

Epistemology and the Ethers

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Discussion of key principles and their applications in research and practice

The more science explores subtle variables such as weather, latitude, soil types, planting dates, soil ecologies—to say nothing of human factors—the more obvious it is that agricultural research has no hope of limiting or controlling most of its variables, and we need to update our methods. Single variable experiments intended to reveal differences and contrasts like yield comparisons, return on investment, or percent of rejects tell us nothing about important collateral issues like environmental gains or losses, aquifer recharge or depletion, operator health risks, market cycles, labour availability or changing demographics. We also need to investigate long term, subtle relationships which may be cyclical and may only occur under certain conditions—fundamental things like coherence, entrainment and aggregation. For example, long term studies reveal there is more rainfall during the moon's second quarter than during its fourth. There must be some reason why and with enough data we might discover something momentous.

Chaos Theory (1955) shows us the reality of syntropy, and fluid dynamics (O. Reynolds, 1887) shows us a microscopic change at a point can effect large scale changes in the medium. Quantum theory (1920s and 30s to date) suggests the need to investigate coincidence, attraction, synchronicity and similarity as even the subtlest variations can be revealing of macroscopic patterns when we look at huge sets of data points, such as fractals .

Western thought crystalized with the adoption of Emanuel Kant's epistemology. Kant asserted that how we know something is real is by our five senses—and there are no other means. In other words we can know the physical form of any plant, animal or human, but since we cannot hold its life in our hands or measure its will to live, this must mean its life is not real. As self-aware humans we value certain things highly and deem others worthless. Are we to imagine these values are not real? And are there not physical results from holding these values? Excluding life and values from reality may seem strange to 21st century folks on the street, but at the time of Kant things beyond the five senses were categorized as "imponderable" and ignored.

Things were simplified even further when Rudolf Clausius published his paper "On the Moving Force of Heat and the Laws of Heat Which May be Deduced Therefrom" in 1850. In this paper he stated what was called the Second Law of Thermodynamics. His later introduction of entropy (1865), stated that the order of the universe was inevitably running down into disorder, and he concluded entropy would be complete when the universe succumbed to utter chaos and uniform distribution of heat. How simple could it be?

Coupled with the ideas of Pierre-Simon Laplace that the universe follows a precise calculable path, Kant's epistemology and the Kant/Laplace cosmology were far and away the predominant theories taught in Western schools in the late nineteenth and most of the twentieth century. This all seemed to make the pursuit of scientific truth so clear and simple that physicists and mathematicians of that time believed they were on the verge of understanding the totality of natural science, or at least the 'hard' sciences like physics and chemistry.

Physics went from Newton and Maxwell to the twentieth century figures of Einstein , Bohr , Heisenberg and Schrödinger . However, things clearly were more complex than they had seemed, so that all efforts to form a theory of everything failed.

Newton's law of universal gravitation states that every particle attracts every other particle in the universe with a force directly proportional to the product of their masses and inversely proportional to the square of the distance between their centres. Newton's introduction of gravity became the first force in physics. Newton did a great job of describing how an apple falls from its tree, but gravity doesn't explain how the apple got up in the tree in the first place. Something was missing.

Newton also investigated colour. He set up a shield with a slit and placed a light source behind it with a prism on the other side. Lo, this produced a spectrum of colour as with a rainbow. Newton theorized the prism divided light into a gradient of wavelengths and colour was a property of light itself. Here was light with no opposite, just like gravity.

Theory of Perception

German army physician and mathematical physicist, Herman Helmholtz, was a genius at taking things apart and analysing them in the finest detail. He tackled the physics and thermodynamics of how heat-driven biological systems worked. Despite some early success he bogged down in the finer details. Helmholtz firmly believed entropy ruled and all thermodynamic systems ran down, but with living organisms—even with weather systems—entropy only was evident on the dying side of nature. Life eluded analytical detection, was unseen, had no measurable substance, was imponderable. It did not fit Kant's epistemology as something real. Surely, Helmholtz thought, living systems could not defy entropy. All things measurable and substantial were subject to entropy—or so he believed.

