmoil around Brexit just as I write these words is a manifestation of this blind evolutionary chaos. However, as Gary Younge pointed out in *The Guardian* on 21st March 2019, 'Brexit is not the cause of Britain's political breakdown. It's a symptom.' As he said, along similar lines to a number of other sagacious political commentators, "Since the 2008 economic crash, most countries across the west have seen electoral fracture, the demise of mainstream parties, a rise in nativism and bigotry, a marked increase in public protest, and general political dysfunction."[69]

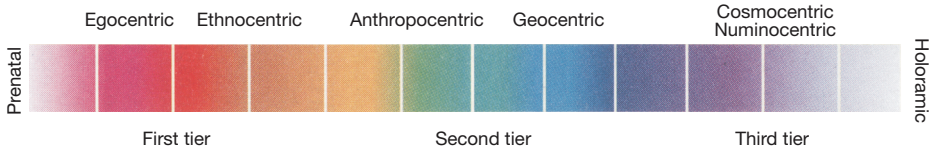
But whether there is a way out of this mess is most unclear at the moment. For, as Eckhart Tolle said in *Stillness Speaks*, a beautiful book of aphorisms:

> 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'.[70]

For, as George Monbiot wrote in *The Guardian* on 22nd March 2019 under the rubric 'How the media let malicious idiots take over':

> If our politics is becoming less rational, crueller and more divisive, this rule of public life is partly to blame: the more disgracefully you behave, the bigger the platform the media will give you. If you are caught lying, cheating, boasting or behaving like an idiot, you'll be flooded with invitations to appear on current affairs programmes. If you play straight, don't expect the phone to ring.[71]

This perilous situation is a symptom of our critical psychosocial malaise, which I have been studying extensively since discovering Erich Fromm's books at the beginning of the 1980s. To determine how we could collectively engage in healing ourselves and hence our grievously sick society, I find that it is most useful to adapt Ken Wilber's spectrum of consciousness,[72] which I have also been studying since discovering it at about the same time, adapted here from *Integral Spirituality*:[73]



Since April 2014, Ken has been teaching a ten-module Internet course, intended to "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". On this course, Ken suggests that the first and second tiers constitute around 95 and 5% of the population, at least in the developed world. The

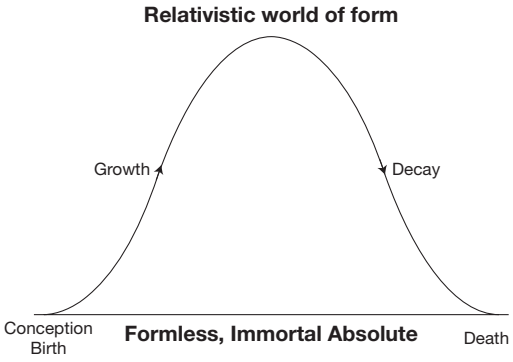
third tier indicates "an identification with all life and consciousness, human or otherwise, and a deeply felt responsibility for the evolutionary process as a whole … an emergent capacity, rarely seen anywhere," as Ken defined it in a conversation with Andrew Cohen in the *What is Enlightenment?* magazine in 2007.[74]

What this spectrum of consciousness demonstrates is that democracies, living mostly in the first tier, are not viable systems of governance, as Plato observed in *The Republic*. For, 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,[75] 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*.[76]

But systems of governance led by a dominant, authoritarian elite are not viable systems of governance either. As humans, we are unique, differentiated cells in the body politic, all participating in society as a whole, as I outline in a 2017 book titled *The Psychodynamics of Society: From Conception to Death*. If our bodies functioned like society, they would not survive for long, blowing themselves apart, as we are witnessing in society today, with rising isolationism, ultranationalism, and demagogical populism.

