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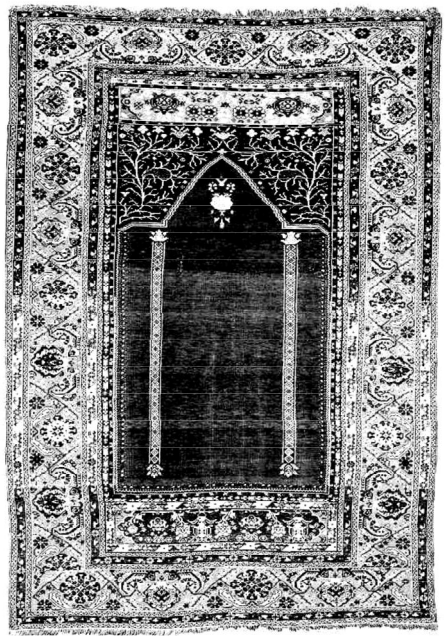
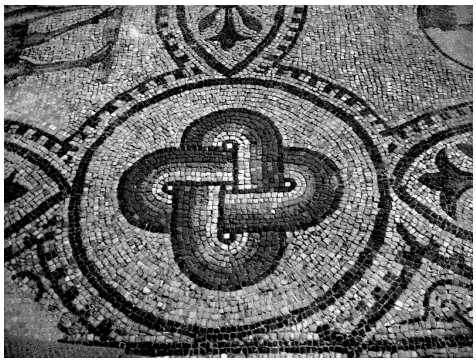
Pathways

ALEXANDER THE GREAT, THE GORDIAN KNOT AND THE FINEST PRAYER RUGS



In 333 BC while pursuing the remaining army of Persian Emperor Darius III, Alexander the Great of Macedon stopped long enough in the ancient city of Gordium in what is now western Turkey to cut the Gordian Knot of King Gordias of Phrygia that an oracle had once declared would only be untied by the man who would rule both the East and the West. 2000 years later the region around the ancient city, now called Ghiordes, became famous as the home of the most beautiful prayer rugs in the world.

Ghiordes or Gordes, Gurdiz, Gierdiz, or Yordi (the list of possible spellings goes on) lies fifty miles northeast of the coastal city of Smyrna. Was there really a Gordian knot? Did Alexander the Great actually cut it with his sword? We will never know for certain. But we do know for sure that Alexander the Great became king of East and West and that the area around the ancient city did produce the wonderful Ghiordes (geeordez) prayer rugs in the 18th Century of the Modern Era.



"Surrender the ego for a glimpse of the immortal, eternal path….." ***Anonymous***

"The Zen student is taught that with prostration one throws everything away." ***Robert Aitken***

The act of unself-conscious prostration before a Buddha, are "horizontalizings of the mast of ego". They cleanse the heart-mind, rendering it flexible and expansive, and open the way to an understanding and appreciation of the exalted mind and manifold virtues of the Buddha and patriarchs.

Philip Kapleau

ARIADNES'S THREAD

We are living in a time in which all the normal pathways and channels for expressing meaning seem silted over. What our heart is urging seems to be off the world agenda, wrapped up in economic woes. So many areas of debate, including sustainability and governance, have become arenas for platitudes and corporate self-justification. The world retells itself continuously in the image of whatever it is we want to believe.

At times we are shocked to outrage in the election promises or the company spins or the casino practises of banks. But the truth is that beyond any one example, the system has become so fragmented, the arena of public values and institutions are no longer able to serve a whole universal ethic. The danger in this disintegration of values is that everything deteriorates into mere rhetoric, falls to the level of cheap argument, without being backed by real commitment.

This issue has come together in recognising a second movement of our time, the discovery of our own elements that lead to meaning. This is illustrated in Sean Ferris' article, where the hidden metallic elements become a vehicle for the transmutation of the meaning to "uncover one's purpose and to find fulfilment." The meaning, no longer to be found in the arena of public debate, is come across through underground symbols, as pathway to illumination.

This point is further illustrated in Stephen Buhner's description of his own personal journey. Leaving behind conventional biology he takes us through the story of how he became self-reliant on his own sense of what is meaningful and real. The medium of his journey to meaning is through plants.

Anna Breytenbach represents the paths of many individuals who still stand in honest relation to the universality of the living world. These are the baboons, panthers and elephants with whom she telepathically interacts and who reflect back to her a concern for humanity.

Evelyn Underhill foresees in an article written a hundred years ago, the fall through abstraction of our current society. How do we find our way back from the perspectives of rationality to religion, pain and beauty as signs of the eternal? The article is prescient of the abyss science was about to fall into, in the work of quantum theory, the implications of which are considered in detail in this issue.

Our journeys to meaning do not yet know the universal web into which they are weaving. Where the Kogi still retain a mythological relation of the individual to the universal good of the world, for us our own innovative journeys have to make new chord with the universal. While science has given us many insights of our relation to the world, in the abstract, the challenge is to find the pattern in our living. These authentic journeys are characterised by their unassuming humility, the acceptance that the pathways of meaning occur at an individual level, out of public spotlight. The language of our journeys is the empathy to see in each other's silent determination, a resonant articulation of a shared endeavour.

By gathering together all these pathways, in their separate realms and understandings, we glimpse a universality of engagement, discovered not in thought but through life.

This issue is about all with the courage to pursue their own personal pathway to meaning.

Philip Franses

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PATHWAYS

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CONTENTS

"TO THINK IS TO LISTEN": THE EXPANDED UPSTREAM VIEW OF THE KOGI

MARIANA GOMEZ

"If we want to behold nature in a living way, we must follow her example and make ourselves as mobile and flexible as nature herself" (Goethe, 2002 pg.56 in Holdrege, 2013)

"Nature left everything organized; we understand nature is like a body,
it is a system. We respect the law of nature.
The younger brother writes
a lot, and thinks like he writes; for us
everything is written in nature"
(Words of a Mamo. Dumingueka, 2012)

In times when humanity is in search for sensible and harmonic ways of perceiving and engaging our life on the planet, the traditional philosophies have become a point of reference and inspiration. Ethnic groups have come to represent an "ecological" way of living, under a concept we have made applicable to a wide range of actions that sometimes don't even guarantee the essence of sustainability itself. The "ecological Indian" has become an idealized example of the way we should run our lives in order to be sustainable. But the truth is that it is far deeper and more complex than that. This doesn't mean that traditional cultures don't have an ecological way of living, but that their approach to the way they participate in the living systems overruns our concept of sustainability. It is not just an ecological factor that attributes to them this harmonic essence. It is a profound way of engaging the universe that brings together ecological, subsistence, philosophical, spiritual, religious and social factors that we have brought apart.

