

Chapter 5

An Integral Science of Causality

Knowledge is power.

Francis Bacon

Although Integral Relational Logic emerged to explain why scientists and technologists are driving the pace of change in society at exponential rates of acceleration, IRL, in itself, does not address this issue directly for three main reasons.

First, studying causality inevitably involves time. But time is a concept treated in exactly the same way as all other concepts in egalitarian IRL. For we cannot be consistent in our thinking if we treat time any differently from any other concept, as explained on page 142 in Chapter 1, ‘Starting Afresh at the Very Beginning’. So, IRL, as such, cannot tell us anything about causality, not even what caused it to come into existence.

Secondly, faced with the imminent death of the global economy and the human race, the mystical became of paramount importance. Having consciously reached the Omega point of evolution at the end of time in the spring of 1982, my top priority was to find a way of dealing with this awesome vision with equanimity.

Thirdly, inspired by David Bohm, I realized that before I could be of any use to humanity in its moment of crisis, I needed to heal my fragmented, split mind in Wholeness, healing the deep schism between reason and mysticism, which many cognoscenti say is impossible.

Based on this exquisite sense of Wholeness, it is thus the first task of the Unified Relationships Theory to develop a holistic science of causality that can explain why events happen in the Universe, wherever this is possible, not the least, what is causing us human beings to behave as we do. Although such a holistic science has been gestating for thirty years, this chapter is one of the last to be written, for some of the reasons explained above. So without losing touch with mystical Love, Intelligence, and Consciousness, we now need climb down from the summit of the mountain of all knowledge and start afresh at the very beginning once again, this time looking at the Universe from a causal perspective in the two dimensions of time.

For as Brian Greene has said, the essence of the much sought-for theory of everything, which Einstein called a ‘unified field theory’, is “a theory capable of describing nature’s forces within a single, all-encompassing, coherent framework.”¹ Of course, physicists can never solve the ultimate problem in science because they only recognize physical causes, not psychospiritual ones, which are of primary importance. It is not until we have developed a comprehensive model of the psychodynamics of society as a whole that we can fully understand the dynamics of the physical universe, including the way that the brain and the DNA molecule function.

So what is causality? Well, dictionaries define *causality* as the relationship between cause and effect, the principle that everything has a cause. *Cause* itself derives from Old French *cause* ‘matter, thing’, from Latin *causa* ‘cause, reason, motive; interest; law-suit; case (different root)’, from *causare* ‘to cause’ and *causari* ‘to give as a reason’, related to the conjunction *because* ‘by cause, for the reason that’. Other causal meanings derive from *causātiō-em* ‘excuse, pretext’, root of *causation* ‘the action of causing, the operation of causal energy’. Another Latin word whose root was *causa* was *causārius* ‘sickly, diseased’.

We can thus see that the history of causality has been concerned at least with providing scientific explanations why events happen in the way that they do, with finding legal and ethical reasons and justification for people’s actions, and with discovering the aetiology of disease from the observed or felt symptoms. *Aetiology* ‘assignment of a cause, study of causation’ derives from Greek *aitia* ‘cause, reason’. However, how people have interpreted the supposed relationship between causes and effects over the ages has varied widely with whatever worldview and personal prejudices have informed their explanations.

But today, Integral Relational Logic, as the universal science of reason that shows how all beings in the Universe are related to each other, can, in principle, provide an integral explanation for all causal effects, so far as this is possible.

In studying causality in this integral manner, we should not forget that our minds create our reality. So the URT is first and foremost a science of the inner, and, as such, places psychology as the primary specialist science, before physics and biology. In putting Western thought back on its feet in this way, we obviously shall make radical changes to the concepts of energy and life, as they are understood by materialistic science today.

The second of these changes is much simpler than the first, even if neither is particularly easy given the way that we have been culturally conditioned over the millennia. Figure 5.1, another way of depicting the two dimensions of time in Figure 4.11 in Chapter 4, ‘Transcending the Categories’ on page 272, illustrates the holistic principles involved in this transformational exercise. The metaphysical, coordinating framework is IRL, which shows that the all-inclusive Cosmic Context for all our lives is Consciousness and that the secure Gnostic Foundation that we all share is Love, our Divine Essence. The vertical line in this

diagram thus represents the transcendent and immanent aspects of the Immortal Absolute or Divine Cosmos, a seamless continuum with no borders or divisions anywhere. We can then see that all structures and relationships in the relativistic world of form arise from Ultimate Reality as abstractions from or appearances in Consciousness, which is essentially an Eastern worldview. The simplest way to explain this in Western terms is that Life—arising directly from our Divine Source in the vertical dimension of time, like a fountain—is the Ultimate Cause of everything that exists in the manifest world.

The situation gets somewhat more complicated when we look at the way that structures interact with each other in the relativistic world of form in apparently causal, acausal, and spontaneous relationships. Over the years, many different words have been defined in English to denote causal relationships. In human terms, these include *wish, want, desire, covet, like, will, hanker, pine, hope, longing, yearning, and craving*. More generally, these are just some of the words that denote causation: *energy, force, might, potency, power, strength, and action*. So how can we make sense of all this confusion?

Well, in general, as nothing exists in the Universe except meaningful structure-forming relationships

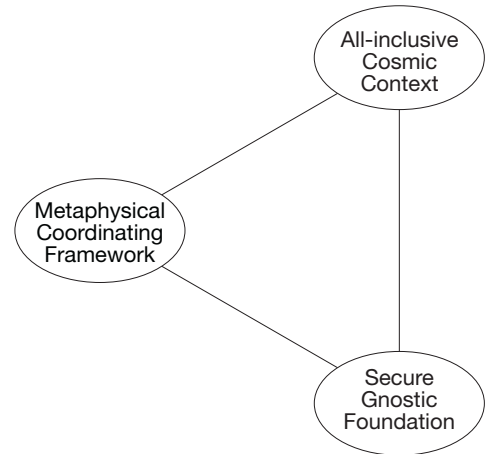


Figure 5.1: *Holistic context, framework, and foundation*

and their opposite—chaotic confusion—structures are causal, as David Bohm told me when I met him for the first time in November 1980.² During the previous summer, following the idea that data in all its forms is energetic, Figure 5.2 shows the relationships of some key concepts in my mind at that time. As I was to write a couple of years later, when I first attempted to write the book you are reading now, “Because of the emphasis on materialism in science and society today, the bond between matter and energy was so strong in my mind that I could not break it and link energy with structure.”³

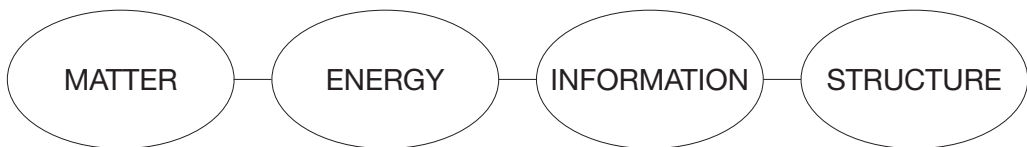


Figure 5.2: *Association of causal concepts in 1980*

Even though I was well familiar with the synergy of structure from my job as an information systems architect in business, I could not see that structure is the unifying causal principle in the Universe, whether structures are nonphysical or physical, as illustrated in Figure 5.3. However, after this major breakthrough, I was able to continue building a coherent model of

all knowledge in the Universe with renewed confidence. The major task then was to learn David Bohm's theory of the Implicate Order in order to develop a holistic science of causality, as this chapter begins to outline.

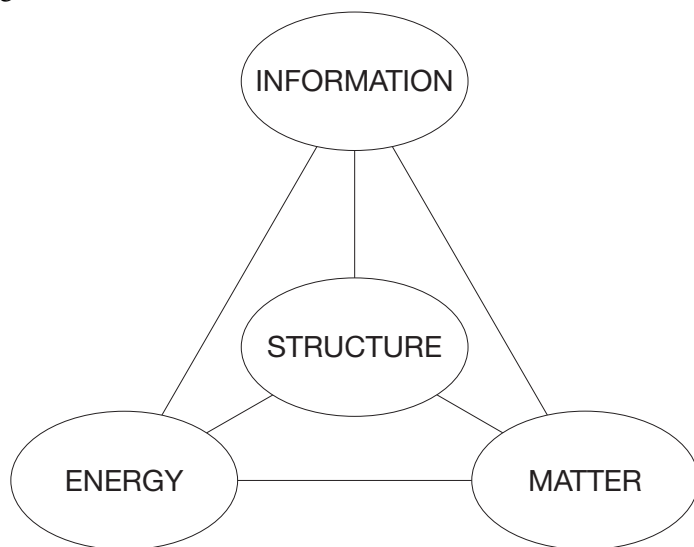


Figure 5.3: *Association of causal concepts after David Bohm meeting*

Now the primary purpose of developing such a holistic science is to use the concept of structural energy to enable us to intelligently and synergistically adapt to the most momentous turning point in evolution's fourteen billion-year history, which we outline in systems theory terms in Section 'A systems perspective' in Chapter 6, 'A Holistic Theory of Evolution' on page 559. As we now live in an Information Age or Knowledge Society, we can best begin this self-inquiry by exploring some key aspects of the meaning of information, free of all previous energetic concepts of causality. For we cannot adapt to the unprecedented rate of evolutionary change that we are currently experiencing by holding on tenaciously to the status quo. The only viable way forward for humanity is Total Liberation, releasing the mystical core of Being from the thick, billowing clouds of unknowing.

What this means is that if we are to coherently understand causality in all its manifestations, we need to undergo a profound transformation of consciousness, as I have experienced during the thirty or more years that I have been studying the meaning of information as an information systems architect. In my case, this total transformation has led my fragmented mind to be healed in Wholeness, enabling individual consciousness to expand and deepen to such an extent that it has become coterminous with Consciousness itself. As Ramesh S. Balsekar tells us, the Buddhists have a wonderful metaphor to describe this awakening process.

First, mountains and rivers are seen as mountains and rivers. An individual identified subject is seeing an object. This is total involvement. This is what the ordinary person does.

Second, mountains and rivers are no longer seen as mountains and rivers. Objects are seen as the mirrored objectivization of the subject. They are perceived as illusory objects in Consciousness and therefore unreal.

Finally, mountains and rivers are once more seen as mountains and rivers. That is, on being awakened, they are known as Consciousness itself, manifesting as mountains and rivers. Subject and objects are not seen as being separate.⁴

What this means is that if we are to intelligently manage our business affairs with full consciousness of what we are doing, we now need to take the mystical into rational, systemic science and the business world, into the Information Age we live in today. To do this, we can most simply remind ourselves that **Being** rather than **Object** is the most abstract concept in IRL, the superclass for all other classes of concept, as we saw on page 167 in Chapter 1, 'Starting Afresh at the Very Beginning'. In the beginning, beings are just data patterns prior to interpretation by a knowing being, which we can look at as structures of forms and relationships, as we saw on page 180 in Chapter 2, 'Building Relationships', like mathematical graphs in Figure 1.14 on page 76 in Chapter 1, 'Starting Afresh at the Very Beginning'.

So following the first section on the meaning of information and of meaning, itself, we then explore a little the psychology of information as it affects our behaviour. Having then established the general principle that meaningful, structure-forming relationships are causal, whether they be physical or nonphysical, we can then use this as a framework to study the history of the science of causality.