In his studies of eyesight and hearing, what eluded him most was the mind/body problem. As with life, consciousness also had no place in Kant's epistemology. What was our means for viewing the external world as an internal experience? And from whence comes our motivation? Though he assumed the brain was the transducer, Helmholtz failed to find how the mind/body interface worked. As a Kantian he measured things exceedingly well, but somehow this was not enough.

Colour Theory

One of Helmholtz's more frustrating studies was his comparison of Newton's colour theory with the colour theory of Johann Wolfgang von Goethe. Goethe disagreed with Newton and refuted the idea that colour was determined solely by light itself. Goethe pointed out that a prism only produces colour at a boundary between light and darkness. Hold it before a candle or other light source like a white wall and no spectrum emerges. A boundary between light and darkness could be a black line on a white surface, or it could be a slit in a shield with a light behind it. Helmholtz quickly confirmed a boundary between light and dark was required, but there were aspects of Goethe's colour theory that troubled him deeply. Helmholtz excluded any emotion or 'fanciful' imagination from his research, while Goethe was convinced science seeks goodness and beauty as well as truth, since it takes all three to satisfy our hearts' desires.

Goethe not only held that darkness participates in producing colour, he suggested colour is shaped by perception as well as the juxtaposition of light and darkness, and his colour theory included the psychological impact of different colours on mood and emotion. Blue was cool and calming while red was hot and stimulating. This frustrated Helmholtz to the point he bitterly complained that Goethe had a terrible habit of mixing art and poetry with his scientific work.

Observer and Phenomena

In his lifetime Goethe's scientific writings often were rejected by fellow scientists, though a bit

later quantum physicists like Heisenberg and Schrödinger found Goethe to be a rich source of inspiration. Goethe's belief that the observer and the phenomenon were inseparably linked was especially at odds with his contemporaries. To Goethe it was obvious perception is limited to and determined by our concepts. What is beyond our conception eludes our perception. Furthermore, the observer chooses what to look at and how. People commonly attract those experiences they look for most, whether out of desire or aversion. Other experiences pass them by unnoticed. Here we see Goethe's line of thinking flying in the face of the popular Cartesian belief that reality is purely objective and the observer has no influence over the phenomena. As it turns out, quantum theory vindicated Goethe as it found the observer, and his instruments of detection, is a determining factor in the field of investigation. Observers seeking waves find their non-local patterns, and seeking particles they find their locations. Both are indeterminate until the observer looks, an unsettling notion for believers that what we know as reality is independent of influence by the observer. To some, as yet unknown, extent we determine the realities we experience.

This highlights some of the differences between Goethe's epistemology and Kant's. According to Kant our senses are our sole link to reality. But according to Goethe our senses correspond with our hopes and fears. While hopes and fears give rise to sensations and sensations to hopes and fears. Both are real.

In his alchemical investigations Goethe not only studied the elements and ethers of Greek philosophy, but also elemental beings—gnomes, sylphs, undines and salamanders—which he used imagination to 'see'. These beings inhabit the ethers corresponding to the fire, air, water and earth elements which show the effects of their otherwise unexplained activities. This is a major departure from Kant and modern physics.

Polarity

An essential part of Goethe's epistemology was polarity. There could be no distinction, and thus no perception, without difference and no differences without opposites or polarities. Though Goethe defined force as "that which compels", he further ascribed this driving principle of inanimate nature to polarity. On the other hand, he found living organisms were driven by enhancement, both as growth and as evolution.

Goethe, ever seeking polarity, was astonished by Newton's colour theory, which asserted light by itself produced colours. Goethe thought Newton failed to observe how passing light through a slit in a shield caused the interaction of light and darkness to produce colour. After all, a prism produces no colour when held before a white wall. Only where light and darkness meet does a prism produce colour. Furthermore, holding a prism to a white line on a black background results in a subtly different spectrum than holding a prism to a black line on a white background. Basically Newton attributed colour solely to light, while Goethe found the interaction between the polarities of light and darkness was required.