I have been working with indigenous groups for the past seven years and been able to engage in their philosophies, understanding them with respect to my anthropological background. However, even though this approach has been a great tool, it wasn't until I started exploring Goethean Science, Henri Bortoft´s ideas on phenomenology and the upstream approach to appearance, that I was able to conceptualize and understand the depth and richness of their way of existing. When working with the Kogi in the Sierra Nevada de Santa Marta as part of the National Parks Management team, and in the meetings with their political and spiritual authorities, I had the feeling that I understood what they were talking about somewhere in me, but wasn't completely sure of the real meaning of all that flood of information I was being exposed to. The use of each word in their language is a window to a vast happening that grew greater and deeper each time, and with the concepts defined by Bortoft and Goethean Science I had the sense that I was finally able to grasp that vastness and bring it closer to my experience. It actually helped me notice that I was in fact being part of the happening, as described by phenomenology, when participating in their meetings.

In this paper then, I approach the vastness of the view of the Kogi through the lens provided by Henri Bortoft's, dynamics of being, in Taking Appearance Seriously (2012) and Goethean Science, as an opportunity to dwell in a much richer way of existing in life, with perhaps a significance for the western cultures.

This upstream expanded way of existing through perceiving, sensing and communicating holds a deep and wise knowledge about nature (Bortoft 2012), that for our naked narrow eye seems simply as a "sustainable" way of living. And it really is. It results in a sustainable way of living, but has much more to it than just that. It is a multi-dimensional knowledge that holds secrets about the energetic network of connections between our planet and the universe, and the way these movements and relations determine and correlate the existence of all living beings. The Kogi are an ethnic group that lives in the jungles of a mountain range on the Caribbean

Columbian Coast called the Sierra Nevada de Santa Marta (SNSM). They are an example of people who perceive and interact intensively with the local environment, especially their watersheds. This provides a perfect setting to get a glimpse of this profound wisdom. Western writers like Bortoft (2012) and Holdrege (2013) provide a lens through which in a clear, almost identical way we can approach it in our own terms.

As it may be possible through a part of the whole to have sense of the Whole (Bortoft 2012), each river born in the snow peaks of the Sierra Nevada de Santa Marta (SNSM) is a window to perceiving the whole mountain range, and even the whole Earth. Each pulse, each drop, each element is as much the part and the whole, in the words of the Kogi: "The Sierra Nevada de Santa Marta is the heart of the world".

The Upstream method of the Kogi

The double awareness in the specific qualities of a particular organism and of the environment expressed by that organism described in the upstream vision of Bortoft (2012), is applied by the Kogi and enables them to see the whole in the parts when they approach a specific watershed in their territory. The SNSM is a tropical mountain range, which goes up to around 5,000 meters over sea level, it contains all the possible tropical climates and ecosystems, and is rich in biodiversity and natural resources, so it requires an integral management.

The Kogi, aware of their mission to protect the heart of the world and maintain the equilibrium of the universe, do not engage with "object thinking" of the western culture, as described by Holdrege (2013) in Thinking Like a Plant, where one takes for granted that nature consists of physical "things" that interact on the basis of impersonal physical laws. Therefore, the "younger brother", as the Kogi have called us, has the perspective of our intelligence as an instrument that enables us to grasp, control and manipulate nature. Nature then becomes an abstraction, something external in which we don't really participate. They, on the other hand, practice what Holdrege (2013) has called "living thinking", a participatory way of knowing that transcends the dichotomies of man-nature, subject-object or mind-matter, a transformative and living way of relating with the world.

By communicating with the spirits of each of the beings in their surroundings, the Kogi participate in a dialogue with matter and meaning at the same time, in which they strive to learn what the phenomenon has to tell them (Holdrege, 2013), just as done in Goethean Science when described by Holdrege and Bortoft (2012). Their participation, a fundamental quality of human embeddedness in the World, is expressed by pagamentos or blessings done in specific energetic points around their territory with sea shells taken from the shores to the highland lakes, and small stones from the highlands to the lowlands. This open-ended dynamic dialogue (Holdrege 2013) with the world in thoughts and actions reveals the living qualities of the world they inhabit and is enhanced by the constant meditation done by chewing a mixture of toasted coca leaves with shell powder calcium, which they carry in a gourd that represents their mindfulness.

The Goethean Science process, which requires a plant sensitive (or watershed in this case) way of formulating its relationship with the environment, to get immersed in the phenomena, and fully participate to allow patterns of order to emerge from the chaos, and the meaning of the differences to reveal themselves (Holdrege 2013, pg.105); is expanded by the Kogi to a telepathic state of communication and participation. Aluna is the term used to refer to the state of mind, body and soul that opens when communicating with beings or elements that are not only non-human, but not necessarily physically in the same place and time. When "in Aluna" the Kogi

are able to envision the interdependence and correlation of relationships between all the existing beings, by perceiving the network in which Bortoft (2012) has explained the meaning of, the whole is revealed and materialized in the identity of each of the parts as self-differencing elements of a dynamic unity.

The personification of natural beings with human qualities through spiritual mothers and fathers, Jaba and Jate, opens a dialogue with the natural world, which attributes intelligence and conscience to "things" that for the western younger brother appear as inanimate and external. A living interaction in conversation with the environment is held by the Kogi as vivid parts of the whole, as well as between every other existing being in the material world and the spiritual realm. Each organism is then a teacher of "living thinking" (Holdrege 2013 pg.118) or "pensar bonito: beautiful thinking", a term used by them to refer to the power of thoughts, meaning that whatever is thought by us is materialized somewhere in some form and will affect the equilibrium of the system. With this self-awareness they acknowledge the activity of human knowing as part of the ecology of the earth (Holdrege 2013, pg. 122), and recognize the depth of our participation in nature. This whispers the "impact" and imbalance our thoughts and actions can cause as well.