There are really only two perspectives that we need to look at here. First is Aristotle's science of causality, which laid down the basic principles that were followed until Kepler's *New Astronomy* in 1609, as we see on page 929 in Chapter 11, 'The Evolution of the Mind'. (In a later edition of this book, we shall study the psychodynamics of society during the past three hundred years through the eyes of structuralism and semiotics, obviously closely connected with Integral Relational Logic and the first couple of sections in this chapter.)

This leads us to the modern view of causality, which we explore through the concepts of energy, synergy, and entropy, leaving the paradoxical, acausal effects of quantum physics to Section 'The surface of things' in Chapter 9, 'An Evolutionary Cul-de-Sac' on page 692. In effect, scientific materialism took over studies of causality, denying the existence of nonphysical causes, which have been experienced by human beings for millennia. If we are to understand why scientists and technologists are driving evolutionary change exponentially, we need to overturn this misconception with the utmost urgency.

But let us not forget that nothing that might be written about causality in this chapter or elsewhere is real in an absolute sense. For the entire world of form is merely an abstraction from Consciousness, the delightful play of the Divine, called *lila* in the East.

The meaning of information

Today, we live in an Information Society, identified as such in 1979 by the social scientist Daniel Bell, who first called today's predominant economic mode a 'post-industrial society'. This is how he defined information and knowledge at the time:

By information I mean data processing in the broadest sense; the storage, retrieval, and processing of data becomes the essential resource for all economic and social exchanges. ... By knowledge, I mean an organized set of statements of facts or ideas, presenting a reasoned judgment or an experimental result, which is transmitted to others through some communication medium in some systematic form.⁵

As what was ARPANET then has now spread into people's homes as the Internet, giving millions instant access to all the world's knowledge, this is even more obvious now than it was then, when I began investigating the meaning of information in order to develop a comprehensive model of the psychodynamics of society.

Yet even though we are deluged by information everyday from the Internet, television, newspapers, magazines, books, and, of course, each other and our natural surroundings, we take information for granted without giving it a second thought. So as information plays a central role in all our lives, if we are to intelligently manage our business affairs with full consciousness of what we are doing, we need to investigate further this mysterious being called information. So what is it and what is meaning?

Well, we saw on page 159 in Chapter 1, 'Starting Afresh at the Very Beginning' that information is data with meaning, data being 'that which is given', the 'raw' substance of the Universe prior to interpretation by a knowing being, for *substance* literally means 'standing under', from Latin *substantia* 'being, essential, matter', from the present participle of *substāre* 'to be present, to stand or be under', from *sub-* 'under' and *stāre* 'to stand'. In turn, information is that which informs, from Latin *informāre* 'to give form to, shape, fashion, form an idea of, describe', from *forma* 'form, figure, shape, mould, sort, kind', of uncertain origin, but perhaps an alteration through metathesis of Greek *morphē* 'form, shape'.

The basic meaning of *meaning* is 'intention, purpose', a verbal noun deriving from *mean*, from Old English *mānan* 'to tell of, to intend, signify', with various cognate Old Germanic words meaning 'mean, make known, have in mind, hold an opinion', from Proto-German **mainjain*. There is some disagreement between the etymological dictionaries about the original PIE base of *mean*. Some say that the PIE base is **mei-no-* 'opinion, intention', also root of *moan* 'complain'. An alternative base is **men-* 'to think', also root of *mind*, *mental*, *memory*, *mention*, *mania*, *music*, and *money*. The association of *meaning* with *interpretation* came about from the sense that in communications, we intend to convey a certain sense when using some word, sentence, or significant action. Conversely, we interpret what is being communicated as meaning, not necessarily what the communicator intended.

We can best see the association between meaning and purpose from the oft-asked question, “What is the meaning of life?” In other words, “Why are we here?”, “Where are we all heading?”, and “What is our ultimate destiny as a species?” These questions have puzzled humanity for thousands of years and we can see that few have found satisfactory answers to these fundamental questions of existence through such comedies as *The Hitchhiker’s Guide to the Galaxy*—originally a radio series, then a book by Douglas Adams, then a TV series and film—and Monty Python’s *The Meaning of Life*. For we like to laugh at that which we don’t know as a relief from the fear of the unknown.

In Adams’ novel and film, “Many millions of years ago, a race of hyperintelligent, pandimensional beings got so fed up with the constant bickering about the meaning of life that they commissioned two of their brightest and best to design and build a stupendous supercomputer to calculate the answer to Life, the Universe, and Everything.”⁶ With infinite majesty and calm, after seven and half million years of computation, the computer, called Deep Thought, gave this simple answer: “forty-two”. But the people did not understand the answer because they did not actually know what the question was. As Deep Thought said, “Once you know what the question actually is, you’ll know what the answer means.”⁷

In a not dissimilar fashion, the *What is Enlightenment?* magazine asked Vijai Shankar, an Advaita sage, former medical practitioner, and founder of the Academy of Absolute Understanding, for his answer to the most important spiritual questions of our time, the magazine’s motto at the time. The reply was intended for the Spring/Summer 2001 issue, whose theme was “Can enlightenment save the world?”, specifically asking a number of teachers of nonduality, “Does the world need to be saved?”⁸ This was Vijai’s reply, which was not published:

A question is merely a question. There is no such thing as a spiritual question. The rudiments of a question are to be questioned. If a question can be answered then it can no longer remain as a question. Which means it is not real, and that which is not real how can it be important? An answer too, if it is an answer should remain as such, which cannot be questioned. Find that one question which cannot be answered and that answer which cannot be questioned.⁹

The solution to this apparently intractable puzzle is readily available to anyone who becomes aware of self-reflective Intelligence, the Witness that can see everything, when the observer and observed become one. To illustrate this point, here are four stanzas from Eric Idle’s jolly ‘Galaxy Song’ in Monty Python’s ‘The Meaning of Life’.

*Just remember that you’re standing on a planet that’s evolving
And revolving at nine hundred miles an hour
That’s orbiting at nineteen miles a second, so it’s reckoned
A sun that is the source of all our power*

*The sun and you and me, and all the stars that we can see
Are moving at a million miles a day*

*In an outer spiral arm, at forty thousand miles an hour
Of the galaxy we call the 'Milky Way'*

*Our galaxy itself contains a hundred billion stars
It's a hundred thousand light-years side-to-side
It bulges in the middle, sixteen thousand light-years thick
But out by us it's just three thousand light-years wide*

*We're thirty thousand light-years from galactic central point
We go round every two hundred million years
And our galaxy is only one of millions of billions
In this amazing and expanding universe*

The first line of the second stanza here says that we can see the Sun and the stars. But then in the next two stanzas, there are a number of observations about the galaxy of which we are a part. Now who is the observer here? Clearly not direct eyesight. What is actually happening, as we saw in Subsection 'Maps and territories' in Chapter 1, 'Starting Afresh at the Very Beginning' on page 71, is that the mind creates a model of the physical universe, enabling us to see the relationship of our Sun to the rest of the Milky Way Galaxy, and, in turn, our galaxy's relationship to the other galaxies in the physical universe.¹⁰

By taking this expansion of consciousness to its ultimate conclusion, like an out-of-body, near-death experience, we can view the Totality of Existence as a coherent whole with self-reflective Intelligence and see with the Cosmic Light that enlightens the Cosmos that Consciousness is the Universe, not the physical universe. In other words, there are extraterrestrial beings living on Earth in human form who do not belong anywhere on the planet for they are Divine, Cosmic beings, able to stand outside themselves in Wholeness. And this tells us that we are not alone and that there is, indeed, intelligent life on Earth, despite the final stanza of the song.

*So remember, when you're feeling very small and insecure
How amazingly unlikely is your birth
And pray that there's intelligent life somewhere up in space
Because there's bugger all down here on Earth*

So what does this Holoramic perspective really tell us about the meaning of life? Well, by the Principle of Unity, all structures that emerge from the Immortal, Formless Ground of Being are born to die, or, in the case of human beings and the other animals, conceived to die. But before this happens, structures evolve to their fullest extent, fulfilling their particular potential, whether this be as a species, civilization, galaxy, microbe, or whatever, schematically illustrated by the life and death curve in Figure 5.4. It is pertinent to note that materialistic, mechanistic science has no explanation for the creative processes depicted in the left-hand

side of this curve, investigated further in Subsection ‘The growth curve’ in Chapter 6, ‘A Holistic Theory of Evolution’ on page 538, focusing its attention on the right-hand side, as described in Section ‘Energy, synergy, and entropy’ on page 507.

Now we are the first species to become aware of the inevitable mortality of structures, leading to great consternation in the human population for tens of thousands of years. To overcome any suffering that might arise from the fear of death, mystics like Shakyamuni Buddha have discovered that if we pass through a psychological death of the sense of a separate ego before the death of our bodies, we can live in the bliss of complete union with

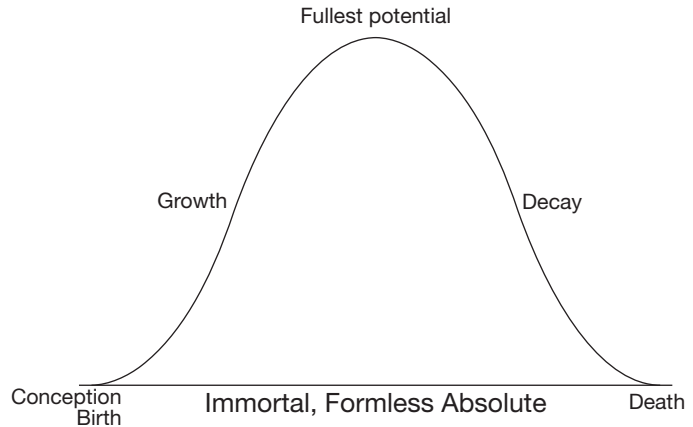


Figure 5.4: Schematic of life and death of structures

the Divine. This ontogenetic process of *samsāra* ‘journeying’ culminates in *Nirvāna* ‘extinction’, *Moksha* ‘liberation’, *Kaivalya* ‘Absolute Consciousness’, and *Satchidananda* ‘the bliss of Absolute Consciousness’, depicted in the small bell curve in Figure 4.13 on page 275 in Chapter 4, ‘Transcending the Categories’.

However, humanity faces a quite unprecedented situation today. Evolution is currently passing through its accumulation point in systems theory terms, the most momentous turning point in some fourteen billion years of evolution, outlined in Section ‘A systems perspective’ in Chapter 6, ‘A Holistic Theory of Evolution’ on page 559, leading to the end times of the human race, foreseen by visionaries of all ages. But very few are yet aware of this evolutionary inevitability, mostly following the outward path labelled ‘Western civilization’ in Figure 4.13, accelerating away from Reality with every year that passes. So if humanity is to deal with any suffering that might arise from the imminent death of *Homo sapiens sapiens*, the entire species needs to pass through a phylogenetic psychological death, not only of the individual ego, but also of identification with humanity, the Earth, and the galaxy, galaxy of galaxies, and physical universe of which we appear to be a part.