This also called Newton's theory of gravity into question since it too attributed the relative motions of earth and moon to gravity with no opposite. Goethe asked "Where's the polarity?" Engineers have to deal with both centripetal (inward) and centrifugal (outward) forces, but physicists say it's all gravity. The evidence of levity surrounds us in the growth of plants and in the fact we defy gravity just getting out of bed in the morning. But even in the non-living realm the insistent expansion of the universe supports Goethe's belief that gravity is only one side of two opposite poles of nuclear force. In 1999, observations with the Hubble Telescope showed the universe is expanding fastest at its outermost edges—the opposite pole from centre of mass,

density and gravity. As we know, the whole cosmos appears to be expanding, and even though the moon is falling to earth, the earth is spiralling away so fast ahead of the moon that the moon keeps falling behind. Currently the moon is a few steps further away from us today than when Neal Armstrong made his giant step in 1969. If levity opposes gravity, what does this mean for the life and organization of the universe?

Maxwell's Ether

In conventional physics, where gravity is the first force, electromagnetism is the second. By combining two polarities of force, electricity and magnetism, James Clerk Maxwell and Michael Faraday created transfer of electromagnetic force along the inner surface of a wire, while J. J. Thomson discovered electrical discharge through ionized gasses. Thomson's subsequent discovery of what he termed the 'electron' launched a new era of atomic theory. This suggested to Maxwell there must be an extremely fine stationary field which supports the propagation of light and electromagnetic waves the way the air propagates sound. It was an age of supposition. He called this field the ether or the ether field. Ultimately this field was not found with the interferometer experiments of Michelson and Morley which measured the speed of light in a wide range of directions. They found no interaction with any etheric field in any direction, though we know the earth is traveling around the sun at great speed. Some said their measurements were not fine enough, so they built a huge interferometer resting on a bed of mercury to dampen extraneous vibrations and they still detected no 'etheric wind'. This was taken as proof there was no ether, which is currently the basic belief. Michelson and Morley's experiments disproved the existence of Maxwell's fixed etheric field, but this did not disprove the existence of ether as an organizational (life) force. Dirac believed mathematics required an organizational force, or mathematical ether as an inherent property that maintained the stability of all physical masses.

Subsequently, with the development of what is called the weak and the strong nuclear forces, Lord Rutherford and his co-worker, James Chadwick rounded out the picture of what is currently known in physics as the four forces.

At this point it should be acknowledged that scientific observations have generally been quite excellent, but the theories used to explain them must be questioned.

The Goethean Difference

A very different picture, perhaps more elegant, emerges with the Goethean epistemology. Goethe saw a force of electricity between positive and negative charge, and a force of magnetism between north and south or left and right spin. He also acknowledged a third, nuclear force whose polarity is gravity/levity, dead/alive, dark/light and collapsed/spacious.

Goethe would have argued electromagnetism combines two forces, electricity and magnetism, in order to transfer charge through a wire's inner surface. One may wonder at possible combinations of electro-nuclear or magneto-nuclear force, and anyway we may have electro-magneto-nuclear force. In the meanwhile let us explore Goethe's views of how things work while setting popular belief aside.

Electricity arises between positive and negative charge and magnetism between left and right spin. But plants respond to east/west, north/south and up/down. Gravity with its centre mass viewpoint only explains the downward side of plant behaviour, while plants grow both up and down. Newton's gravity requires an opposite expansive viewpoint, levity, to truly describe nuclear force.

Nature's forces all work seamlessly together. We might as well take into account the Biblical/folklore world of angels and demons as well as elemental beings active in warmth, light, chemistry and life. By applying Steiner's worldview to agriculture, we have to include a belief that the astral (awareness) and egoic (self-awareness) dimensions are, in the language of mathematicians, 'rolled up inside' what we perceive externally. While Kant's epistemology denies the existence of anything we cannot perceive with our senses, we have to set these limitations aside to explore Goethe's epistemology, which acknowledges astrality (sense and desire) and egoity (self-determinism) as realms or dimensions our five senses support but do not penetrate. Whatever the case may be, let us explore the idea that there are ways of knowing that normally were invalidated, suppressed or we were never trained to consciously use. We might call this intuition, clairvoyance, imagination or whatever. Some use dowsing. Regardless, we need an extra sense or senses to 'see' the ethers and elemental beings which organize the various aspects of the earth's biosphere.