The Kogi believe that we humans are able to choose how we shape this engagement. It is the reason why they believe that we have caused "sickness" by creating interference with the energetic network of the universe and breaking the equilibrium, but they also recognize the plasticity of the human mind, and are kin to deliver us a message that will stimulate our growth as "knowers", who hold the potential to sense the whispers of nature; an upstream approach in H. Bortoft´s terms. The more we know, the more the limitless nature of the world becomes apparent and finds expression through us. They insist that we still have to learn to listen, to be able to let the others speak through us, like they do when they speak to the father and mother spirits of each place, element or being, Jaba and Jate, and empower the active participant potential within us. To think is to listen…

Sensing Watersheds

The capacity of the "parts" of nature to respond flexibly to the different environments and conditions is an expression of the organism's openness to it, which gives it the ability to modify itself and develop in relation to those conditions. This definition is used by Bortoft (2012) to refer to the self-differencing quality of a being, like the river that flows through the landscape taking its shape. The river forms itself by informing itself with the environment that supports it (Holdrege 2013, pg.115). Watersheds, flexible enough to actively adapt to the environment in their path from the snow peaks to the ocean, are like whisperers to the Kogi, and reveal the world it has passed through to them.

For the Kogi, "the river is like a person, upstream it is like a child, in the middle it is an adult, when it reaches the ocean it is an elder, and then it comes back up when it dies, to rest in the snow peaks and be born again" (Mamo Rogelio, 2012). The world carries an imprint of the water that has run through every item of the living network (Bortoft 2012), and the water reciprocally carries the world it has run through, making it possible to have a sense of the whole going into the parts. This dynamic movement makes the watershed a piece of a hologram (Bortoft 2012) that reveals the whole as something endless. This expanded science practiced by the Kogi offers a shift of focus within experience, away from what is experienced into the experiencing of it, the happening of the interaction (Bortoft 2012), of

the communication, of the connection, of the existing.
The experiencing of the phenomenon described by Bortoft (2012) as going upstream towards the happening is embedded by the Kogi when approaching a watershed, not only because they are experiencing the experience itself, but because they not only approach the water by its fluidity downstream, or literally downhill, but the water as in a circular motion as well. As described above, the river follows the development process of a human being that dies and is reborn, referring to the evaporation process described by mainstream science and personifying the cycle in the experience of dialogue with all the participants. This way, they are concerned not only about what happens in the upper part of the mountain and the consequences it will have in the estuaries and coastal areas, but worry about the way these last are "managed" because they identify a direct correlation with the state of the highland lakes, which determine the continuity of the water cycle.

As described by Bortoft (2012), it is the togetherness, which determines the belonging, where things already belong with one another and this belongingness determines their togetherness. As participants of existence, they understand the importance to listen and not to impose a framework (Bortoft 2012), for how they say, nature is already organized, it follows sacred patterns that must not be disturbed. These patterns are "laws" that derive from the great Ley Sé or Sé Law. This law contains the principles and fundamental norms of the Original Law that holds the essence, the meaning of existence. "Sé is the passage from the darkness to light, it is the boundary between the spiritual and matter" (OGT 2006). "It establishes the SNSM as an indissoluble unit between the matter of itself and the spirit that animates it, and it manifests itself in the way that all the communities of beings that inhabit it reproduce it in the social structure, culture, way of using her, and in the way we celebrate the cycles of life" they say (OGT 2006).
This law maps a network of interconnections between energetic vortices, which allow a dynamic distinction by the coming-into-being of each participant to occur, a distinguishing in a dual movement of thinking which goes in opposite directions at once: in one direction it differences, whereas in the other direction it relates (Bortoft 2012, pg. 22). These energetic vortex points are called ezwamas, which determine the reason for being of the SNSM and connects its purpose to the open universe. Their connection to these points by walking while meditating their territory, and the pagamento offerings, takes them to endow what McGilchrist (in Bortoft 2012 pg.25) described as "the world calling forth something in me that in turn calls forth something in the world", in a reciprocal dance between them and the natural world, between meaning and existence. "There is no world without thought", because it is precisely our thoughts which bring forward the happening of the meaning, of the whole. And this is only possible if we go upstream from appearance to appearance (Bortoft 2012).

For the case of the Santa Clara River, Mamalwa is the "owner" of it all. Everything that exists was contained within itself, until Jate Muldkwakukwi, the sun, organized all the species and beings throughout the watershed. Mamalwa is who organizes all the species and their interactions, and "holds" diversity. The integral design of the territory is based on the ezwamas, which have a spiritual being responsible for their health, either a Jaba (mother) or a Jate (father). Each Jate at the same time has a Jaba or mother, to which it is required to ask for permission to enter, walk, use, and inhabit. In the case of the sun, Jate Muldkwakulwi, Mamalwa´s spiritual mother Jaba Zawezhu opens access to other Spiritual Mothers, like the Jaba of crops, birds, clouds, cotton and coca plants. When the "job" of speaking to these spiritual beings in each of the sacred sites or ezwamas is done, they are activating one of the principal powers of ritual: the offerings or pagamentos (OGT 2006). By these, it is possible to identify what actions have to be taken forward for the management of the territory, when to crop and where, and other decisions that can't be taken by human beings on their own, but with the participation of all the other beings that inhabit the

meaning, the Great Mystery of existence, in the form of matter. The Kogi use the answers received by these voices to take social, political and economic decisions, and make agreements about ecological calendars with all the Kogi community as well as with the larger community of beings that inhabit the SNSM. These relationships and stories of interaction between the spiritual fathers and mothers determine the character that the watershed occupies within the SNSM. It is a place for the conservation of the different seeds that make the mountain flourish, what determines the diversity of forests. This way, the Kogi are also able to "categorize" the different types of forests, the self-differencing unfolding of the forest, as it is put by Bortoft (2012 p.) when referring to the organs of a plant. The relationships and interconnections with others and with the river, gives this watershed a nourishing function of wellbeing for the people. These Goethean Science engagements with the natural world connect the Kogi with the movement of the planet in order to activate the cycle of the ancestral organization of the territory. This is associated to a healing process related to the protection of biodiversity ecosystems, and people, and their interrelation, an integral view that includes human beings as part of the living system.