If this could happen, the Information Age we live in today would mark the transition period between the end of the mental-egoic period (me-epoch) and the beginning of the age of universal spirituality (us-epoch), fulfilling Pierre Teilhard de Chardin’s prophesy, outlined on page 523 in Chapter 6, ‘A Holistic Theory of Evolution’. We explore the possibilities of this liberating process happening at a global scale in the last couple of chapters of Part III, ‘Our Evolutionary Story’: Chapter 13, ‘The Prospects for Humanity’ on page 1027 and Chapter

14, ‘The Age of Light’ on page 1131. But first, we need to go right back to basics, to become as conscious as possible of what we mean by the meaning of information. For this can help us understand the meaning of life, an understanding that has eluded humanity throughout its history.

Now as we saw from the root of *information* on page 488, the purpose of information is to inform, to give form to. And as forms are ubiquitous, it is not surprising that their study, called morphology, from Greek *morphē* ‘form, shape, figure, appearance; beauty, grace’, appears in a wide variety of disciplines, such as linguistics, biology, and even folktales.¹¹ Appropriately enough, in linguistics, the basic unit of meaning is the morpheme, composed of phonemes and graphemes, the smallest distinctive units of sounds and signs in written language.

For instance, let us take the letter *a*, which generally denotes an open or near open vowel sound, like /æ/, as in *cat*, and /ɑ:/, as in *father*. A word like *bath* can be pronounced with either sound depending on where one is brought up. In other European languages, *a* is more rounded, pronounced as /a/ or /a:/, as in French *patte* or *gare*, respectively. However, because of the Great Vowel Shift between 1450 and 1750,¹² *a* can also be pronounced as a diphthong /eɪ/, as in *name*.

Figure 5.5 shows the relationship of these vowels to all the major vowels in the notation of the International Phonetic Alphabet (IPA). You can see that vowels have three basic attributes with domains of values ‘open to close’, ‘front to back’, and ‘rounded or unrounded’, once more illustrating the way that we all use IRL to organize our ideas. A fourth attribute—short and long—is denoted by postfixing ‘?’ to the basic sign. Other attributes, such as stress and tone, are denoted with diacritics on the basic signs.

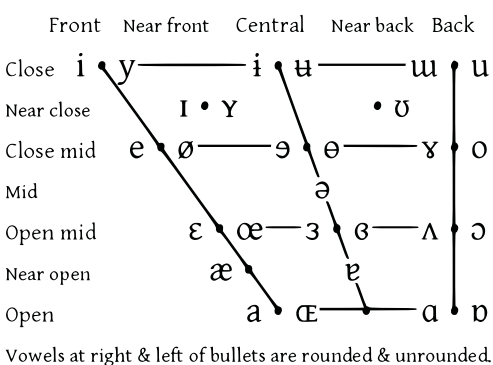


Figure 5.5: Vowel signs in International Phonetic Alphabet

One other key point to note about letters is that when we read them, we take in the entire sign as a whole. The word *gestalt*, from the German *Gestalt* ‘form, shape, pattern’, represents this sense of wholeness very well, for it denotes “a shape, configuration, or structure that as an object of perception forms a specific whole or unity incapable of expression simply in terms of its parts,” or “a physical, biological, psychological, or symbolic configuration or pattern of elements so unified as a whole that its properties cannot be derived from a simple summation of its parts”, to give another dictionary defini-

This emphasis on the wholeness of forms led Max Wertheimer (1880–1943), Wolfgang Köhler (1887–1967), and Kurt Koffka (1886–1941) to found a school of gestalt psychology in the early twentieth century. Wertheimer emphasized that the Gestalt is perceptually primary, defining the parts of which it was composed, rather than being a secondary quality that emerges from those parts,¹⁴ a notion not unlike Aurobindo’s concept of Supermind: “The Supermind is the Vast; it starts from unity, not division, it is primarily comprehensive, differentiation is only its secondary act.”¹⁵ In the words of *Encyclopædia Britannica*:

Gestalt theory originated in Austria and Germany as a reaction against the associationist and structural schools’ atomistic orientation (an approach which fragmented experience into distinct and unrelated elements). Gestalt studies made use instead of phenomenology. This method, with a tradition going back to Johann Wolfgang von Goethe, involves nothing more than the description of direct psychological experience, with no restrictions on what is permissible in the description. Gestalt psychology was in part an attempt to add a humanistic dimension to what was considered a sterile approach to the scientific study of mental life. Gestalt psychology further sought to encompass the qualities of form, meaning, and value that prevailing psychologists had either ignored or presumed to fall outside the boundaries of science.¹⁶

Then in the 1940s, Frederick S. Perls (1893–1970), better known as Fritz Perls, and his wife Laura (1905–1990) turned this emphasis on the perception of phenomena inwards, founding Gestalt therapy, “a humanistic method of psychotherapy that takes a holistic approach to human experience by stressing individual responsibility and awareness of present psychological and physical needs”.¹⁷ Perls and his family lived in South Africa from 1933 to 1946 and were much influenced by the holistic evolution of Jan Smuts,¹⁸ focusing particular attention on how human beings could realize their fullest potential. For as Perls wrote in 1969, “Unfortunately in our time the average person uses only 10 to 15 percent of his potential; a person who uses 25 percent is already called a genius.” Continuing, he said that people, as representatives of a social mores, spend more time in telling others what to do than in listening to their needs. Seeing therapy through the gestalt concept of growth, Perls said, “I now consider that neurosis is not a sickness but one of several symptoms of growth stagnation,”¹⁹ a critical life-and-death issue we look at in more detail in Chapter 13, ‘The Prospects for Humanity’ on page 1027.

In the meantime, let us return to the basic units of language and look at how designers of typographic fonts view letters. To design glyphs, they need to analyze signs into segments of curves and lines and then put them together in an aesthetic and functional manner, as illustrated in Figure 5.6. Here, the familiar Times letter *a* is formed by the space between two closed curves, consisting of nodes and the arcs between them, like the mathematical graph of Figure 1.13 on page 75.

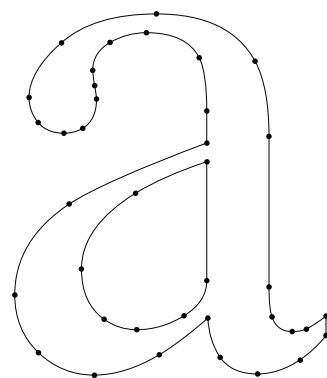


Figure 5.6: *Times letter a*

This example of designing fonts by analysis and synthesis is typical of all creative processes in both the arts and sciences. It also marks the difference between holistic and reductionist science. In the latter, researchers focus more attention on analysis, without always considering the connections between the constituents, throwing the interesting relationships away. Indeed, because evolution has been more divergent than convergent during the thousands of years in which the mind has been evolving, we all act rather like reductionist scientists, becoming identified with a religion, nation, political ideology, specialism, occupation, sex, or whatever, to the exclusion of other members of these classes.

We can overcome this fragmentation by noting that what holds for the humble letter *a* holds for every other structure in the manifest world of form, including the Totality of Existence, which, when viewed as a Whole, is Formless. For when we see, feel, and sense the Absolute as a seamless, borderless continuum, the notion that we are separate from the Divine, Nature, and each other disappears completely. Wholeness is all-inclusive, with nothing left out. Furthermore, as we always need a context for interpretation, Wholeness provides the overall Cosmic Context for determining the meaning of all data patterns in experience, with no division between science and mysticism, for instance.

Returning to our journey towards Wholeness through a holistic science of causality based on the notion of the meaning of information, we now need to look at words, consisting of one or more morphemes. For instance, the words *cat* and *act* consist of three letters in sequence, conveying different meanings, representing different concepts in the meaning triangle in Figure 1.32 on page 126. In contrast *tca* is not a word in the English language and conveys no meaning other than as a set of initials. So meaning is inextricably connected with order.

This association between meaning and order becomes even clearer when we look at sentences as strings of words, like “The cat sat on the mat.” Even putting these words into alphabetical order as “cat mat on sat the the” conveys no direct meaning. We can extend this meaningful ordering principle to paragraphs, sections, chapters, books, and every book that has ever been written or ever will be written in any language whatsoever. Integral Relational

Logic and the Unified Relationships Theory show how we can bring all this knowledge into universal order and hence discover the elusive meaning of life on this planet.

The psychology of information

However, as the words, formulae, and figures in this book are a product of a lifetime of study, courageously questioning the assumptions and preconceptions of Western civilization and its Eastern counterparts, it is uncertain how meaningful the signs and symbols in this book might be. One key issue in developing a holistic science of causality is that physics is widely regarded as the primary science and that all human behaviour can ultimately be explained in terms of the supposedly inviolate laws of physics within materialistic, mechanistic science. However, it is obvious to anyone who has inquired deeply into the causes of human behaviour that psychology is the primary, specialist science, on which the so-called natural sciences could be built.

We can help put Western civilization back on its feet by further exploring the meaning of information from a psychological perspective. We can simply begin here with an example I used in 1981, when writing a working paper called 'The Information Society': a railway timetable. Today most timetables, whether they be for railways, buses, aircraft, or ferries, are available in electronic form. But at that time, railway timetables were still printed, just as they had been since George Bradshaw (1801–1853) first published his famous timetables in 1839, often referred to as a 'Bradshaw', as a generic name for any railway timetable in the literature.²⁰

So how does the printing provide us with information about train times? Well, this information consists of particles of ink, which are made up of molecules and atoms, which in turn consist of a variety of sub-atomic particles, with attributes like charm and strange, where particles of matter can have attributes with integral fractions of spin and electric charge, as we see from Figure 9.9, 'Part of standard model of fundamental particles and interactions' on page 693. We have moved into the mysterious realm of quantum physics, which clearly cannot answer our question. Information is not in the material of the ink.

Where then is it? Well, we saw on page 492 that the meaning of information derives from the shape, form, and order of the particles of ink on the page. These forms consist of a letters, numbers, and other signs that are laid out on the page in such a way that they provide us with the information that we seek. A random sprinkling of ink would not provide us with any information, even though the mass of the ink might be the same as in the railway timetable.

We are thus faced with the essential problem of information. It is not a material thing and so materialistic science can tell us nothing directly about the Information Society we live in today. Information is a property of the material of the ink, in the timetable example, but also, in some senses, independent of it, for we can also store exactly the same information in electronic form. While we can hold the timetable in our hand, we perceive the information it con-

tains in our mind. Information is thus a conceptual property of the material, not a physical one. Of course, matter is also a concept in the mind, but we don't usually think of it in this way. Matter is something apparently solid outside us, not something that we envisage. So while information is intangible, the concept of information is somewhat impalpable, which is why scientists who are not fully engaged in self-inquiry don't know what information is or where it ultimately comes from.

The basic point about a railway timetable is that we use the information that it provides us with to take action, to decide on which train best meets our need. As such, the meaning of information can be said to be causal. Let us take another simple example. When driving a car towards a busy crossroads, if we see the traffic lights ahead change from green to amber to red, we slow down and stop. For we know from visualization, if not experience, that to proceed would be dangerous as other drivers, cyclists, or pedestrians are about to pass through the intersection. We are thereby reminded that we are not alone in the world; we need to give and take if society, as a whole, is to run smoothly. As we do not always act as individuals in this socially aware manner, to enforce this systemic principle, governing authorities have made it illegal to jump the lights at red.