The first step is acknowledging syntropy or life as the opposite polarity to entropy or death. At the universal level entropy seems to rule as things age and wear out, but living organisms, within their limitations, are syntropic during their lifetimes. Nobel laureate, Erwin Schrödinger pointed out in his biophysics lectures (1948) that living organisms have the remarkable ability to concentrate a stream of order on themselves and thereby reverse the second law of thermodynamics within their boundaries for as long as they live.

Goethe's epistemology, as carried forward by Rudolf Steiner, culminated in Steiner's medical and agricultural work. In his early tertiary studies at the Technische Hochschule Wien Steiner majored in mathematics, chemistry and biology. This was the mid-19th century when mathematician Bernard Riemann's work was a hot topic in projective geometry, the all-geometry that includes the Euclidean and counter Euclidean forms among others. Riemann's parabolic geometry became the basis for relativity theory, which poses the question of whether, at some point, the universe will collapse back in on itself. On the other hand, what if the universe is both parabolic and hyperbolic, where mass gravitates centrally but light kisses off of surfaces, never to return to its origin?

Steiner spent ten years studying and editing Goethe's scientific writings for the Goethe Archives and the Kürschner edition of Goethe's works. Having studied mathematics, Steiner realized we can't develop a mathematics of living organisms until we learn to use both geometric systems—the content of the organism within its context. The context reveals an organism's significance while the content reveals its internal organization. Steiner knew that organization—the basis of life—arises at the boundary between inner space and outer space. This realization had many practical applications.

Life Arises

Launched by the work of climate mathematician, Edward Lorenz, Chaos Theory dates back to 1955 in physics, and is not a theory about whether chaos exists or not. There's plenty of chaos, but chaos theory is an effort to explain why order arises out of chaos at boundaries. Basically, as long as the boundary is complete, the context informs the content and organization grows and evolves. Steiner asserted this, while Lorenz discovered and published it.

At this point it may help to understand that Steiner spent a couple decades where he made a living as a tutor who would tutor any subject. Thus there's no way of knowing what Steiner studied, though his studies were quite broad.

What Is Life?

It was Goethe's argument that a butterfly specimen in a display case was a corpse that once was enlivened by a butterfly spirit, which departed when the physical bit was chloroformed and displayed in a case. Whither went the butterfly process, the butterfly's life? The specimen on display is no longer enlivened by the butterfly's essence, invisible though it might be.

What is less clear is how alive the earth and the universe are. Planets organize according to Bode's Law around the sun; minerals organize into ores within the earth. Organization in the seas gives birth to life, and the organization of moisture into clouds builds weather systems. Lest we forget, there's the organization of celestial objects both near and far into stellar systems, galaxies and galactic clusters. Everywhere we look in the universe organization occurs.

In 1910 in Berlin, Steiner delivered a lecture entitled "The Spirit in the Realm of Plants" where he said:

"Thus we cannot picture the earth only as a physical structure, for the physical structure is for us something like our own physical body, which can be seen with the outer eyes and touched with the hands, and which is observed by outer science. This is the earth body that present-day astronomy or geology studies. Then we have to direct our attention to what in the human being we have come to know as the etheric body or life body. The earth also has such an etheric body, and it also has an astral body. This is what awakens every spring as the thoughts and feelings of the earth, which recede when winter approaches so that the earth rests in its own ego, closed off within itself, retaining only what it needs in order, through memory, to carry over the preceding into the following, retaining in the plant's seed forces what it has conquered for itself. Just as the human being, when he falls asleep, does not lose his thoughts and sensations but finds them again the next morning, so the earth, awakening again from sleep in the spring, finds the seed forces of the plants in order to permit what has been conquered in an earlier time to emerge again from the living memory of the seed forces."

Imagine the entire universe as organized between order and chaos, gravity and levity, darkness and light, and death and life. In Goethe's day few considered what the outer bounds of the universe might be, but today astronomers talk about the very edge of the universe.

The Ethers

But first let us acknowledge the dynamic organizational processes which Steiner called the ethers. These cannot be understood by looking at a single moment where the processes are at rest. In the classical view, the elements--fire, air, water and earth-- are tangible. They are present. We perceive them as enduring without change—fire being somewhat the exception. The activities associated with these elements remain unseen. For example, warmth is the process that brings into being the fire element. Fire, as combustion, would fail to exist without the presence of warmth to begin with. Steiner's views grew out of Goethe's epistemology, so let's see what that means.