An Integral Approach

The vision the Kogi inhabit accepts there is a knowledge in the voice of nature that goes beyond them, which is extemporal in the sense that it is independent of the historical moment of the group. The meaning of the voice of Aluna is the time itself; it is a meaning that redefines itself infinitely every time that a phenomenon is expressed (phenomenology in Bortoft, 2012), inhabiting the power of time, transformation, self-differentiation and 're-significance' through its expression. The dialogue that Kogi sustain with this voice inhabits the idea that "nature has psychic qualities, so as well as being material, there is something mind-like in nature which is its active principle" (Bortoft 2012, pg.45). This opens the door to rediscover living nature, something the Kogi do every time they approach a natural spirit to consult their actions and confirm their intuitions through their sensing body in order to understand the profound meaning of our relationship with the natural environment and to be guided and in consent with this active principle. This way nature comes to presence through the experience of the senses (Bortoft 2012) in an expanded Goethean Science.

The Kogi´s successful method of engaging with nature is therefore able to avoid adding anything which is not there in the phenomenon, and at the same time not leaving anything out (Bortoft 2012), by going into the phenomenon itself and bringing it to themselves in the action. This participation guarantees the precision of the intuition of the wholeness in the decisions taken by these people, and therefore gives their way of living a sustainable quality. A river is a movement, a dynamic whole that the Kogi inhabit by experiencing its metamorphic qualities. This dynamic whole is a movement of differencing which produces multiplicity in unity, and at the same time holds diversity within unity (Bortoft 2012), and the Kogi are able to understand this from their intuitive intelligence by embracing difference in the midst of sameness the same way Bortoft (2012) has described an upstream engagement with existence. In the watershed they see diversity in dynamic unity, and this is a gateway to the meaning of the Whole.

This upstream movement of intuiting, knowing, experiencing and communicating with the river results in a deep ecological understanding of a natural phenomenon that is so "natural" that it seems as if our culture has forgotten it. The water cycle, which has its origin at the top of the snow peak and runs down the slope, filling the landscape with life and feeding other water resources in an interconnected network, gives itself to the ocean to die and be reborn by evaporation as rain at the top of the mountain again. This self-differencing without fragmenting the unity allows them to sense "the earth like a body. We have to protect the blood, which is the water first. The spine is the snow peaks and the mangroves, all these are sacred sites. We don't understand places like hills, rivers or rocks, as Sacred Sites, are connected to the rest of the territory, like the organs in a body".

The SNSM is the origin, the starting point and the centre of the world, which is clustered in concentric circles around her. The SNSM is thought and reality, and the principal task of her existence is to take care and guard the system, for her to continue existing this way. For this, we shall "pay" and "work" traditionally because all that we obtain from nature creates an "unbalance", therefore our thoughts and actions should search for the maintenance of the equilibrium and harmony between human beings and nature" (OGT 2006). This way, participating in the existence of the SNSM and the world as a whole, allows the Kogi to see the diversity of the phenomenon unfolding as the living unity of its coming-into-being (Bortoft 2012), and therefore to be the happening of the phenomenon itself. They embody a doorway through which the past can come to life for them in the present (Bortoft 2012), the timeless understanding of the traditional knowledge, which is the voice of nature, the meaning of the Whole.

The lens of H. Bortoft´s description of phenomenology, upstream participation, and the sensing of Goethean Science, open possible windows towards considering the coming-into-being, which is endemic in the Kogi philosophy, in Western cultures. Academic approaches towards indigenous cultures and the views of the Kogi as a "sustainable" way of living which appear as something distant we wont be able to commit to, draw our ways of engaging with existence even farther away, setting us off in a stranded journey downstream. When bringing phenomenology and Goethean Science close to traditional knowledge and Kogi philosophies, I was able to sense a hope of change within our society with an upstream view in our daily life. When we look at the Kogi ways of thinking as a cognition that can be considered as something universal, rather than an exclusive and exquisite way of approaching life in an "isolated" tribal group, these become graspable and applicable. As the elders say, we are here to "remember".

If Henri Bortoft, Goethe, Holdrege and other members of Western culture have been able to remember without even being aware of the existence of the Kogi people, we all have the potential to "remember" and go upstream.

"No estar, sino ser el movimento"
Canción: Bailar en la cueva
Jorge Drexler

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Mariana Gomez *is a Colombian anthropologist currently studying the MSc in Holistic Science program at Schumacher College. She works in the field with indigenous and peasant communities on territory, environment and natural resource management and is deeply committed to supporting locally based decisions. She helps voice the message of respect towards peoples beliefs and knowledge of being part of a living system.*

ABSTRACTION AND EMBODIMENT

SHANTENA SABBADINI

Abstraction in the era of information

In the past century science and technology have brought about changes that deeply shape our world and our future, both in terms of matter and psyche. Traditional myths and symbols, rooted in millennia of our history as a species, have lost much of their effectiveness for comprehending our present reality. Traditional religious narratives are undergoing a deep crisis in most technologically advanced parts of the world. Science, while in a sense representing 'the new religion', is by itself incapable of providing meaning and ethical guidance and therefore cannot fill the gap left by the retreat of mythological consciousness.

If the 19th and 20th centuries have marked great advances in our ability to control vast amounts of energy, the key to understanding the civilization of the 21st century is the mastery of vast amounts of information. We are becoming an information centered culture. And this process is accompanied by a parallel change in the way we represent the world, and therefore also in the way we relate to each other and to the planet.

One way to describe this shift is in terms of the balance between the right and left hemispheres of our brain. According to the psychiatrist and neuroscientist Iain McGilchrist, the brain hemispheres correspond to two different styles of processing information (McGilchrist ,2010). The right hemisphere takes in and elaborates predominantly overall patterns, complete gestalts, and tends to respond intuitively to new situations, while the left hemisphere focuses on details, builds analytical representations of reality based on past experience. The tragedy of our times, according to McGilchrist, is that we have become predominantly left-hemispheric beings. We value the approach of the left hemisphere over that of the right hemisphere, we have downplayed the intuitive capabilities of the latter and have focused predominantly on the former's ability to calculate and build exact predictive models.