To ensure that traffic moves as smoothly and safely as possible, traffic regulators have also designed a variety of control systems at different levels of complexity. At the simplest level, the lights pass through a cycle of states—most commonly four—at regular intervals. However, sensors, either buried in the road or over-roadway ones, can detect the presence of vehicles about to pass through the intersection. Using appropriate algorithms, a computer can then minimize drivers' waiting times at slack times and optimize the flow at busier times.²¹

Although as human beings we can see and feel ourselves as Divine beings living in the vertical dimension of time in the Eternal Now, as drivers, in this instance, we act essentially as machines, like a thermostat that turns an oven off and on again as the temperature rises above or drops below a set threshold in a cybernetic feedback mechanism. Using the fundamental principle of concept formation in IRL—noticing the essential differences and similarities in the data patterns of our experience—we can see that this mechanical process is essentially a three-step one:

1. We receive information.
2. We make a decision.
3. We take action.

This information-decision-action process is a common feature of information wherever it is used. To give a few simple examples that I used in the early 1980s before my mystical experiences had deepened to the extent they have reached today: if we hear on the radio that there is an airline strike, we may decide to postpone our journey or take an alternative route; if we

see that it is raining, we decide to take an umbrella when going out; if we feel that it is cold, we put the fire on; and if we look at a chair, we know that it is not a banana and decide to sit on it, rather than eat it.

We use all our senses to receive information from a wide variety of sources, both inner and outer. At the superficial level, our senses can be considered communications channels. When we communicate with each other, our principal input and output channels are reading and listening and writing and talking, respectively. However, we also communicate with each other in more subtle ways. For instance, Desmond Morris illustrates how we can often use gesture to communicate information to each other.²² These gestures have a major influence on our relationships with each other, which are often subconscious.

The action we take on receiving information need not therefore be physical or conscious. Neither need it be immediate. We could store information and delay our action to a more appropriate time. The most obvious example is the education system. Here, the information children receive from the cultures they are born into, both in and out of the classroom, serves to determine actions later in life. As a result, we have all been conditioned to behave in mechanistic ways that are inappropriate for our times, which we explore further in Chapter 13, 'The Prospects for Humanity' on page 1027.

These are all examples of actions arising from decisions in the mind. However, there really is no essential difference between a decision to walk and the reflex action of a knee on being tapped by a hammer. These actions just arise from different structures in the body-mind-spirit organism, which are also similar to the conditioned reflex of Pavlov's dog. In turn, what is the difference between the action of an animal deciding to mate when it sees the display characteristics of its partner; or birds deciding to migrate and then deciding the distance and direction in which they will travel; or the action of a plant deciding to grow when the sun's rays warm the soil?

We can consider all these to be examples of systems communicating information between and within themselves. So we are beginning to see that not only can any form or structure in the Universe be considered as information, but also that all these forms and structures are interrelating with each other, emphasizing the point that the entire Universe can be seen as an information system.

But what we are particularly concerned about at the moment is to look at the psychology of information, since such a study helps us understand the psychodynamics of society as a whole and hence the prospects for our future well-being and survival. Specifically, while meaning is evidently causal in general, what meaning we give to specific data patterns is obviously dependent on a whole host of psychological factors, not the least on how far we have developed up the various levels in the spectrum of consciousness illustrated in Figure 13.17 on page 1064. And, of course, if our lives are based on one or more of the seven pillars of

unwisdom, then we are likely to interpret data patterns in a quite different manner from those who live by the seven pillars of wisdom, listed in Section ‘Seven pillars of unwisdom and wisdom’ on page 477.

The seven pillars of unwisdom are based on the assumption that we human beings are separate from each other, which can lead to gross distortions in the way we use information and communicate with each other. The moral philosopher Sissela Bok has deeply explored some of the central issues here in her classic books *Lying: Moral Choice in Public and Private Life* and *Secrets: On the Ethics of Concealment and Revelation*.²³ To set the scene, she begins *Lying* with these familiar questions:

- Should physicians lie to dying patients so as to delay the fear and anxiety which the truth might bring them?
- Should professors exaggerate the excellence of their students on recommendations in order to give them a better chance in a tight job market?
- Should parents conceal from children the fact that they were adopted?
- Should social scientists send investigators masquerading as patients in order to learn about racial and sexual biases in diagnosis and treatment?
- Should government lawyers lie to Congressmen who might otherwise oppose a much needed welfare bill?
- Should journalists lie to those from whom they seek information in order to expose corruption?²⁴

As Bok says, we all have to grapple with such problems in our personal lives, a subject that had been little studied until she wrote her book. However, she doesn’t mention that Western civilization is based on a collection of lies that are based on the false belief that we human beings are separate from the Divine, Nature, and each other. In scientific terms, these lies lead to the second to fourth pillars of unwisdom that underlie Western civilization: the belief that the physical universe is the Universe, that Life is a property of the DNA molecule, and that human beings are machines and nothing but machines.

It is not only science that is based on lies. Politicians, competing against other politicians and seeking to manipulate the public to their point of view through functionaries called ‘spin doctors’, are not renowned for telling the truth, often turning to the persuasive power of numbers. The way that statistics are sometimes used to bolster weak arguments is encapsulated in a phrase that Mark Twain attributed to Benjamin Disraeli (1804–1881): “There are three kinds of lies: lies, damned lies, and statistics.”²⁵

So as our scientific, medical, and political explanations about what is happening in the world today are often based on lies, how can we possibly answer moral questions until we have answered the more fundamental question “What is truth?”, which has puzzled philosophers and religionists for millennia. For how can we answer this question if we are not actively engaged in the search for Truth, the Absolute Truth? And here, it is absolutely essential to be honest in our self-inquiries; otherwise we just fool ourselves.

In *Secrecy*, Bok points out that lying and secrecy intertwine and overlap. “Lies are part of the arsenal used to guard and to invade secrecy; and secrecy allows lies to go undiscovered and to build up.” She continues:

Lying and secrecy differ, however, in one important respect. Whereas I take lying to be *prima facie* wrong, with a negative presumption against it from the outset, secrecy need not be. Whereas every lie stands in need of justification, all secrets do not. Secrecy may accompany the most innocent as well as the most lethal acts; it is needed for human survival, yet it enhances every form of abuse. The same is true of efforts to uncover or invade secrets.²⁶

We don’t need to look in detail at the many concrete examples of secrets and lies that Bok examines in her books, for they are all examples of the general pattern of either-or issues, such as right or wrong and benefit or harm. And who can say what is right or wrong in any particular instance? For what might seem to be a misfortunate, unfavourable situation at any one moment could well turn out to be a blessing in disguise.

However, perhaps we can pause for a moment to consider the relationship of secret societies to the aim of this book to uncover the innermost secrets of the Universe, especially the Hidden Harmony: the Principle of Unity, *Wholeness is the union of all opposites*. The word *secret* derives from Latin *sēcrētus*, past participle of *sēcernere* ‘to separate, divide off’, from *sē* ‘apart’ and *cernere* ‘to separate’, also root of *secretary*, originally ‘a person in someone else’s confidence, sharing secret or private matters with them’.

We can see from the root of *secret* why it is so difficult to reveal the Hidden Harmony that underlies the Universe. Because of the first pillar of unwisdom, it is one of the most entrenched taboos in many cultures to say, “I am That,” as Nisargadatta Maharaj did in a classic spiritual book of this name. So those who have sought to come into union with Reality, which is how Evelyn Underhill (1875–1941) defined a mystic,²⁷ have often needed to meet in secret.

One of the first secret societies was the Pythagorean Brotherhood in Croton in the ‘front heel’ of southern Italy, which Pythagoras of Samos (c580–c500 BCE) founded about 525 BCE. However, about 25 years later, those who resented the secrecy and elitism of this club attacked the brotherhood, and Pythagoras fled and died in Metapontum, in the ‘arch’ of Italy’s foot.²⁸

However, this mystical school was far from being the first in Ancient Greece. The most famous of the secret religious rites were the Eleusian Mysteries, related to Demeter, the Mother Goddess of the Earth, who went to Eleusis in search of her daughter Persephone. There, she tried to make the son of the royal family immortal and eternally young, but was prevented from doing so by the queen’s fear. After this, she revealed her true identity and commanded that a temple be built for her, a story with several variations.²⁹

At the supposed time of these events, some 3,500 years ago, the analytical mind was beginning to take people away from their Immortal Ground of Being, leading some to attempt to return Home to the Divine through rituals and initiation ceremonies. But such a spiritual

journey was not for everyone, so these rites had to be kept secret, the origin of *mystery*, which derives from Greek *mustērion* ‘secret rite or doctrine’, from *mustēs* ‘one initiated’, from *mūein* ‘to close one’s eyes’. It seems that this association of mystery with closing the eyes was not because the divine mysteries would be revealed in meditation, as in the East, but because only those already initiated were permitted to witness the secret rites. So seekers coming to initiation would need to keep their eyes shut during the ceremony.

Today, spiritual seekers of gnosis do not normally try to keep their activities secret, even though the level of intolerance towards them from fundamentalist theists and atheists is as high as it has ever been. However, there are still a multitude of secret societies in the world that have evolved from these ancient mystical schools. One such are the Freemasons, dramatized by Emanuel Schikaneder and Wolfgang Amadeus Mozart in *The Magic Flute* ‘*Die Zauberflöte*’. An initiation ceremony is depicted in the opera as a trial of fire and water, which Tamino and Pamina undergo, protected by the magic flute, before they are united. As Joseph Campbell eloquently describes in *The Hero with a Thousand Faces*, such a trial is recounted over and over again in the myths and folktales of all cultures and ages. For who knows what demons we might discover when we dive below the surface into the depths of the Cosmic Psyche?

We can see the effects of our ignorance of the sub- and unconscious energies that cause us to behave as we do in a multitude of different ways. For instance, still keeping to the theme of secrecy, what is it about information that if you give away or steal a nation’s secret information, you can be called a traitor or a spy and either executed or given life imprisonment without parole? Such types of information gives nations power over others, which can be threatened by whistleblowers, such as Wikileaks. The armed services rely on information, which they call intelligence, to defend the nation, sadly corrupting a beautiful word. This so-called intelligence is not only documents. It could be the deployment of troops, the layout of the land, the location of factories, and so on. All these provide information to the military.

Similarly, organizations acquire and protect the information they think they possess in order to remain competitive and retain control of the businesses. A quotation attributed to Benjamin Disraeli illustrates this very well: “As a general rule, the most successful man in life is the man with the best information.”³⁰ Then in 1996, James A. Mirrlees and William Vickrey were awarded the Nobel Prize for economics for saying much the same thing, the citation reading “for their fundamental contributions to the economic theory of incentives under asymmetric information”.³¹ And, of course, Francis Bacon is famous for saying, “Knowledge is power.”

This brings us to the central issue of running businesses in today’s Information Society: what role could or should money play in such a global, interconnected society? This was one of the first questions that I asked myself in the late 1970s as we entered the Information Age,

as I described on page 11. And as we saw there, Daniel Bell pointed out that we have no economic theory of information.

We can see the reason for this from the example of the information in a railway timetable we used on page 495. Information, in essence, is not a physical object, giving it some rather strange properties in conventional economic terms. For instance, when I buy a loaf of bread, the object passes from the storekeeper to me in exchange for money. However, when a teacher gives pupils some information, nothing is exchanged. Both teachers and pupils have the information. As Tom Stonier has said, “Whereas material transactions can lead to competition, information transactions are much more likely to lead to cooperation—information is a resource which can be truly shared.”³²

But there seems to be very little motivation in the world today to cocreate a Sharing Economy on a global or even local scale. Rather, we attempt to make the intangible content of objects such as books, CDs, DVDs, and software behave like physical objects through intellectual property laws, such as copyright, trademark, and patent laws. Even human beings, like sports, film, and pop stars, are ‘brands’ today, to be marketed like soap powder. How far is this dehumanization of our species going to go before we all go stark raving mad?