Goethe believed nature is alive even if we don't understand how. Steiner reasoned that at the widest expanse of the universe life processes must be so attenuated as well as ponderous they elude detection, and yet they are no less significant. For example, we estimate the background warmth of the universe to be 2.7 degrees Kelvin even in the most tenuous interstellar voids. This is the universal warmth ether, the source of time and the result of oscillation .

As previously stated, Steiner's concept of the ethers is tied to the four elements in ancient Greek

and Vedic philosophy—fire, air, water and earth. They also considered something inherent to the elements called the ether. The four elements are visible, tangible and subject to entropy, while the ether or ethers associated with these elements are invisible, dynamic and syntropic. “Dynamic” indicates an energetic process that begins and ends over an interval of time, and “syntropic” means they are organizational, or flowing from lower concentration to higher concentration. The ethers organize and activate the elements, though, as will be explained, it takes a different ether for each element.

Warmth Ether

The initial ether stage, the warmth ether, is one with the fire element. It is purely temporal and non-spatial oscillation, having no mass or density, only duration, beginning with warmth, existing as fire, passing as heat. With the warmth ether/fire element, oscillations are intensive as change and sequence. At this stage there is no space. The event oscillates, not the space. Extensive oscillations require space to occur, but the first ether, the warmth/fire/heat ether, generates only duration, which is required for space to exist.

You could say warmth, fire and heat are different sides of the same coin, although the warmth ether, like a coin, has three aspects—past, present and future or tails, heads and the coin’s rim which is the boundary between past and future where organization occurs. As such the warmth ether/fire element has three forms. The past is physical heat. The present is the element fire itself here and now. Fire burns. And the warmth ether brings the future fire into being. Warmth ether is a constant driving force, the wellspring of time. In any given moment warmth/fire/heat oscillates, becoming, being and passing.

In modern physics we often put space before time. However, space cannot exist unless what is changes or oscillates with time. Time is zero dimensional in the sense that it doesn’t create space. Time always passes, but it doesn’t go anywhere. Though we never stand still, we live in the present, recall the past and aspire to the future each moment. Time does not need space to exist. In alchemical lore sulphur is often treated as the vehicle or bearer of fire, the catalyst like a sulphur match, to initiate oxidation. Organic chemistry uses sulphuric acid along with heat as its chief catalyst for carbon chemistry. It should be noted that sulphuric acid (H_2SO_4) is one unit of sulphur, four of oxygen and two of hydrogen. Steiner identified oxygen as the active agency in all etheric processes.

Light Ether

Following the warmth ether, the light ether is more dense as it creates order within the air element. Light ether flows outward from boundaries, creating space within the fullness of time. With light we have the first appearance of its opposite—physical density and mass or the collapse or negation of space. Though we may not think of air as dense, the atmosphere above us is substantial enough to provide upwards of fourteen pounds pressure at sea level. Transparent to light and four fifths of the atmosphere, nitrogen is the perfect medium for transmission of the light ether.

Light is syntropic, which means it creates order, and order is the basis of life. It extends outward from its source in as straight a line as anything we know of, though it also diffuses and scatters in the air element, creating what we think of as three-dimensional space.

Nitrogen carries the astrality, which is our inner awareness of sensation and desire, our thinking, feeling and willing interaction with the surrounding universe. Arising from the cosmic background,

astrality, is drawn into the solar disc through the ecliptic. The neighbourhood of stars interacts with the outer and inner planetary spheres and evokes a kaleidoscopic organic display in the earth's air element, especially in spring when light rises into prominence.

The opposite of light is density, which is lifeless entropic darkness and the collapse of space. Where light reveals the outer surfaces of things, displaying them in space, density is what the surface conceals, the absence of space where darkness prevails.

Nitrogen—carrier of the astrality, chief component of air and the most sensitive element in the periodic table—is well-informed about everything, though it is extremely shy. Nitrogen is fused in its own embrace by sunlight and then only reacts with itself. However, in the interaction of darkness with star light nitrogen engages in the growth and reproduction of life chemistry. Plants take up nitrogen from the darkness of the soil by day, while they wait for sunlight to fade to grow. Growth mainly occurs at night, while photosynthesis and ripening of fruits rich in flavour and aroma occurs by day.