I am no expert at neuroscience, and the right brain/left brain model is far from being unanimously accepted by the neuroscience community. But I believe that there is an important kernel of truth in McGilchrist's approach, which is not strictly dependent on the right brain/left brain model. The essential point concerns two different styles of representing the world and orienting our action. I will call them 'embodiment' and 'abstraction'. The first takes in reality as an undivided whole, is close to lived experience and relies on pre-verbal, intuitive, largely unconscious processing, in which emotions play an important role. The second one is verbal and analytical. It relates to the world in terms of models and representations. Emotions may be an object of study for it, but their intervention in information processing is viewed with utmost distrust: the ideal of this mode is cool and impersonal.

In terms of this duality, our culture is strongly unbalanced in favour of abstraction and tends to lose sight of embodied experience. We relate to the world in terms of concepts, models and representations, which take on in our thinking and acting a higher degree of reality than the embodied experience that is their ultimate foundation. We live an increasingly virtual life in a world of signs that have replaced the concrete realities they point to.

Science

The highest form of abstraction is science itself. Modern science rests on experiment as its foundation. Scientific consensus is based on the repeatable character of scientific experiment. If I carefully describe an experiment I am performing today here in Totnes, you are supposedly able to replicate it in Tokyo next month obtaining the same results. That is what makes cumulative progress possible in science. And that is what gives science its predictive edge. But what

gives the scientific experiment its repeatability? Obviously no real, concrete situation is ever fully replicable. What can be replicated is an abstract skeleton of the concrete situation: those aspects of it that can be exactly described and measured. All the rest of it is unmanageable, and therefore irrelevant, for scientific enquiry.

The fact itself that this strategy is successful is remarkable. That is the realisation that Galileo phrased as "the book of nature is written in mathematical characters": mathematics is the highest level of abstraction in the description of our experiences. There is no doubt that the strategy of reducing the complexity of the real to its mathematical skeleton has great predictive power. And predictive power means technology, i.e. means power *tout court*. There lies the great seductive power of science. Blinded by its dazzling seductive power, we forget about the process of abstraction that lies at its base. The abstract model we have built suddenly becomes more real in our eyes than reality itself, the dry skeleton more real than the blood and flesh of the body.

While the achievements of science are truly astonishing, it is crucial not to forget what we have left behind. Abstraction is no problem if we remain aware of the founding operation that has generated it, i.e. the reduction of the fluid and infinitely complex lived experience to a repeatable core of abstract properties. The trouble is we forget. Our scientific models of the world take on a higher degree of reality than our lived experience. We assume the data of the senses to be fallible, and only rational analysis to provide a trustworthy picture of reality.

I should probably qualify the previous statements: the postmodern sociology of knowledge has devoted considerable attention to deconstructing the naive assumption that equates representation with reality. But its critique hardly achieves recovering the fullness of embodied experience. The critique itself is formulated in the language of abstraction and therefore its impact hardly reaches the world of everyday life, in which a medical doctor's description of the state of our body has greater authority than our own experience of it.

The economy

A crucial form of abstraction that has a tremendous impact on our lives is money. What is this elusive thing we call money? Its presence is ubiquitous and carries great weight in our daily interactions, yet its value seems to be purely conventional. It is the supreme abstraction of mercantile dealings, the general measurement of all exchanges of things or services. As such it is a clever invention: thanks to it, if I am good at making shoes but I need a hat, I don't need to find someone who is good at making hats but needs a pair of shoes. The conversion of all these things into money efficiently solves the problem. The trouble is that this clever device takes on a life of its own, this useful servant becomes a tyrannical master.

Long ago money was a thing among other things, and used to take on various concrete embodiments, like cowrie shells or handicrafts. Eventually its favorite embodiment came to be metal. But even then its "thingness" was rather superficial: Roman emperors quickly discovered that metal coins can be "shaved", saving on the metal while keeping the nominal worth of the coin unchanged. In modern times the "metal embodiment"of money has been represented by the gold standard, the supposed convertibility of money into gold. But that also is long gone.

Today the circulation of money on the globe is estimated at four trillion dollars a day. This does not include the circulation of derivatives ("futures"etc.), which is estimated to be considerably larger. 2% of these four trillions correspond to actual buying and selling of goods and services. 98% of it is purely speculative, not anchored in any real exchange. That such a situation is intrinsically volatile is only too obvious.

According to modern monetary theory, the nature of money is that of a credit-debt document. The notions of credit and debt are of course very ancient, much more ancients than money. In primitive economies, 'gift economies',(Sahalins, 1972) the credit-debt balance was realised through the exchange of gifts. Custom would in some measure regulate this exchange, which nevertheless would

remain something quite concrete and tangible, shaped by personal relationships with all their nuances, symbolic aspects and emotional charge.
In modern economies money with its abstract measurability replaced all that relational complexity and rendered exchanges much more rapid and efficient. Money is a useful servant, but it can turn into a tyrannical master. Left to itself (in a 'free market'economy) it has a disastrous impact on the cohesion of human society and on the life of the planet. Two characteristics of the money dynamics are crucial in this respect:
- a tendency to exponential growth of all economic activities
- a tendency towards concentration of money in the hands of a few
Exponential growth - Money, as the universal exchange medium, is desirable and therefore can be offered at an interest. Repaying interest implies producing more than the equivalent of the borrowed money. The natural course of a free market economy is a constant rate of growth of production. That means an exponential growth of the volume produced (and a corresponding exponential growth of resource depletion, waste and ecological impact).
Exponential growth of the economy on a finite planet means we are on a collision course with mother earth. We are destroying what supports our own life and that of all our fellow creatures. Eventually we may end up destroying ourselves.
Concentration of wealth - Owning a lot of money gives you a better opportunity to acquire more money than if you have just a little. This not only through the straightforward mechanism of compound interest, but much more significantly, at a larger scale, e.g. the scale of multinational corporations, through being able to shape the playing field of your financial and economic activities (buying information media, lobbying, bribing, etc.). This being so, the inevitable outcome of a free market economy is inevitably the concentration of wealth in the hands of a few. This point has been admirably argued by Thomas Piketty in "Capital in the 21st Century",(Piketty, 2013) with a rich historical documentation about the tendency of wealth to concentrate and a sophisticated analysis of the factors involved. Piketty's solution to this basic contradiction of capitalism is a global progressive tax on capital (which he calls "a useful utopia").
The most serious consequence of concentration of wealth is not necessarily the impoverishment of the masses, although this is frequently the case, especially in the Third World. A conceivable relatively optimistic scenario (at least in the short or medium term, before the depletion of resources and deterioration of the environment goes too far) is that the economic condition of the poor majority remains stable or marginally improves, while the rich minority becomes enormously rich, i.e. the gap between rich and poor becomes huge. Even this relatively optimistic version of the future is not at all a desirable scenario. It creates two races of people and spells the end of the dream of democracy.