To see why it is virtually impossible to cocreate a peaceful society living in harmony with the fundamental laws of the Universe, we need to look specifically at the psychology of money, which is a form of information, whose meaning, and hence value, is determined primarily by people’s sense of identity. The flora and fauna on Earth have been evolving for billions of years without the need for money because they do not feel separate from each other, their natural environment, and the Divine Cosmos. Neither did the human beings who first received the great gift of self-reflective, Divine Intelligence around 25,000 years ago, living in what the myths of many cultures have described as a ‘Golden Age’.

As we see in Subsection ‘Primitive economies’ in Chapter 11, ‘The Evolution of the Mind’ on page 815, money emerged in human societies when the fragmented, split mind led people to believe that they were separate from each other (and the Divine), leading to a sense of mistrust as people sought to gain advantages over others. In the words of Mike Hussey, a late professor at the Open University in England, “Money is institutionalized mistrust.”³³ To enable the exchange of goods in such a divisive environment, early forms of primitive money were simply objects, such as cowries and pigs. But as the Stone Age moved into the Iron Age in the first millennium BCE, people began to manufacture coins of both precious and base metals, their values also being determined by their shapes and marks inscribed on them, as we see in Section ‘The birth of coinage’ on page 849.

Then as Hellenic and Western civilizations moved further and further away from Reality—as did civilizations outside Europe—money became increasingly impalpable, until today most forms of money are a series of 0’s and 1’s in computers. As such, money could really be

treated like the information in our railway timetable, shared with all in a win-win situation. But because people's sense of security and identity in life is based on money as an immortality symbol, we have reified money, turning it from a measuring unit, like kilograms and metres, into an object with value. So today, some 95 to 97% of business transactions by volume involve financial 'products', called 'instruments' by investment banks.

Consequently, the meaning of money has become the primary causal factor in society today, separating people and communities from each other. We even need permission from the banks for the basic necessities of life, such as housing and land on which to grow food. And because the primary purpose of joint-stock companies is to make money rather than produce products that we need for our health, well-being, and very existence, they use techniques of mass persuasion through the unconscious, as Vance Packard pointed out in his classic book *The Hidden Persuaders* in 1957. So today, advertising is a \$300 billion industry in the USA, about 2% of that country's GDP.³⁴ The rest of the world spends another \$200 billion a year, from which we can gather that the Americans are the most gullible people on Earth.

But it is not only business corporations that are attempting to manipulate our minds through techniques of persuasion. Politicians, through their oratorical skills, and religious leaders, often playing on people's fears, behave in very much the same way. As do teachers, parents, and our peers, all of whom are constantly attempting to get us to behave in a manner that they find acceptable. And the meaning of information, in the broadest sense, mostly drives this social dynamics rather than some physical force.

Moving from the ridiculous to the sublime, aestheticism provides another example of the way that structural energy can affect us as human beings. We can be deeply moved by all art forms, such as music, poetry, novels, paintings, and movies, which might not have any functional benefit, and architecture, which normally does. Even mathematics, science, and accountancy have great beauty for those engaged in such pursuits.

One further example is humour, which is another way in which our inner beings can be filled with laughter and happiness through meaningful structures. Arthur Koestler devoted Part I in *The Act of Creation* called 'The Jester' to this subject. Here is an example that John von Neumann, the designer of the stored-program computer, gave him:

Two women meet while shopping at the supermarket in the Bronx. One looks cheerful, the other depressed. The cheerful one inquires:

"What's eating you?"

"Nothing's eating me."

"Death in the family?"

"No, God forbid!"

"Worried about money?"

"No ... nothing like that."

"Trouble with the kids?"

“Well, if you must know, it’s my little Jimmy.”

“What’s wrong with him, then?”

“Nothing is wrong. His teacher said he must see a psychiatrist.”

Pause. “Well, well, what’s wrong with seeing a psychiatrist?”

“Nothing is wrong. The psychiatrist says that he’s got an Oedipus complex.”

Pause. “Well, well, Oedipus or Shmodoedipus, I wouldn’t worry so long as he’s a good boy and loves his mamma.”³⁵

Koestler points out that the humour in this example arises from the clash of opposites, which he calls bisociation, which pervades many creative activities, in harmony with the paradoxical Principle of Unity lying at the heart of the Universe. As he says, in this example:

The cheerful woman’s statement is ruled by the logic of common sense: if Jimmy is a good boy and loves his mamma there can’t be much wrong. But in the context of Freudian psychiatry the relationship to the mother carries quite different associations.³⁶

Of course, we not only respond and react to information that we receive from our external

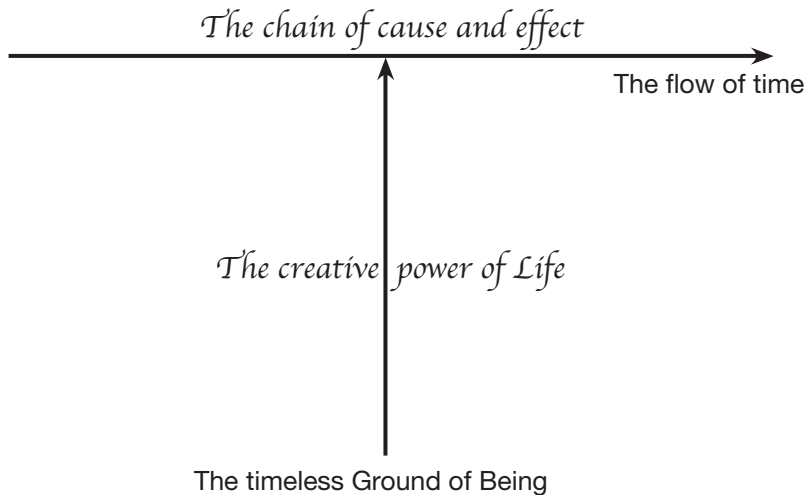


Figure 5.7: *Creativity and the chain of cause and effect*

world; forms and structures also originate within us. Sometimes, patterns mechanistically emerge in the horizontal dimension of time, just as computers can be programmed to generate quite complex patterns from simple seeds, as Richard Dawkins’ program ‘The Blind Watchmaker’ illustrates. However, computers’ ability to write evocative poetry, for instance, according to preset rules is extremely limited, indicating that our creativity arises predominantly in the vertical dimension of time, as illustrated in Figure 5.7.

Recognizing that the Ultimate Cause of our creativity is Life arising directly our Divine Source is absolutely essential if we are ever to live in love, peace, and harmony with each other. For as we saw in Subsection ‘Concept of concept’ in Chapter 1, ‘Starting Afresh at the Very Beginning’ on page 111, structures generally arise first as vague forms of inner visualization

before they become articulated. And these visualizations are themselves causal, as we see in such phrases as ‘the cause of human rights’ and ‘a good cause’.

In other words, causality is both a pull and push phenomenon, where the pull is some principle or ideal that people wish to pursue. But then, when we look at society as a whole, there is often a clash of wills, as one person’s ideal is another’s abhorrence. Such either-or conflicts often arise when considering ethical issues, such as the right of a woman to have an abortion versus the right of the unborn embryo or foetus to grow and develop, or the right of a human being to die peacefully when the pain of living becomes intolerable, called euthanasia, from Greek *eu* ‘good, well’ and *thanatos* ‘death’.

As the creative power of Life is continuously pouring through us all, for millennia, societies have also wrestled with the problem of how to balance all this potential outpouring of energy with the need to maintain society in dynamic equilibrium. Totalitarian regimes have generally preferred stability to individual freedoms, the antidote supposedly being democracy, ‘rule by the people’. But during the past century or two, democracies have only been able to maintain a modicum of order by stultifying people’s natural intelligence from a very early age, teaching them the seven pillars of unwisdom. For if they did not, children would be able to see the absurdity of what they were being taught and the ruling authorities would no longer have power over the people.

With evolution currently passing through the most momentous turning point in its fourteen billion-year history, this tricky psychodynamic situation is as critical today as it has ever been. One paramount problem is the fourth pillar of unwisdom, the widespread belief that human beings are machines and nothing but machines and that therefore technological development can drive economic growth indefinitely. So politicians are doing their utmost to get as many people as possible to work in mechanistic economic systems, thus preventing them from realizing their fullest potential as Divine, Cosmic beings before *Homo sapiens sapiens* ‘wise, wise human’ inevitably becomes extinct.

For climate change and the many natural disasters since the beginning of the millennium remind us that the Earth is inherently unstable, only able to support today’s complex technological society for a few more decades, at most. But because evolution has been more divergent than convergent, as human beings have learnt more and more about the world we live in, the mind has become fragmented, unable to see what is happening to humanity within the overall Cosmic Context that we all share.

The only viable solution to this problem is for all the divergent streams of evolution to converge in Wholeness, the Ultimate Final Cause of the Universe. This can happen when all the ethical and political conflicts that we witness in society today are brought into consciousness as the nondual union of all opposites, enabling us to return Home to the Immortal Ground of Being in the Eternal Now, as Figure 5.8 illustrates, reversing the upwards creative

power of Life in Figure 5.7. But is evolution about to guide us towards its glorious culmination at its Omega point? Or are we going to continue rushing hither and thither, having little understanding of where we are all heading?

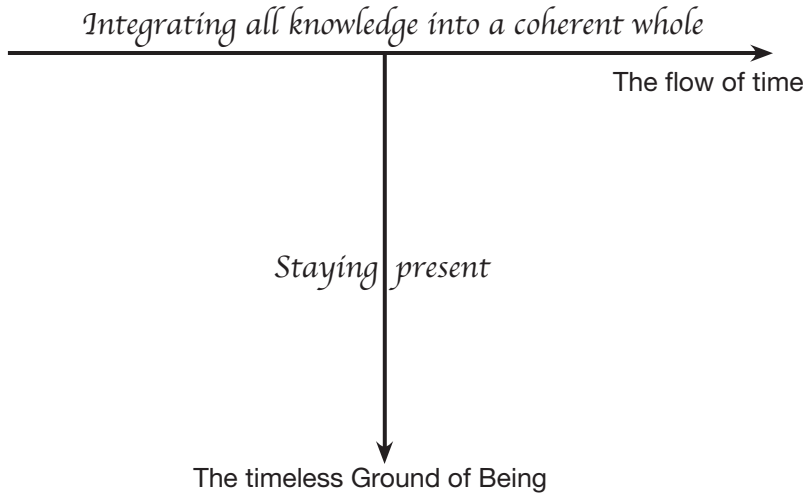


Figure 5.8: *Staying present in the Eternal Now*

Aristotle's four causes

As Aristotle was not a mystic, he rejected Heraclitus' Hidden Harmony—the fundamental design principle of the Universe—apparently not aware of the vertical dimension of time. Nevertheless, he was an astute observer of the world around him, laying down the foundations of a science of causality, which has many similarities with the holistic science being described in this chapter.