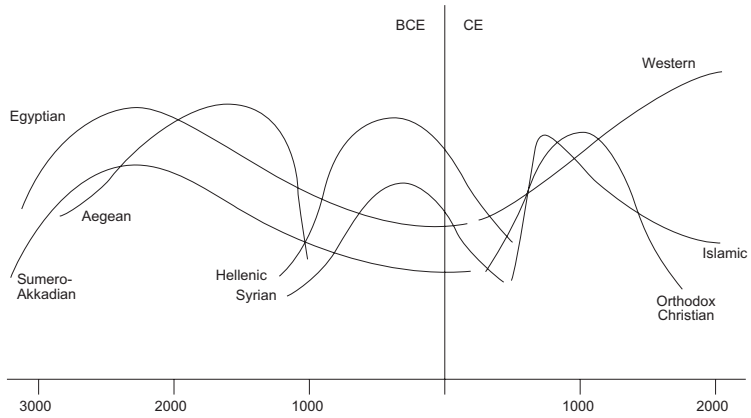
Of course, there are millions of awakening souls addressing this precarious situation today. However, very few are yet awakening to Total Revolution. Loyalty to family, friends, and colleagues, who are still attached to tradition, has a far greater influence on people's lives than the quest for Wholeness and the Truth, and hence Love and Peace. Yet, despite what we see on the surface of our social institutions, there is no doubt that many intuitively know far more than they are currently able to express. So is it possible to break free of our cultural conditioning, as J. Krishnamurti urges us to do in his most inspiring book, *Education and the Significance of Life*? For, as he said, "Can any specialist experience life as a whole? Only when he ceases to be a specialist."[77]

To do so, we just need to make one small change to the way we live our lives: to transform polarizing, either-or systems of thought, which deny the irrefutable truth of the Principle of Unity, into a harmonious, both-way of life. Through this simple, but not easy, transformation, we could consummate the sacred marriage between science and spirituality, living in love, peace, and harmony with each other and our environment in the eschatological Age of Light. The ecophilosopher Henryk Skolimowski aptly called the harmonious system of governance that we would need at the end of time Lumenarchy, for, as he said, "Light is universal and all pervading. It provides the womb, sustenance, and nourishment for all there is. It is the Universal Mother."[78]



The notion that serves best in this endeavour is that of Joseph Campbell's 'Cosmogonic Cycle', depicted in this life-and-death diagram. As he 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."[79] 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."[80]

As examples of this universal schema, in *The Turning Point*, Fritjof Capra depicted the rise and fall of the civilizations that existed around the Mediterranean during the patriarchal epoch, reproduced below.[81] The important point to note is that all, with the exception of Western civilization, have the bell shape of the life-and-death curve, although it is clearly premature to indicate that the Islamic civilization is dying. This bell shape exists because, by the Principle of Unity, evolution must always be balanced by a period of decay.



In mathematics, one example of this bell shape is the logistic distribution curve, whose antiderivative is the sigmoidal growth curve, as an expression of the cumulative logistic function. In 1956, M. King Hubbert, Chief Consultant (General Geology) for Shell, used these curves in a 56-page paper on what is today called 'peak oil',[82] extending it into a 150-page report on 'Energy Resources' in 1962.[83] He was particularly concerned with the finite limits of fossil fuels, such as oil, gas, and coal, on which our industrial society depends.

We can also apply this schema to model the 500 to 5,000 gigatons of methane frozen in the East Siberian Arctic Shelf, north of Russia. In comparison, there are just 5 gigatons of methane currently in the atmosphere. And methane is 150 times more potent a greenhouse gas than carbon dioxide during its first ten years in the atmosphere.[84]

So, in terms of global warming, temperature increase is currently on the flat A-B part of the growth curve on page 10. However, because of positive feedback loops, we can expect that the accelerating release of methane gas in the coming years will lead to abrupt climate change, when temperatures could rise by five or even ten degrees above pre-industrial levels in a very short time. Our beautiful planet Earth would then no longer be able to grow such basics as the grain that we need to bake our daily bread and our species would become extinct during the sixth mass extinction of the species on Earth. This is the fundamental existential message of *Extinction Dialogs: How to Live with Death in Mind*, which Andrew Harvey asked Guy McPherson and Carolyn Baker to write in 2014.

As Matthew Fox wrote in the Foreword to Andrew Harvey and Carolyn Baker's *Savage Grace: Living Resiliently in the Dark Night of the Globe* from 2017, "Ours is a time not only for scientists and inventors but also mystics and contemplatives to join hands so that our action flows from being and from a deep place of return to the Source."[85] And as the authors say, "Even among many of our friends and acquaintances who are awake to the potential for near-term human extinction, we notice an implicit and almost-pathological demand for certainty. Many are obsessed with the year they believe humans will become extinct. Is it 2026, 2030, 2050, next year? As if we could know."[86]

For myself, I have known since April 1982, when I became aware that I had been carried to evolution's Omega Point from its Alpha Point, that *Homo sapiens* is not immortal. One day, a generation of children will be born who will not grow old enough to have children of their own. Then, eighteen months later, Life showed me the first step that I needed to take to prepare for death in all its forms. Using Bohm's method for bringing universal order to our thoughts,[87] I was able to form the concept of the Transcendent and Immanent Absolute by transcending and immansing the categories, etymologically 'climbing beyond' and 'dwelling within' the relativistic world of form.