Media and communication
A third aspect of the predominance of abstraction in our culture is the role virtual reality and electronic communication have in our lives. This is something so obvious it hardly requires any comment. e.g., video games and social networks are a large part of teenager reality in all developed countries. When my partner's kids join us in watching a film on the computer, she and I simply watch the movie, but the kids watch the movie, play a video game and chat with friends on what's app, all at the same time.
TV, films, video games and advertising contain an increasing concentration of stimuli. We are bombarded by an amount of information incomparable with anything of the past. And all this information is competing for our attention. The competition is mostly through images carrying the strongest possible emotional charge. Sex, blood and violence are standard ingredients: and, as the audience gets accustomed to them, higher doses or more gruesome forms are supplied. A shocking and highly significant phenomenon is how often acts of violence are video recorded by the perpetrators. It is as if the act itself loses

significance compared to its being recorded and being shown off

Artificial Intelligence

The culmination of this trend towards abstraction can perhaps be seen in the idea, taken seriously by a growing number of neuroscientists, that it will eventually be possible to transfer human consciousness onto an artificial non-biological support, i.e. to build a conscious robot. Some view this as the key step to permit space travel beyond the limitations imposed by our organism and eventually to perpetuate human culture beyond the survival of life on this planet. While this may sound like Promethean hybris, a projection of the power of our knowledge and technology way beyond what can be reasonably claimed at present, we should not ignore that there is a continuum from the present identification of our culture with abstraction to these extreme projections. The prevalent opinion in current neuroscience views consciousness as an epiphenomenon of electromagnetic processes in brain circuitry, i.e. a secondary manifestation of a dynamics entirely closed in itself and in principle reproducible in purely mechanical terms. If we accept that view, the only obstacle to realising human-like consciousness on an artificial support is the complexity of the human brain, which at present still defies our technical capabilities. But many things that were beyond our capabilities a few years ago are quite run of the mill now (reproducing strands of DNA, MRI scans, etc.). So the complexity of the brain is not necessarily an unsurmountable obstacle.

The shadow of abstraction

The process of abstraction lies at the root of the entire human civilisation. Science, art, language are all built on it. We certainly do not want to throw it away. Such a thing is not even conceivable. Yet we need to be aware that, beside its wonderful creative potential, it possesses tremendous destructive power. The tragedy is that abstract knowledge offers no ethical guidance. It is like the navigator in our cars: very efficient in finding the fastest route to a destination, but dumb about the choice of the destination itself. Other factors come into play in that choice.

What fundamentally drives our actions, what chooses our destinations, arises from a deeper level of processing in our body, a pre-verbal level having to do with emotions and operating largely below the threshold of awareness. The trouble is our culture is highly sophisticated in managing abstractions and rational knowledge, but very primitive in managing emotions and embodied experience. We have focused our attention predominantly on the rational, analytical understanding of reality and have largely ignored the complementary dimension of the intuitive, emotional, body-rooted experience.

This unbalance has various consequences. We can only connect with existence, with our fellow human beings and with other creatures through our embodied experience: when that dimension is devalued and forgotten, we lose our connection with nature, we cease to be part of the dance of 'all our relations'(the Native American expression to indicate all living beings), and we plough along with our own abstract logic, disrupting the cycles of life on the planet.

From a psychological point of view what consciousness rejects and denies goes to feed the shadow, the unprocessed or incompletely processed material that we push down into the unconscious. The repressed material keeps boiling down there until it forces its way back into consciousness, erupting often in crude and destructive ways. The psychological shadow has often been compared to a sack we carry on our back. Whatever we do not want to see, we throw behind us into the sack. But by doing that we do not really get rid of it: we keep carrying it and, when the sack gets too heavy, it bursts, and we are suddenly confronted with the repressed material in rather unmanageable ways.

Our culture has privileged the abstract and the rational and has thrown into the sack emotions and embodied experience. But wisdom arises only from the conjunction of these two complementary aspects.

How can we recover the balance of these two aspects?

The separation of mind and matter

The evolution of human culture towards the predominance of abstraction over embodied experience is a long continuous process. But a few significant turning points can be discerned. Between ten thousand and four thousand years ago the agricultural revolution ushered in writing, complex social organisation, specialisation, hierarchy, the city-state, commerce, money, priestly castes, kingdoms and empires.

Between three and two thousand years ago the advent of monotheistic religions replaced the old animated world in which all nature was alive and sentient with a theocentric-anthropocentric cosmos, in which the human dialogue was no longer primarily with the world, but with a transcendental being located above the world. Thus the world was demoted to a purely instrumental role in the cosmic drama involving man and God. This transition also marked the suppression of the divine feminine and the dominance of a patriarchal culture.

The final turning point is the birth of the modern world. A number of significant events took place almost simultaneously about five hundred years ago: the Copernican revolution, which displaced the Earth from its privileged position at the center of the universe: the discovery of America and the expansion of European culture all over the world; the beginning of modern science in the great revolution that the German philosopher Edmund Husserl has called 'the mathematization of nature'(Husserl, 1970), first sketched by Galileo Galilei (1564-1642) and then carried to completion by Isaac Newton (1642-1727).