Aristotle's thoughts on causality are contained in both his *Metaphysics* and *Physics*, no doubt because the one third of his writings that have survived mostly resemble lectures rather than systemic works of literature. In Book V of *Metaphysics*, Aristotle begins with a number of definitions of Greek *arkhe* 'beginning, origin', saying that a common property of all beginnings is the first thing from which something either exists or comes into being or becomes known. Hence *phusis* 'nature' is a beginning, and so is element, understanding, choice, essence, and final cause.³⁷

In Book II of *Physics*, Aristotle began his study of causality by separating mathematics from natural science. He said that mathematicians abstract properties, such as odd and even and straight and curved, which are conceptually separable from the world of change. Although he owned that mathematics could be applied to the natural sciences of optics, harmonics, and astronomy, for instance, it seems that he was keen to distinguish the abstract purity of geometry from natural science, which he regarded as "a single branch of knowledge

[studying] the purpose or end of something and the way in which the purpose is achieved.”³⁸

Having defined the scope of natural science, Aristotle then identified four different types of cause—known today as material, formal, efficient, and final—saying, “These are more or less all the ways in which we use the word *cause*.” Here is how he defined each of these types of cause:

One way in which the word *cause* is used is for that from which a thing is made and continues to be made—for example, the bronze of a statue, the silver of a bowl, and the genera of which bronze and silver are species.

A second way in which the word is used is for the form or pattern (i.e. the formula for what a thing is, both specifically and generically, and the terms which play a part in the formula). For example, the ratio 2:1, and number in general, cause the octave.

A third way in which the word is used is for the original source of change or rest. For example, a deviser of a plan is a cause, a father causes a child, and in general a producer causes a product and a changer causes a change.

A fourth way in which the word is used is for the end. This is what something is for, as health, for example, may be what walking is for. If asked, “Why is he walking?”, we reply, “To get healthy”, and in saying this we mean to explain the cause of his walking.³⁹

Giving further examples of the sense of that from which things come, Aristotle included “letters (from which syllables come), matter (from which artefacts come), fire and so on (from which material bodies come), parts (from which wholes come), and premises (from which a conclusion comes).”⁴⁰

David Bohm called on Aristotle’s four causes to show that it is delusionary to view reality in terms of separate fragments rather than as an undivided flowing movement. In particular, he emphasized that the word *formal* in ancient Greek meant, in the first instance, “an inner *forming activity* which is the cause of the growth of things, and of the development and differentiation of their various forms”. In contrast, in today’s superficial society, *formal* tends to refer to an insignificant outward form, as in the terms *formal dress* and *a mere formality*. To avoid any confusion here, Bohm suggested that we use the term *formative cause* rather than *formal cause*, emphasizing “that what is involved is not a mere form imposed from without, but rather *an ordered and structured inner movement that is essential to what things are*”.⁴¹

Now as the action of any formative cause must evidently have an end or product, formative cause always implies final cause. For instance, “it is not possible to refer to the inner movement from an acorn giving rise to an oak tree, without simultaneously referring to the oak tree that is going to result from this movement.”⁴² Of course, as this book is endeavouring to show, the ultimate Final Cause is Ineffable, Nondual Wholeness, brought about the formative cause of the Logos arising directly from our Divine Source.

Another word that we can associate with final cause is *design*. For instance, an architect can design a building or a software developer can design an information system. And when evo-

lution has carried us to its glorious culmination at its Omega point, we can see how the Cosmos is designed, enabling us, if we wish, to design the infrastructure of a peaceful society living in harmony with the fundamental laws of the Universe. However, because what is happening to humanity at the present moment is unprecedented in the entire history of evolution, such a Utopian vision could only be realized when all the divergent streams of evolution have converged within a critical mass of people. Although the True Nature of all beings in the Universe is Wholeness, without such an experience, it is very difficult to visualize where humanity is actually heading. There is still a predominant focus on the relativistic world of form rather than on Absolute Formlessness.

From this perspective, we can then see that Aristotle's material and efficient causes are just special cases of the more general formative and final causes, which are inseparable two sides of the same coin. For matter and agents are structures, coming into being through the immanent power of the Logos, fulfilling their end purpose of becoming a star, elephant, or whatever.

Having defined four basic causes, Aristotle then went on to explore the relationship between cause, chance, and spontaneity,⁴³ which we leave until later in the book.

Energy, synergy, and entropy

While Reality is Wholeness, also called Consciousness, God, or Universe, we nevertheless live in the illusionary world of form, structure, and relationships. For practical purposes, it is therefore of interest to understand what has been causing the growth of structure to accelerate exponentially over the years. To do this, we need to use the archæology of language to make a fundamental change to the concept of energy as the physicists define it today, and thereby show how energy relates to synergy and entropy. This is such a confused subject that in 1996 the Scientific and Medical Network (SMN) in the UK devoted one of its Mystics and Scientists conferences trying to unravel the mysteries of energy in a conference called 'The Nature of Energy: Science and the Subtle'.⁴⁴

Let us begin with the etymology of the words. *Energy* derives from *energeia* 'activity, efficacy, effect' from *energes* 'active, busy, working' from *en-* 'at' and *ergon* 'work'. Similarly, *synergy* derives from *sunergos* 'working together' from *sunergein* 'to cooperate' from *sun-* 'together' and *ergon* 'work'. In ancient Greece, a fellow-worker was called *sunerithos*. It is clear from this that *energy* and *synergy* originally referred to human activity and work. Aristotle seems to have had this meaning in mind when he said, "The energy of the mind is the essence of life." More generally, Aristotle, in attempting to find a causal explanation for the phenomena that he observed, made a clear distinction between *energeia* as an actuality and *dunamis* 'ability, power', from which we obtain *dynamics*, as a potentiality. But we do not need to go

further into Aristotle's brave attempts to make sense of the world he lived in, using his four causes of material, formal, efficient, and final.

The Neo-Platonists then gave *energeia* a mystical meaning, as Chris Clarke, professor of applied mathematics in the UK, explained at the SMN conference. As he said, the idea of *energeia* was:

A sort of potentiality for action as a seed of God which could then flow into God. And that became actually the dominant use of the word *energy* in the Middle Ages through the writings of Pseudo-Denys. Energy was part of a triple of *ousia*, *dunamis*, and *energeia*: being, power, energy. The being of God, the power which flowed out from God, the *energeia*, which was the return back to God, carrying the acts of God back to the One. And that was the basic concept of energy for five hundred years in late antiquity and the early Middle Ages.⁴⁵

This conception of energy is reasonably close to providing us with an explanation for the accelerating pace of change that we are experiencing today. However, with the birth of science in the seventeenth century, the concept of energy took a marked turn of direction. "Energy became a numerically conserved quantity," in Chris's words, with these dimensions, encapsulated in Einstein's famous equation $E=mc^2$:

$$\frac{\text{mass} \times \text{distance} \times \text{distance}}{\text{time} \times \text{time}}$$

Similarly, force, power, and action came to have these dimensions, respectively, the first made clear by Newton's equation $F=ma$:

$$\frac{\text{energy}}{\text{distance}} \qquad \frac{\text{energy}}{\text{time}} \qquad \text{energy} \times \text{time}$$

At school, I was told, "Energy is the capacity to do work," which is something of a tautology for work has exactly the same dimensions as energy. Today, the physicists claim that all change in the Universe is caused by four basic forces: electromagnetic, gravitational, and the strong and weak nucleic forces. They claim that even human behaviour can potentially be explained in terms of these four forces, which they are trying to unify in some generalized concepts and equations. It is sometimes difficult to see why evolution should have taken the world of learning further and further from Reality and the Truth in this way. Nevertheless, it has happened and we must make the best of it, accepting and respecting those scientists who wish to hold on to these modern beliefs, taking people further and further away from the innocent wisdom of the ancients.

We can begin to take science out of the evolutionary cul-de-sac it finds itself in today by noting that with the URT we view the Universe in terms of structure, form, relationships, and meaning, more abstract concepts than the space, time, matter, and energy of the physicists. This means that meaningful structure-forming relationships must be causal and thus energetic. This includes the nucleic binding energies that can be explosively released in nuclear fission and fusion and Rupert Sheldrake's hypothesis of formative causation by morphoge-

netic fields, which Rupert denied were energetic.⁴⁶

The word *synergy* best encapsulates the notion of relational energies. It is a word that has come into general use only in the past few decades. It did not appear in the *Concise Oxford Dictionary* of words in common usage until the sixth edition published in 1976 although the OED records its use as far back as 1660 to mean ‘cooperation between people’. In modern scientific use, *synergy* has come to mean the ‘combined or correlated action of a group of bodily organs, mental faculties, drugs, etc.’ first recorded in 1847.

For myself, I first came across the word *synergy* when visiting IBM Canada in 1979, when we exchanged ideas on how to build integrated databases, necessary if managers and professionals were to build effective decision support systems.⁴⁷ The eleventh edition of the *Concise Oxford English Dictionary*, published in 2004, defines *synergy* in this way: “interaction or co-operation of two or more organizations, substances, or other agents to produce a combined effect greater than the sum of their separate effects”. This is perhaps why synergy is a concept generally ignored by mathematicians. If you tear a greenback in half and give each half to someone else, what you give them is worth nothing. But if you join the two halves together again, the whole is worth one dollar. So $0+0=1$!

The third of the words we need to look at in this section is *entropy*, which was coined by Rudolf Clausius in 1865 (actually *entropie* in German):

I propose to name the quantity *S* the entropy of the system, after the Greek word *trope*, the transformation. I have deliberately chosen the word *entropy* to be as similar as possible to the word *energy*: the two quantities to be named by these words are so closely related in physical significance that a certain similarity in their names appears to be appropriate.⁴⁸

Actually, *trope* in Greek had two meanings. As Jeremy H. Marshall of the Oxford English Dictionary Word and Language Service (OWLS) told me in a letter in 1993,⁴⁹ *trope* meant not only ‘a turn or turning’, but could also mean in many contexts ‘change, transformation’. It was in this latter, more unusual, sense that Clausius coined *entropy*.

As Marshall said, the related verb *trepo* ‘I turn’ could be used both for ‘turn around, change direction’ and ‘change one’s mind’ or ‘go sour’ (like wine). “The Greek root therefore has the same duality of meaning as the root of the English word *turn*, which may, for example, mean ‘change direction’ (as in ‘turn into a side-road’) or ‘change form’ (as in ‘turn into a frog’).” However, the Greek compound *entropē* did not have this latter meaning. It literally meant ‘a turning inward’, but only being metaphorically used in classical Greek to mean ‘respect’ or ‘shame’. So *entropy*, as used in modern science, is not based directly on the Greek compound, but on a new formulation.

In this respect, *entropy* is rather unusual in science. The suffixes *-tropy* and *-tropic*, which derive from *trope*, generally mean ‘turning, changing direction’ rather than ‘turning into, transformation’. For instance, *heliotropic* means ‘turning towards the sun’ and Stanislav

Grof's neologism *holotropic* means 'turning towards the whole'.⁵⁰ However, *holotropic* could also mean 'transformation of the whole'. Indeed this word beautifully denotes the transformation that we need to go through as a species if the children born in this millennium are to grow old enough to have children of their own.