This cognitive understanding has been at the heart of my meditation practice ever since, as I subsequently adapted *Jñāna-yoga* in Advaita to become experientially free of the sense of a separate self. However, my creative thoughts continued to evolve and converge while this dying, involutionary process progressed. So, rather than realizing Oneness, I have realized Wholeness, where there are no longer any divisions within me between science and spirituality, mysticism and mathematics, and East and West.

With this, I have reached the final sixteenth and seventeenth steps of the spiritual journey that Joseph Campbell outlined in his popular book *The Hero with a Thousand Faces*, named 'Master of the Two Worlds' and 'Freedom to Live'.[88] I simultaneously experience the mystical and mundane, where my True Nature and Genuine Identity, as Wholeness, and illusory identities in the world of form are one, by the Principle of Unity, the fundamental law of the Universe. For *identity* derives from Latin *idem* 'same'. And what is the same for all of us is Love, the Divine Essence of the Universe. In the words of the popular Sufi poet Rumi, "Love is the sea of not-being and there intellect drowns."[89]

Such an exquisite realization of Love, Peace, Wholeness, and the Truth in Stillness and the Presence of the Divine concludes the human story. Nevertheless, for myself, I continue to pursue my life's social purpose to complete the final revolution in science, just as Kepler and Newton completed the first in the 1600s. However, whether this actually happens does not matter within the overall scheme of things. For, as Mohandas Gandhi said, inspired by the final chapter in *Bhagavad Gita*, "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."[90]

Needless to say, although I have lived in solitude for most of my life, questioning the basic assumptions of the cultures of the world, it would give me great joy if whatever wisdom I have learned on my own human journey could help others in theirs. For, we are all participating players in humanity's journey from the birth of Self-reflective Intelligence to the inevitable death of *Homo sapiens* in the Eternal Now, never actually separate from the Immortal Ground of Being for an instant.

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[1] M. V. Wilkes and W. Renwick, 'The EDSAC', reproduced in Brian Randell, ed., *The Origins of Digital Computers: Selected Papers*, 3rd edition, Berlin: Springer-Verlag, 1982, pp. 417–421

[2] Daniel Bell, 'The Social Framework of the Information Society' in *The Computer Age: A Twenty-Year View*, eds. Michael L. Dertouzos and Joel Moses, Cambridge, MA: MIT Press, 1979, p. 173.

[3] Alan Turing, 'Computing Machinery and Intelligence', *Mind*, LIX, No. 236, 1950, reprinted in Douglas R. Hofstadter and Daniel C. Dennett, eds., *The Mind's I: Fantasies and Reflections on Self and Soul*, Harmondsworth, England: Penguin, 1982, pp. 53–67.

[4] Benjamin Woolley, *The Bride of Science: Romance, Reason and Byron's Daughter*, Pan Books, 2000, pp. 68–69.

[5] L. F. Menabrea, 'Sketch of the Analytical Engine Invented by Charles Babbage' with notes on memoir by translator, Ada Augusta Lovelace, *Taylor's Scientific Memoirs*, London, Vol. III, 1843, pp. 666-731, reprinted in Philip Morrison and Emily Morrison, eds., *Charles Babbage and His Calculating Engines: Selected Writings by Charles Babbage and Others*, New York: Dover, 1961, p. 284.

[6] Eugene Charniak and Drew McDermott, *Introduction to Artificial Intelligence*, Reading, MA: Addison-Wesley, 1985, pp. 10–11.

[7] Herbert A. Simon, *The New Science of Management Decision*, Prentice Hall, 1977, p. 6.