Light ether's substantiation, or loss of dynamic organization, is otherwise known as the 'fallen' light ether or electricity—the potential for discharge resulting from light collapsing into density. Where the light ether creates space, electricity seeks to annihilate space by discharge. Where light reveals the outer surface of a wire, electricity travels on the inner surface of the wire. This is the earthing of a dielectric charge—the discharge of space to density—rather than the flow of electrons envisioned by J. J. Thomson or Maxwell and Faraday, though it corresponds to the interchangeability of photons and electrons in quantum electrodynamics.

Tone Ether

As a characteristic of the ethers, each one creates the conditions for the next ether to arise. After light, the next and even more dense etheric stage, the tone ether, organizes the water element which shows us the characteristics of hydrogen in the way water behaves. To warmth/time and light/space, tone adds vorticity or movement to water, which spins either left or right as well as in and out, creating nodes, waves, intervals, separation and union, number and periodicity, precipitation and buoyance. The tone ether is the mathematical ether, though this is math in terms of graphing points like fractals rather than mere arithmetic. The tone ether generates waves, which we graph as flat, but water rotates either left or right when going down a drain or coming out of a hose, so a wave is actually a vortex traveling in space. With rotation and number comes odd and even, factors and primes, waves and nodes, rhythm, intervals, music, harmony, dissonance, chemistry, precipitation and buoyance.

Tone ether is an arousing force appearing as waves and harmony. Tone ether is found everywhere in our sense-perceptible world where levity, order and numbers occur. It brings separation and division as well as arcs and intervals. It is the agency that lifts, divides, differentiates and creates relationships and movement in all living things.

Organizational processes of the tone ether start with hydrogen. Hydrogen, along with its sibling helium, is 99.9% of the mass of the universe. They are what all the periodic table elements are made of, and hydrogen is everywhere and in all things.

Hydrogen is where spirit becomes matter, and there is no matter without spirit or spirit without matter. Hydrogen is where every activity arises and expires. It is by far the most abundant element in the universe. Nature involves balance and pairs, and hydrogen teams up in pairs of atoms to

balance left and right spins. This moderates magnetic moment, but each individual hydrogen atom has a strong magnetic moment (either left or right spin) by itself, and magnetic resonance imaging (MRI) scans need only read a body's hydrogen atoms.

As the first of all substances, hydrogen is a spinning point of charge, bonding with myriad points of discharge in its surroundings, some more binding than others. Even the strong bonds migrate in a process called hydrogen bonding. Hydrogen has movement through time and space but next to zero content for its rather large sphere of influence. Since order arises from chaos at boundaries and hydrogen provides near infinite boundary with infinitesimal content, hydrogen is the most organizational of all elements, the source of life and where the spirit first appears physically. The element organized by tone ether is water. What collapses or rigidifies the tone ether—aka the 'fallen' tone ether—is magnetism, which has inflexible clockwise and anti-clockwise forces leading in and out from an origin point. Magnetism forces immobility. This negation of the tone ether's fluid vorticity is static and inflexible, though universal. We would never take a compass apart to see how it works because the earth's magnetic field, rigid though it may be, encompasses the whole earth. This is also true for the sun's magnetic field and the galaxy's, though there are constant re-adjustments occurring all the time as this dichotomy of motion and fixity are both ever present. Inertia and mass are also characteristics of the fallen tone ether, though magnetism is where we see the cessation of motion most clearly. Both vorticity and rigidity exist as a polarity, just as left and right spin or light/darkness and expansion/ collapse

Magnetism combined with electricity can produce a dielectric charge that seeks discharge from the inner surface of a metallic array to the earth. This is the collapse of the space that light creates. Unlike light, which would be visible, electromagnetic current travels on the inside surface of the metal wire, from which it discharges at the speed of light. Rather than the flow of electrons envisioned by Maxwell and Faraday, alternating current involves the collapse of space as charge finds a path to earth, even though with alternating current the charge is going back and forth in both directions negating any "flow" of electrons.