But what did Clausius actually mean by *entropy*? Well, he wanted to measure how much of the energy of a machine was available for doing useful work and how much was unavailable, dissipated through friction, for instance. Entropy was a measure of the unavailability of a system's energy to do work, of its disorganization. This has given rise to the second law of thermodynamics, which states, "the entropy of an isolated system which is not in equilibrium will tend to increase over time, approaching a maximum value at equilibrium."⁵¹

This can be simply illustrated with hot and cold taps pouring water into a basin. The water is mixed, becoming tepid. But this lukewarm water cannot be unmixed to become hot and cold water again without an external source of energy. If the second law of thermodynamics applied to the Universe as a whole, viewed as a closed system, without anything outside it, such irreversible processes would lead to the 'heat death of the Universe' as its final state, with no available energy to do work or create anything.⁵² This led Greg Hill and Kerry Thornley to describe the second law of thermodynamics as "perhaps the most pessimistic and amoral formulation in all human thought".⁵³

Unifying growth and loss of structure

We are now at the heart of the dichotomy between science and spirituality. By the Principle of Unity, the opposite of the growth of structure, illustrated by the growth of the information technology industry in this chapter, is the loss of structure, encapsulated by the second law of thermodynamics. During the past 150 years, there have been multitudes of attempts to heal this deep split in our understanding of the world we live in. But because scientists are not generally mystics and mystics are not usually scientists, for the most part we are still living in utter confusion, unable to make sense of what is happening to our species at the present time.

At the core of this problem is Charles Darwin's book *On the Origin of Species by Means of Natural Selection, or The Preservation of Favoured Races in the Struggle for Life*, published on 24th November 1859,⁵⁴ at about the time that Clausius was formulating his ideas on the science of thermodynamics. Chapters 3 and 4 in this epoch-making book are called 'Struggle for Existence' and 'Natural Selection', which led the economist Herbert Spencer to coin the phrase 'survival of the fittest' in 1864.⁵⁵ This is not unreasonable, for the more adapted individuals and species are to the circumstances in their lives, the more likely they are to survive. That is why *Homo sapiens* is the most threatened species on this planet today. We are simply not adapting to the unprecedented rate of evolutionary change we are currently experiencing.

While we do not want to blame Darwin for this precarious situation, for he was a product of his times, the first two chapters of his book did not help. They were called ‘Variation under Domestication’ and ‘Variation under Nature’. So how has all the beautiful diversity we see in the world around us arisen? Well, Darwin began his investigation by studying the way that gardeners propagate new varieties by grafting, etc. In this way, “variability may be largely attributed to the ovules or pollen, or to both, having been affected by the parent prior to conception”.⁵⁶ So natural selection not only determines which varieties can best survive, but it also influences the generation of the varieties themselves. Life or God the Creator is not involved in any way at all, a denial that that has affected all mainstream theories of evolution ever since.

This is very strange for no doubt scientists use the words *enthusiasm*, from Greek *enthousiasmos*, from *enthous*, ‘possessed by a god’, which is based on *theos* ‘god’, and *inspire*, from Latin *inspirare*, ‘breathe into’, from *spiritus*, ‘breath or spirit’. So why do they still think that the atheistic laws of physics and biology can explain their enthusiasm, why they are inspired? Traditionally scientists have not accepted the notion of human energy arising directly from our Divine Source, or if they have accepted it, they say that such energies lie outside the domain of science. As Carl Jung once said, analytical psychology does not fit into the prevailing scientific paradigm, but it works, so let us continue with it.

Thankfully, the Unified Relationships Theory shows that there are no closed systems in the Universe. All systems are abstractions from Consciousness, which, through Life or the Logos arising from our Divine Source, creates all the organized forms and structures we see within and around us. But the fact that Consciousness is all there is is not well known in scientific circles because we are taught in our culture that we are separate from God, Nature, and each other. So maybe it will help to end this isolationist philosophy to look a little more closely at how evolution has moved us increasingly closer to Wholeness during the last two-thirds of the twentieth century, developing what is today called ‘holistic science’.

One of the pioneers in this movement was Ludwig von Bertalanffy, who in the 1920s became deeply concerned that the then prevalent mechanistic approach “appeared to neglect or actively deny just what is essential in the phenomenon of life. He advocated an organismic conception in biology, which emphasizes consideration of the organism as a whole or system, and sees the main objective of biological sciences in the discovery of the principles of organization at its various levels.”⁵⁷ In the next decade, he went on to develop what is today called General System Theory (GST), general because it can be applied to systems and organizations in many disciplines, including economics, psychology, and sociology, as well as biology. If we are to fully understand these disciplines, GST thus takes a holistic, organismic approach rather than the reductionist, mechanistic approach that prevails in science even today.

In his standard textbook on the subject in 1969, von Bertalanffy included Norbert Wiener's *Cybernetics: Or Control and Communication in the Animal and the Machine*, published in 1948, within the embrace of GST.⁵⁸ The word *cybernetics* derives from Greek *kubernetes*, 'steersman, governor', from *kubernan* 'to steer', which is also the root of the English verb *govern* and hence *government*. In choosing this name, Wiener acknowledged that the first significant paper on self-regulating, feedback mechanisms was a paper on governors published by Clerk Maxwell as early as 1868.⁵⁹

But on the same page, Wiener introduced a conceptual confusion that pervades in the literature even today. He said, "Just as the amount of information in a system is a measure of its degree of organization, so the entropy of a system is a measure of its degree of disorganization; and the one is simply the negative of the other." Thus the terms *negative entropy* and *negentropy* emerged, which are appropriately deprecated in IBM's *Dictionary of Computing*.

This relationship between information and entropy arose through Claude Shannon's 'A Mathematical Theory of Communication' published in 1948.⁶⁰ But there were some differences between Shannon and Wiener's respective formulæ for entropy. While "Both regard information as 'that which removes uncertainty', and both measure it by the amount of uncertainty it removes,"⁶¹ as W. Ross Ashby has pointed out, Shannon's formula for entropy was positive, while Wiener's was negative.⁶²

Shannon, himself, was uncertain what to call the 'measure of uncertainty' or attenuation in phone-line signals that he had developed:

My greatest concern was what to call it. I thought of calling it 'information', but the word was overly used, so I decided to call it 'uncertainty'. When I discussed it with John von Neumann, he had a better idea. Von Neumann told me, "You should call it entropy, for two reasons. In the first place your uncertainty function has been used in statistical mechanics under that name, so it already has a name. In the second place, and more important, nobody knows what entropy really is, so in a debate you will always have the advantage."⁶³

One of the reasons why there has been so much confusion around the concept of entropy is that it is a mathematical concept, not intuitively obvious. Actually, what is significant here is the *change* in entropy, rather than entropy itself. Whatever entropy might be, we can say that when a system loses structure or organization, there is an increase in entropy and loss of available energy. Conversely, the growth of form and structure leads to a decrease in entropy, and hence an increase in energy. However, Wiener was adamant that this was not the case, when he said: "Information is information, not matter or energy. No materialism which does not admit this can survive at the present day."⁶⁴

Ilya Prigogine, who studied open systems, in contrast to closed ones tending towards equilibrium, took another major step in the development of holistic science in the 1970s. On open

system is one that exchanges matter and energy with its environment. As Prigogine and his co-writer Isabelle Stengers said,

In far-from-equilibrium conditions we may have transformation from disorder, from thermal chaos, into order. New dynamic states of matter may originate, states that reflect the interaction of a give system with its surroundings. We have called these new structures *dissipative structures* to emphasize the constructive role of dissipative processes in their formation.⁶⁵

I must admit, I don't really understand why these open systems are called dissipative structures, for such an understanding is not directly relevant to the theme of this book. What we are interested in here is what surrounds the Totality of Existence viewed as a system of systems all interacting with each other. As this book explains, the universal environment or context is Consciousness. But Consciousness does not appear in the theory of dissipative structures and so this cannot help us to heal our fragmented minds in Wholeness.

In 1973, Humbert R. Maturana and Francisco J. Varela took another major step in the development of General System Theory with their book *Autopoiesis: The Organization of the Living*.⁶⁶ *Autopoiesis* means 'self-producing, self-creating', deriving from the Greek *auto* 'self' and *poiesis* 'creating, producing' from *poien* 'to make, create', which is also the root of *poem* 'something created'. Maturana and Varela were thus attempting "to define living systems *not* as they are objects of observation and description, not even as interacting systems, but as self-contained unities whose only reference is to themselves."⁶⁷ Nevertheless, they still regarded living systems as machines not organisms, as this definition indicates:

An autopoietic machine is a machine organized (defined as a unity) as a network of processes of production (transformation and destruction) of components that produce the components which: (i) through their interactions and transformations continuously regenerate and realize the network of processes (relations) that produced them; and (ii) constitute it (the machine) as a concrete unity in space in which they (the components) exist by specifying the topological domain of its realization as such a network.⁶⁸

There is no mention of the role of the Logos in this organizing process. For as Richard Tarnas tells us, Heraclitus, the mystical philosopher of change, used the word *Logos* to mean an "immanent conception of divine intelligence" signifying "the rational [organizing] principle governing the cosmos".⁶⁹ So as Fritjof Capra emphasizes, Maturana and Varela were intent to keep Life or vitalism out of their theory: "Our approach will be mechanistic: no forces or principles will be adduced which are not to be found in the physical universe."⁷⁰ Nevertheless, the very next sentence established them as bona fide systems thinkers not as Cartesian mechanists: "Yet, our problem is the living organization and therefore will not be in properties of components, but in processes and relations between processes realized through components."⁷¹

Other systems theories that emerged in the 1970s and 80s were chaos theory⁷² and complexity theory.⁷³ But these remained at the superficial level of things, drawing heavily on non-

linear mathematics and computerized technology. In my experience, they are very little help in our search for Wholeness, in the complete unification of Western reason and Eastern mysticism.

Of course, during the twentieth century, there were a number of vigorous attempts to bring Life back to science, particularly to evolutionary theory. In 1907, Henri Bergson published a book called *L'Evolution créatrice*, translated into English four years later as *Creative Evolution*. Bergson suggested that by looking at humanity's natural creative impulse there must be an *élan vital*, or vital impetus in the English translation, at work in the Universe. Indeed, he went as far to say that there is an *original impetus* of life, which "is the fundamental cause of variations"⁷⁴ in Nature.

In *The Human Phenomenon*, written at the end of the 1930s, Pierre Teilhard de Chardin extended this theme when he wrote in a chapter called 'The Inside of Things':

We shall assume that all energy is essentially psychic. But we shall add that in each individual element this fundamental energy is divided into two distinct components: a *tangential energy* making the element interdependent with all elements of the same order in the universe as itself (that is, of the same complexity and 'centricity'); and a *radial energy* attracting the element in the direction of an ever more complex and centered state, toward what is ahead.⁷⁵

These notions of tangential and radial energy correspond directly to the horizontal and vertical dimensions of time illustrated in Figure 4.11 on page 272 in Chapter 4, 'Transcending the Categories'. As with all opposites, we need to include both if we are to find Wholeness.