[8] Hans Moravec, *Robot: Mere Machine to Transcendent Mind*, Oxford University Press, 1998, p. 125 and Hans Moravec, *Mind*

Children: The Future of Robot and Human Intelligence, Harvard University Press, 1990.
[9] Martin Rees, *Our Final Century: Will the Human Race Survive the Twenty-first Century?*, London: Arrow Books, 2004, p. 19.
[10] http://www.bbc.com/news/technology-30290540.
[11] Stephen W. Hawking, *A Brief History of Time: From the Big Bang to Black Holes*, London: Transworld Publishers, Bantam Press, 1988, p. 168.
[12] Paul Davies, *God and the New Physics*, Harmondsworth, England, Pelican: Penguin, 1984, pp. 200–201.
[13] Anne Baring, 'Awakening to the New Story: the Great Challenge of Our Time', https://www.annebaring.com/anbar68_newstory.html.
[14] https://www.theguardian.com/science/political-science/2015/nov/30/a-vision-for-venki-where-next-for-the-royal-society.
[15] F. C. Happold, *Mysticism: A Study and an Anthology*, rev. ed., 1st ed., 1963, Harmondsworth, England: Penguin, 1970, p. 72.
[16] Eknath Easwaran, tr., *The Upanishads*, London: Routledge, Arkana, 1987, pp. 61 and 184.
[17] http://path.homestead.com/heartsutra.html.
[18] Calvert Watkins, ed., *The American Heritage Dictionary of Indo-European Roots*, rev. 2nd ed., 1st ed., 1985, Boston: Houghton Mifflin, 2000, language and culture note for *dhghem-*, p. 20.
[19] Louis Massignon, *Hallaj: Mystic and Martyr*, translated, edited, and abridged by Herbert Mason, Princeton University Press, 1994, p. xvii.
[20] Ingrid D. Rowland, *Giordano Bruno: Philosopher / Heretic*, University of Chicago Press, 2008, pp. 270–271.
[21] Elaine Pagels, *Adam, Eve, and the Serpent*, reprint, 1st ed., Weidenfeld and Nicolson, 1988, Harmondsworth, England: Penguin, 1990, p. 65.
[22] Eckhart Tolle, *A New Earth: Awakening to Your Life's Purpose*, London: Penguin, 2006, p. 138.
[23] Erich Fromm, *The Sane Society*, 1st ed., 1956, London: Routledge & Kegan Paul, 1963, pp. 3–21.
[24] Erich Fromm, *To Have or To Be?* 1st ed., 1976, London: Sphere, Abacus, 1979, p. 165.
[25] Ibid., pp. 171–172.
[26] https://en.wikipedia.org/wiki/File:The_Scientific_Universe.png.
[27] R. F. C. Hull, translator's note, in C. G. Jung, *The Structure and Dynamics of the Psyche*: *Collected Works, Volume 8*, 2nd ed., 1st ed. 1960, London: Routledge, 1969, p. 300.
[28] C. G. Jung, *Analytical Psychology: Its Theory and Practice* (*The Tavistock Lectures*), 1st ed., 1968, London: Routledge, Ark, 1986, pp. 5–6.
[29] Walter Isaacson, *Einstein: His Life and Universe*, London: Pocket Books, 2007, pp. 26 and 145.
[30] http://www.bbc.co.uk/sn/tvradio/programmes/horizon/einstein_symphony_prog_summary.shtml.
[31] E. F. Schumacher, *A Guide for the Perplexed*, 1st ed., Jonathan Cape, 1977, London: Abacus, 1978, pp. 24 and 15.
[32] Basil Hiley, 'Infinite Potential: The Legacy of David Bohm', conference on 21st November 2009 at Queen Mary College, London, organized by the Scientific and Medical Network.
[33] David Bohm, *Wholeness and the Implicate Order*, London: Routledge, p. 176.
[34] Ibid., p. 49.
[35] Kabir, *Songs of Kabir: A 15th Century Sufi Literary Classic*, tr. Rabindranath Tagore, 1915, Boston, MA: Weiser Books, 2002, p. 91.
[36] Rees, *Our Final Century*, pp. 148–149.
[37] Dean Radin, *Real Magic: Ancient Wisdom, Modern Science, and a Guide to the Secret Power of the Universe*, Penguin Random House, 2018.
[38] Tim Freke, *The Mystery Experience: A Revolutionary Approach to Spiritual Awakening*, London: Watkins Publishing, 2012, Kindle edition, location 606 of 5557.
[39] Deepak Chopra and Leonard Mlodinow, *War of the Worldviews: Science vs. Spirituality*, New York: Harmony Books, 2011.
[40] Paramahansa Yogananda, *Autobiography of a Yogi*, 1st ed., 1946, Los Angeles, CA: Self-Realization Fellowship, 1998, p. 3.
[41] Pierre Teilhard de Chardin, *The Human Phenomenon*, tr. Sarah Appleton-Weber, orig. pub. *Le phénomène humain*, 1955, Sussex Academic Press, 2003, pp. 216–218.
[42] Pierre Teilhard de Chardin, *Le Milieu Divin: An Essay on the Interior Life*, tr. Bernard Wall, *Le Milieu Divin*, Paris: Editions du Seuil, 1957, London: Fount, Collins, 1967, p. 9.
[43] Ursula King, *Spirit of Fire: The Life and Vision of Teilhard de Chardin*, Maryknoll, NY: Orbis Books, 1996, pp. 88–89.
[44] Ibid., pp. 116 & 174.
[45] Ibid., p. 227.
[46] http://www.catholicculture.org/culture/library/view.cfm?id=3160.
[47] P. B. Medawar, 'The Phenomenon of Man' in *The Strange Case of the Spotted Mice and Other Classic Essays on Science*, Oxford University Press, 1996, p. 1. Originally published as 'Critical Notice', *Mind* (1961) LXX (277): 99–106.
[48] P. B. Medawar and J. S. Medawar, *Aristotle to Zoos: A Philosophical Dictionary of Biology*, Harvard University Press, 1983, p. 133, article on 'Great chain of being'.
[49] Julian Huxley, Foreword to Pierre Teilhard de Chardin, *The Phenomenon of Man*, tr. Bernard Wall, 1st ed. 1959, Glasgow: William Collins, 1977, p. 21.
[50] Julian Huxley, 'Transhumanism' in *New Bottles for New Wine*, London: Chatto & Windus, 1957, pp. 13–17.
[51] Max More and Natasha Vita-More, eds., *The Transhumanist Reader: Classical and Contemporary Essays on the Science,*