In that complex transition I will single out the philosophy of René Descartes as a significant, almost archetypical, moment for our discussion on the shift towards abstraction. Descartes is, more than anybody else, responsible for the philosophical framework supporting the development of modern science. He tackled philosophy in what we might call a scientific perspective. He set himself the task of establishing philosophy on solid ground, by identifying a foundational statement that would be true beyond any possible doubt. It is highly significant that he found the only inescapable evidence not in his sensory experience, in his concrete embodied existence, but rather in his own thinking process: cogito ergo sum is his statement of this primary evidence.

What then can he say of the outer world the senses reveal to us? It will necessarily be the abstracted world seen through the cool gaze of the intellect. The outstanding characteristic of this "corporeal nature," in Descartes' eyes, is that it appears to extend through space, a characteristic that makes it localised and measurable, and therefore subject to objective study. (Let us remember that Descartes is credited for the invention of the Cartesian coordinates, a fundamental geometrical tool for describing localisation and motion in space.) He therefore called this world of matter res extensa, "extended stuff," as opposed to res cogitans, mind, the "thinking stuff" introspection puts us directly in contact with. Res extensa and res cogitans stand in radical disconnection from each other: they exist, so to speak, on different planes. The Cartesian separation of mind and matter seals the estrangement of the modern human being from the world, the isolation of the 'I' in its ivory tower surrounded by inert, insensitive res extensa.

The scientific paradigm and mechanism

A curious paradox is that, in spite of the fact that res cogitans was for Descartes the primary evidence, historically the most significant consequence of his separation of mind and matter was that it became legitimate for scientific enquiry to focus entirely on the world of matter, res extensa, in order to discover its intrinsic laws.

Technology was taking its first significant steps into the modern era, and the machine became the key metaphor for describing the world. Describing things in terms of mechanism, of cause and effect, enables prediction, and therefore affords control over phenomena, i.e. power. It was the start of the modern world. If the world is just inert matter, if it is just a machine, the whole world is open to exploitation. But depriving the world of a soul eventually leads to human beings losing their

soul also. Our relationship to our fellow humans becomes purely instrumental: the objectification of the world translates into the objectification of our fellow human beings. If the world is reduced to its scientific description in terms of measurable quantities, the relationships between humans also get similarly reduced. Money, as the general abstract measurement of all material exchanges, becomes the ultimate criterion of all human interactions. The servant becomes the master: our own invention turns around and enslaves us.

The quantum revolution

How far do we need to go down this blind alley before we are ready for a change of paradigm? Life is a complex phenomenon, and as in our times the analytic tendency culminates, the seed of a possible reversal is beginning to sprout.

In a rather peculiar turn, this seed has first appeared within that eminently abstract endeavour that is physics. Quantum physics teaches us that the separation of mind and matter, consistently pursued in the exploration of the intrinsic laws of the objective world, leads back to the inseparable totality of mind-matter, consciousness-world. Diving deep into the heart of matter, exploring finer and finer levels of its structure, we are finally forced to realise that... matter does not exist. Or, to state it more cautiously: matter does not resemble at all our naive intuitive notion of it. It behaves in wild ways. And, perhaps more importantly, there does not appear to be a neat separation between what we call matter and what we call mind or consciousness. The two are inextricably linked. In the language of Iain McGilchrist, the ways of the left hemisphere, consistently followed to the end, lead back to the right hemisphere.

I will not attempt to reconstruct the actual historical process that brought physicists to a quantum way of thinking. I will follow instead a time honoured practice of physics by summarising a long and complex story in a single 'archetypal experiment', an experiment exhibiting in the clearest possible way the essential point without obscuring it with all the technical details that in actual fact keep people busy for decades. Here is the experiment.

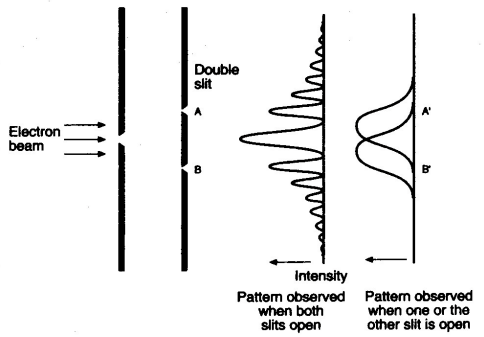

Figure 1

Some particles (let us say electrons) emerge from a source (the hole in the screen on the left side of Figure 1) and fly towards a screen which has two slits, let's say A and B, in it. These two slits can be open or closed. The electrons that cross them impinge upon a photographic plate on the other side which records their arrival: each electron leaves a black dot on the film. The question we ask is: what is the pattern of the dots we observe on the photographic plate?

The drawings on the right side of Figure 1 show the patterns we obtain when both slits are open and when only one slit is open. The curves indicate the density of the dots in various places on the film.

Let us begin with only one slit open. Just as one would expect, when only slit A is open most of the dots concentrate in front of it, with some dispersion on both sides (pattern A'). A similar thing happens when only slit B is open (pattern B').

But the distribution of black dots obtained when both slits are open is much more complex: it is the wavy pattern shown in Figure 1. That is called an interference pattern and it is characteristic of waves. It arises when two waves with the same wavelength meet. How does it arise? In some places the two waves superpose in phase, i.e. peak over peak and valley over valley: there they reinforce each other, they create a bigger wave. In other places they arrive out of phase (peak over valley, valley over peak) and they cancel each other out. The wavy pattern in Figure 1 is exactly what one would expect with two waves