Then in 1940, Reginald Kapp, a professor of electrical engineering at London University, was brave enough to publish a highly challenging book called *Science versus Materialism*. As an engineer, he said, "We know that it is not in the nature of Matter unaided to fall into the form of machines."⁷⁶ Other enlightening quotations from this splendid book are, "In this book, we are pointing to overwhelming evidence for the existence of non-material influences;"⁷⁷ "The field of study of biologists is not Life but living organisms. They investigate the structure and behaviour of these, not the causes of such structure and behaviour;"⁷⁸ and "Any evidence which proves the organic world to be subject to laws from which the inorganic world is free is evidence for vitalism."⁷⁹

I did not come across this book until 2005, when I was introduced to it by his children John and Elinor Kapp,⁸⁰ at a Mystics and Scientists conference called 'Healing the Split: An Alchemy of Transformation', organized by the Scientific and Medical Network in the UK, an organization seeking to go beyond the materialism of modern science.⁸¹

Unifying Darwinism and Creationism

Tragically, such organizations are still a minority in society. Ever since Francis Crick and James Watson discovered the structure of the deoxyribonucleic acid (DNA) molecule in

1953,⁸² drawing on earlier work by Maurice Wilkins and Rosalind Franklin, there has been a widespread belief that DNA contains the secret of life, that this nucleic acid “contains the genetic instructions used in the development and functioning of all known living organisms”.⁸³ Crick and Watson, well aware of the significance of their discovery, humbly began their nine-hundred-word article, published in *Nature* on 25th April 1953,⁸⁴ with these words: “We wish to suggest a structure for the salt of deoxyribose nucleic acid (DNA). This structure has novel features which are of considerable biological interest.”⁸⁵

More than this. The DNA molecule is a double helix of a linear sequence of bases, bonded across the two strands of the helix in pairs: adenine-thymine and guanine-cytosine.⁸⁶ Thus the DNA language has just four letters—A, T, G, and C—with which to generate all the complexity of living organisms. As Watson said, “Anything that simple, that elegant just had to be right.”⁸⁷ In 1961, Sydney Brenner and Francis Crick “did the definitive experiment that demonstrated that the code was triplet-based”,⁸⁸ that all the words in the DNA language are just three letters long. This means that there are 64 (4^3) possible words with which to generate the twenty standard amino acids that are used by cells in protein biosynthesis.

Actually, the DNA molecule does not generate these amino acids directly. It does so via a messenger RNA molecule, which also contains four bases, but with thymine replaced by uracil. All that remained therefore was to discover which triplets generated which amino acids. The key breakthrough was made in 1961 by Marshall Nirenberg and Heinrich Matthaei, who showed, using a technique developed by Marianne Grunberg-Manago six years earlier, that UUU generates polyphenylalanine.⁸⁹ Gorbind Khorana then picked up the challenge of decoding the other 63 triplets or codons, which led to the unravelling of the complete genetic code by 1966, listed in Table 5.1.⁹⁰

So the genetic code is a type of information, informing cells about which amino acids to make. And as the Unified Relationships Theory shows, all forms and structures that are causal in this way are types of energy. But here we are only looking at tangential energies. To develop a full understanding of the secret of life, by the Principle of Unity, we also need to include the role of radial energies arising directly from our Divine Source as Life. I know this from my own life experience. There is no evidence whatsoever that the DNA that I inherited from my parents and grandparents played any role in the emergence of the URT. On the other hand, there is a wealth of evidence to indicate that the traumatic events that took place in my environment in my early life provided the key motive power, as I describe in detail elsewhere.

Undoubtedly, Life—God the Creator—also played a key creative role in the discovery of the structure of the DNA molecule. But Life is almost totally ignored by biologists today. As Watson believes, life originated when RNA-based life forms emerged some four billion years ago. He does not acknowledge the role of Life in the big bang ten or eleven billion years earlier.⁹¹

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

Table 5.1: *The genetic code*

The belief that the DNA molecule is the basic building block of life, an atomistic notion that has a parallel in physicists' search for a fundamental particle as the basic building block of all matter in the Universe, has led James Watson to pick up on the eugenics movement, popular at the end of the nineteenth century and beginning of the twentieth.⁹² The word *eugenics* was coined by Francis Galton, a half-cousin to Charles Darwin, in 1883,⁹³ from the Greek *eu* 'good, well' and the Proto-Indo-European base **gen-* 'to produce' (the Greeks had a word *eugenes* 'well-born'). So eugenics originally meant "an opportunity for humans to control their own evolutionary destiny".⁹⁴

Now if the DNA molecule controls the development and functioning of all known living organisms, then if we are ever to live in love and peace with each other, free of the conflict and suffering that has afflicted human affairs for millennia, then we must engage in genetic engineering to ensure our health and well-being. James Watson's belief in a renewed eugenics⁹⁵ got him into very hot water on a visit to the UK in October 2007, when he suggested that black people are less intelligent than white.⁹⁶

Another scientist determined to take Life out of biology, literally ‘the study of life’, from Greek *bios* ‘life’, is Richard Dawkins, who calls himself a neo-Darwinist. As a promoter of evolution only by natural selection, he has said that it is not only individuals and species that fight for survival. As “A gene is defined as any portion of chromosomal material that potentially lasts for enough generations to serve as a unit of natural selection,” genes themselves must be selfish.⁹⁷

One of the key features of genes is that they replicate themselves.⁹⁸ It seems that it is this property that leads biologists to believe that these forms of life are life itself. Dawkins extends this notion of self-replication into the noosphere with his concept of *meme*, a contraction of *mimeme*, from the Greek *mimeisthai* ‘to imitate’ from *mimos* ‘imitator’, the root of *mime* and *mimic*. A meme is “a unit of cultural transmission, or a unit of *imitation*”.⁹⁹ “Examples of memes are tunes, ideas, catch-phrases, clothes, fashions, ways of making pots or of building arches.”¹⁰⁰ So memes are examples of what we called passive and active cognitive structures—we know that and we know how—described in Section ‘Analogous human cognitive characteristics’ in Chapter 8, ‘Limits of Technology’ on page 639.

A similar replicating idea is described in Rupert Sheldrake’s *The Presence of the Past*. He suggests that through the action of morphic fields, once a particular structure is formed in evolution, it tends to repeat itself through habit. *Morphic* derives from the Greek *morphe* ‘form’. Yet in *A New Science of Life*, Sheldrake denies that formative causation is energetic: “although morphogenetic fields can only bring about their effects in conjunction with energetic processes, they are not in themselves energetic.”¹⁰¹ He seems to have made this statement because he did not wish to break the laws of physics as they are widely understood.¹⁰²

Dawkins holds a similar reverence for the conventional laws of physics: “The physicist’s problem is the problem of ultimate origins and ultimate natural laws. The biologist’s problem is the problem of complexity.” And “The kind of explanation we come up with [for how complex things come into existence] must not contradict the laws of physics.”¹⁰³ It is this sort of belief that leads evolution to be blind, that prevents us from managing our business affairs with full consciousness of the evolutionary energies that cause us to behave in the way we do. If the human race is to survive for very much longer, it is imperative that we break the habitual systems of thought that we have inherited from our less than fully conscious ancestors. In this way, we could end the war between Darwinism and Creationism, and peace could break out.

Information and entropy

To this end, let us see if we can bring some conceptual clarity to the concept of information in Claude Shannon’s ‘A Mathematical Theory of Communication’. For he used the word *information* in quite a different way from that used by information systems designers, who regard information as data with meaning, as we see on page 159 in Chapter 1, ‘Starting Afresh

at the Very Beginning'. As Claude Shannon admitted in an article he wrote for a now obsolete edition of the *Encyclopædia Britannica*, communications theory is not concerned with the meaning of the information in messages, but solely with signs, codes, and the quantitative measurement of these entities in a mechanistic, stochastic sense.¹⁰⁴

So it is misleading to use the word *information* in this connection, as Theodore Roszak has pointed out.¹⁰⁵ For the essence of information is to inform and to provide meaning. So the concept of information is essentially semantic, not mathematical. But when we view information mathematically, it becomes "disjointed matters of fact that [come] in discrete little bundles".¹⁰⁶ Nevertheless, such a mechanistic approach can shed some light on a more holistic perspective, showing how entropy relates to meaningful information and hence energy, for in the URT meaning is energy.

Although Shannon did not use the word in his papers, central to an understanding of information entropy in his theory is the concept of *variety*, which W. Ross Ashby seeks to quantify.¹⁰⁷ It is, of course, this variety that so pleases us in the diversity of all the forms of life we see around us, which Darwin addressed in the first two chapters of his epoch-making book.

If we begin with a set of distinguishable elements, Ross Ashby defines variety as "either (i) the number of distinct elements, or (ii) the logarithm to base 2 of the number". The chief advantage of using logarithms here is that operations can be additive rather than multiplicative. So the variety of a coin is 1 bit and of a pack of cards it is $\log_2 52 = 5.7$ bits. Tom Schneider, in his 'Information Theory Primer', calls variety uncertainty.¹⁰⁸ "In reading an mRNA, if the ribosome encounters any one of 4 equally likely bases, then the uncertainty is 2 bits."¹⁰⁹

However, in general the various elements are not all equally likely. If the probability that the i th element in a set of n elements occurs is p_i , then

$$\sum_{i=1}^n p_i = 1$$

We now come to perhaps the central dilemma of the theory, surrounding the concept of $-\log_2(p_i)$ (the minus sign is added to make the quantity positive). What should we call this? Well, D. S. Jones calls it 'self-information'¹¹⁰ and Myron Tribus called it 'surprisal' in the first textbook that based the laws of thermodynamics on information theory.¹¹¹ For in a device that is transmitting symbols, the smaller p_i is, the more surprised the receiver will be to see the i th symbol. Conversely, when $p_i = 1$, then there is no surprise, for $\log_2(p_i) = 0$. In human terms, we are told something we already know and no information is conveyed.

Now if we take a weighted sum of these surprisal terms, we obtain the following formula for entropy with the symbol H rather than Clausius' S because this is the symbol that Ludwig

Boltzmann used in his similar formula in statistical thermodynamics.¹¹²

$$H = - \sum_{i=1}^n p_i \log(p_i)$$

Ross Ashby calls this measure the ‘degree of variety’,¹¹³ which we could perhaps call ‘diversity’. It is at a maximum when all elements are equally likely.¹¹⁴ For instance, if four elements are equally possible, the entropy is 2 bits. On the other hand, if the probabilities are ½, ¼, 1/8, and 1/8, then the entropy of this set is 1.75 bits (0.5*1 + 0.25*2 + 0.125*3 + 0.125*3).

In systems terms, the growth of structure leads to greater diversity and hence a decrease in entropy and increase in available energy. However, this quantitative measure omits the immense energy contained in the relationships in the structure. There is also a tentative link between surprisal and meaning. The more unlikely a message transmitted by a system, the more symbols are required to convey it and the more information that these symbols might convey. But these symbols must be meaningful to the receiver, otherwise they contain very little information and hence energy. This applies particularly to the symbols in this book, which actually have immense power if interpreted in the context of Wholeness rather than filtered through a set of fragmented, inherited belief systems.

And it is here that the whole theory of communication breaks down. For such a theory supposes the existence of a separate transmitter and receiver. But in Wholeness, these are not separate. Wholeness is so improbable in the context of the prevailing culture that either an infinite number of symbols is required or none at all. It is through silence that Wholeness can best be conveyed.

One more point we can draw from cybernetics. As Ross Ashby points out, elements in a system or set of possibilities often don’t have the same properties as the population as a whole. For instance, a gram of hot iodide gas at any one moment might be 37% iodized. But this does not apply to individual molecules, which are either wholly iodized or not at all.¹¹⁵ In human terms, we cannot fully know ourselves if we take an egocentric, ethnocentric, anthropocentric, geocentric, or even a kosmocentric perspective. We can only fully heal our fragmented minds when we view our lives within the overall context of Wholeness.