Technology, and Philosophy of the Human Future, Wiley-Blackwell, 2013, p. 25.
[52] Vernor Vinge, 'The Technological Singularity', available at http://mindstalk.net/vinge/vinge-sing.html.
[53] Ray Kurzweil, et al, *Are We Spiritual Machines?: Ray Kurzweil vs. the Critics of Strong A.I.*, p. 11.
[54] Bohm, *Wholeness and the Implicate Order*, pp. 1 and 3–4.
[55] Plato, *The Republic*, 2nd ed., tr. Desmond Lee, 1st ed., 1955, Harmondsworth, England: Penguin, 1974, translator's note, pp. 263–267.
[56] Aristotle, *Metaphysics, Books I-IX*, tr. Hugh Tredennick, Cambridge: Harvard University Press; London: William Heinemann, 1933, 1003a21–23, p. 147.
[57] Hugo Pastijn, 'Chaotic Growth with the Logistic Model of P.-F. Verhulst', in *The Logistic Map and the Route to Chaos: From the Beginnings to Modern Applications,* eds. Marcel Ausloos and Michel Dirickx, New York: Springer-Verlag, 2010, pp. 3.
[58] D'Arcy Wentworth Thompson, *On Growth and Form*, Vol. I, 2nd ed., 1st ed. 1917, Cambridge University Press, 1942, p. 139.
[59] C. H. Waddington, *Tools for Thought*, Chapter 5, 'Processes in Complex Systems', London: Jonathan Cape, 1977, pp. 64–79.
[60] Niles Eldredge and Stephen Jay Gould, 'Punctuated Equilibria: An Alternative to Phyletic Gradualism', presented at the annual meeting of the Paleontological Society and the Geological Society of America, at Washington, D. C., on 2nd November 1971, and published in Thomas J. M. Schopf, *Models in Paleobiology*, Freeman, 1972, pp. 82-115.
[61] Robert M. May, 'Simple Mathematical Models with Very Complicated Dynamics', *Nature*, 1976, Vol. 261, pp. 459-67.
[62] James Gleick, *Chaos: Making a New Science*, London: Sphere Books, Cardinal, 1988, p. 63.
[63] Steven H. Strogatz, *Nonlinear Dynamics and Chaos: With Applications to Physics, Biology, Chemistry and Engineering*, 2nd ed., Boulder, CO: Westview Press, 2015, p. 380.
[64] Mitchell J. Feigenbaum, 'Quantitative Universality for a Class of Nonlinear Transformations', *Journal of Statistical Physics*, Vol. 19, No. 1, 1978, p. 30.
[65] Mitchell J. Feigenbaum, 'Universal Behavior in Nonlinear Systems', *Los Alamos Science*, 1980, Vol. 1, pp. 4–27, p. 5
[66] Carl Johan Calleman, *The Mayan Calendar: Solving the Greatest Mystery of Our Time*, Coral Springs, FL: Garev Publishing International, 2001, p. 77.
[67] Vimala Thakar, *Spirituality and Social Action: A Holistic Approach*, Vimala Programs California, 1984, pp. 3–4.
[68] Ibid., p. 13.
[69] Gary Younge, 'Brexit is not the cause of Britain's political breakdown. It's a symptom.' *The Guardian*, 21st March 2019. https://www.theguardian.com/commentisfree/2019/mar/21/brexit-political-crisis-britain
[70] Eckhart Tolle, *Stillness Speaks: Whispers of Now*, London: Hodder Mobius, Hodder & Stoughton, 2003, p. xii.