Life Ether

The last and the most dynamically organized stage is the life ether. It contains, permeates and integrates self-organizing forms. The life ether provides unity and identity to organisms whose physical structure is made up of what Vedic and Greek philosophies called the earth element. Chinese philosophy calls this wood since, like wood, what gives form to what is organized as carbon. Carbon, with its fourfold capacity for bonding is the medium the life ether unites and enlivens. We are all carbon based life forms and life ether forms the basis of the earth's biosphere. Since each ether creates the conditions for the next ether to arise, the life ether depends on the creation of time by warmth, space by light and movement by tone to create coherence by containment. Living organisms are forms with an inside and an outside, a content and a context. Every living organism must have a cell wall, an outer membrane, a skin, a hide, a shell, rind, bark or outer integument of some sort. This containment forms the living organism with all four ethers, warmth, light, tone and life working together in unity. Life ether is the vitalizing force of identity, boundedness and healing that permeates every living organism. When this is lost the organism dies. Whenever we impair this containment, take a living organism apart and destroy its coherence we terminate its life.

Life ether is the binding force that imparts form, coherence, unity and individuality to living organisms. Author and researcher Rupert Sheldrake calls this morphic resonance, and the morphic field. This is the self-resonant coherence that sustains the form of the organism and

keeps it whole. Life ether generates a skin, an outer membrane, an integument or a boundary where content meets context and the influences of the surrounding context isolate and unify the content within the boundary of the form.

For example the boundary of the heliosphere is the heliopause, and we recognize the sun being's integrity and identity by calling it the solar system. On a more mundane scale, life ether shapes organisms according to their environments—clouds above the earth, plants between sun and earth, animals parallel to the horizon and humans aspiring to the heavens. Life ether is the actuating, vitalizing and individualizing force that permeates organic wholeness and heals wounds. It suffuses each organism in its entirety, making it an indivisible living body in which every part within is an integral part of the whole. Such a whole is greater than the sum of its parts.

What collapses the life ether, or the 'fallen' life ether, is radioactivity. Radioactivity shatters atomic nuclei, breaks up and annihilates wholeness, integrity and identity. It destroys the form, volume and coherence of the life ether through fragmentation, splitting and breaking down into a shower of pieces, dust and chaos.

Sub Nature

Electricity, magnetism and radioactivity are the collapse, substantiation, immobilization or densification of the light, tone and life ethers. They are not themselves the mainstays of what we value as nature, but rather they belong to sub-nature which is either non-dimensional, disorganized or dead. Basically the four dynamic, syntropic ethers create time, space, motion and coherence, which are associated with the elements of fire, air, water and earth. The warmth ether finds nature as an oscillation between past, present and future. All else follows. The light, tone and life ethers are opposed by the disorganizational forces of electricity, magnetism and radioactivity which destroy the integrity of living bodies, demolish their coherence, paralyse their motion and create an absence of space. Like yin and yang, we do not see these fallen ethers without the ether they reflect, and vice versa.

Summary

For the purposes of agriculture we can label the expansive, levitational context as the cosmic polarity and the contractive, gravitational content as the earthly polarity. Inevitably there is plenty of interaction between the light-filled, dynamic cosmos and the dark fixity of earthly density, particularly at edges, interior surfaces or boundaries. We have dark nights and bright days, cold winters and warm summers. We have the vital upward surge of spring and early summer, followed by the recycling of summer growth as it digests back into the earth over autumn and winter. The Goethean world view begins with the whole and tries to understand how individual phenomena relate to this gestalt. Ongoing observation is key, along with not jumping to conclusions. Rather than looking at something, forming a hypothesis, making experiments and drawing conclusions, a Goethean scientist keeps re-evaluating the phenomena over and over. As an overview develops, emerging patterns resolve into an all-inclusive picture, as with a forest that cannot be seen by examining individual trees. Specialized scientific training tends to wear blinders, whereas the Goethean scientist by definition must retain an extremely open mind. The physical building blocks of nature alone do not explain life. Life does not of itself explain consciousness, nor does consciousness explain the values and self-awareness that derive from our ego. The Goethean scientist sees all these as true, functional and existent. They are part of everyone's everyday experience.

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