[71] George Monbiot, 'How the media let malicious idiots take over', *The Guardian*, 22nd March 2019. https://www.theguardian.com/commentisfree/2019/mar/22/political-monsters-media-jacob-rees-mogg-platforms.
[72] Ken Wilber, *The Spectrum of Consciousness*, 2nd ed., 1st ed., 1977, Quest Books, 1996.
[73] Ken Wilber, *Integral Spirituality: A Startling New Role for Religion in the Modern and Postmodern World*, Boston: Shambhala Publications, 2006, plates between pp. 68 and 69.
[74] Andrew Cohen and Ken Wilber, 'The Leading Edge of the Leading Edge: An Exploration of the Emerging Potential of Third Tier', *What is Enlighenment?*, Issue 38, October–December 2007, p. 88.
[75] Alexis de Tocqueville, *Democracy in America*, tr. George Lawrence in 1966 and ed. J. P. Mayer in 1969, originally published as *De la démocratie en Amérique* in two volumes in 1835 and 1840, London: Fontana Press, 1994, section 'Tyranny of the Majority', pp. 250–253.
[76] John Stuart Mill, *On Liberty*, ed. Elizabeth Rapaport, 1st ed., 1859, Indianapolis: Hackett, 1978, p. 51–52.
[77] J. Krishnamurti, *Education and the Significance of Life*, 1st ed., 1953, HarperSanFranscisco, 1981, p. 18.
[78] Henryk Skolimowski, *Let There Be Light: The Mysterious Journey of Cosmic Creativity*, New Delhi: Wisdom Tree, 2010, p. x, and *The Song of Light: Meditations on Lumenarchy*, Michigan: Creative Fire Press, 2013.
[79] Joseph Campbell, *The Hero with a Thousand Faces*, 2nd ed., 1st ed., 1949, Princeton University Press, 1968, p. 259.
[80] Ibid., p. 30.
[81] Fritjof Capra, *The Turning Point: Science, Society and the Rising Culture*, London: Wildwood House, 1982, p. 8.
[82] M. King Hubbert, 'Nuclear Energy and the Fossil Fuels', Shell Development Company, Publication No. 95, June 1956, published in *Drilling and Production Practice*.
[83] M. King Hubbert, 'Energy Resources: A Report to the Committee on Natural Resources of the National Academy of Sciences—National Research Council', Publication no. 1000-D, *National Academy of Sciences*, Washington, DC, 1962.
[84] 'Catastrophic Feedback Loops - Runaway Climate Change', GlobalClimateNews, YouTube channel, 23rd April 2018, https://youtu.be/O80MpbiDXhQ.
[85] Matthew Fox, Foreword to Andrew Harvey and Carolyn Baker, *Savage Grace: Living Resiliently in the Dark Night of the Globe*, Bloomington, IN: iUniverse, 2017, p. 4.
[86] Harvey and Baker, *Savage Grace*, location 212 of 2391, Kindle edition.
[87] Bohm, *Wholeness and the Implicate Order*, pp. 115–116.
[88] Campbell, *Hero with a Thousand Faces*, pp. 229–243.
[89] Rumi, *Rumi • Fragments • Ecstasies*, tr. Daniel Liebert, Cedar Hill, MT: Source Books, 1981, p. 31.
[90] Eknath Easwaran, tr., *The Bhagavad Gita*, Harmondsworth, England: Penguin, Arkana, 1986, p. 35.