coming out of each slit and meeting on the photographic plate.
Now two things are worth noticing here. First, electrons seem to have a double nature: they behave both as particles and as waves. By impinging on the photographic plate at a definite spot and leaving a single black dot they definitely behave like particles. But on the other hand these dots form a pattern which is unquestionable evidence of two waves meeting.
This is already rather strange, but there is something even stranger going on. If we get pattern A' with slit A open and pattern B' with slit B open, then we would expect to get the sum of pattern A' and pattern B' when both slits are open. That's not what happens: the wavy pattern in front is very different from the sum of A' and B'.
Let us examine this in more detail. What does our expectation of obtaining A' + B' depend on? It depends on an either/or assumption: if, when both slits are open, each electron crosses either through slit A or through slit B, without interacting with any other electron, then we are bound to get pattern A' + B'. Now the absence of interaction with other electrons can be ensured by using a sufficiently low intensity beam, i.e. by sending each electron widely spaced from all others. But then what does it mean that the pattern we observe when both slits are open does not coincide with A' + B'? It can only mean that in some sense each electron passes through both slits. Just like a wave would. It crosses the screen as a wave and it hits the photographic plate as a particle.
That's not the end of the story. Suppose that we want to clear up the issue of which path the electron actually follows in crossing the screen by placing next to slit A a Geiger counter that clicks when a particle crosses it. Now we will know which way the electron goes. What do we see when we do that? The interference pattern disappears. The pattern of dots on the plate actually becomes the sum of A' and B'. We turn off the Geiger counter: the interference pattern reappears.
This is a rather peculiar behaviour. It is as if the electron becomes localised, becomes a particle, only when we observe it, either by means of a Geiger counter or by means of a photographic plate. When nobody watches it, it leads a diffuse 'wave-like' existence, being in many places at once. It becomes 'thing-like' only upon being observed.
A final remark: this is not something specific to electrons. All the creatures of the subatomic world, whether particles of matter or particles of light, behave this way. At the micro level the world seems to be radically different from the world that our senses perceive.

Inseparability of mind and matter
I will not go into details of the debate on how to understand the fundamentals of quantum physics of which we just had a taste. Paradoxically, in spite of the immense success of quantum physics in describing the microscopic structure of all matter, a hundred years after the inception of the theory there is still no general consensus in the scientific community on the interpretation of its formalism, specifically concerning the process of observation - the so-called 'quantum measurement problem'.
It is a generally recognised fact that quantum theory cannot be consistently formulated without explicitly mentioning 'the observer'. This is a major difference with respect to classical physics. In classical physics the role of the observer is, so to speak, transparent: a fully deterministic description of the time evolution of a physical system is possible independently from its being observed. Not so in quantum physics: the quantum state of a system still evolves deterministically, but when use it to predict the outcome of an observation performed on the system an intrinsic element of uncertainty comes in. In quantum physics an act of observation is a truly unpredictable phenomenon. Wolfgang Pauli has called it 'an act of creation': it is not simply acquisition of information about something that was already there.
To move from the purely mathematical reality of the quantum state to the values of actual physical quantities we need the 'measurement postulate', which, given the quantum state, predicts the probability of a given result (e.g., which slit the electron will go through, or where it will hit the screen) for a specified observable. But the measurement postulate

explicitly refers to an observation, and in this sense we could say that mind and matter are not truly separable in quantum physics.
But there is a more literal sense in which quantum physics, while being itself possibly the most abstract form of our understanding of the structure of reality, is calling us back to the awareness of our embodiment.
The core question of the quantum measurement problem is: if the ultimate nature of reality at the microscopic level can be described by a quantum state, in which various values of physical observables coexist with various probabilities (like the electron going through the upper and lower slit at the same time), why does not the same phenomenon show up at the macroscopic level? Why the Geiger counter always appears as either having clicked or not, according to a clear cut Aristotelian, either/or, logic?
Notice that a macroscopic object, a Geiger counter, but also our own body, consists of atoms, which in turn consist of quarks and electrons, so that in principle there is no reason why quantum physics should not apply to it. Although the early Copenhagen interpretation of quantum physics implied some ambiguity in this respect, the consensus in the physics community nowadays is that no doubt it does. Then we are left with only two options: either 1) the measurement process involves some mechanism, at present unknown, that reduces a quantum superposition to the corresponding Aristotelian alternative (the so-called 'collapse of the state vector': the electron going through either the upper or the lower slit), or 2) the Geiger counter (and the observer's brain) really are in a superposition of states, but this fact is hidden from us by some intrinsic feature of the observation process.
As I said, the interpretation of the quantum process of observation is still an open matter. Is there a collapse of the state vector and what is the mechanism behind it? Or is the quantum superposition of states at the macroscopic level hidden, and what is the mechanism that hides it? Opinions differ, and what I will say in this respect reflects the bias of my own work in this field.

Quantum physics and embodiment

It can be shown that the persistence of information plays a crucial role in hiding the quantum superposition that is the end result of a measurement process (Sabbadini, 2006). If the outcome of the measurement process is in some way recorded, if it leaves a trace, the quantum superposition becomes indistinguishable from the corresponding Aristotelian alternative. All predictions are exactly the same. The quantum superposition is in all respects equivalent to (i.e. behaves like) the corresponding Aristotelian alternative.
This fact has an important philosophical consequence. Because all the information we acquire about the world (be it about the inner state of our body or the outer world) is accompanied by the formation of traces: at the very least a trace in the neuronal activity that is going on in our brain - in actuality a lot more than that. This is what 'embodiment' ultimately means: we are embodied consciousness because all our experiences are rooted in a body, all our experiences are associated with bodily happenings. But then the persistence of information argument shows that quantum reality intrinsically eludes our sensory perception. We, as embodied observers, are forever barred from directly experiencing quantum reality.
I should perhaps clarify that. We have powerful, in fact undeniable, evidence of quantum reality. Our two-slit experiment is a clear example of that. But the evidence is indirect: the correlations between various classical Aristotelian states (slits open or closed, Geiger counter clicking or not clicking, blackening or not blackening of the photographic plate) can only be explained by invoking quantum states that are superpositions of yes and no. But we never experience the superpositions themselves. In order to experience them, they should leave no trace - but then we could not experience them.
At a fundamental level therefore quantum physics reminds us that the way we perceive the world is a consequence of our embodiment. At the culmination of our journey into abstraction (science being abstraction par excellence, and physics being the most abstract

of all the physical sciences) we are called back to our embodied nature.
The philosopher Henri Bortoft compared the journey from embodiment to abstraction to the downstream flow of a river, and the phenomenological return to embodied experience to reversing that movement. If we translate the above considerations into Henri's language, we should say that at the end point of our travel downstream we meet a sign pointing us back upstream.
In this sense holding upstream and downstream together is really the challenge our civilisation is presently facing. If we manage that reversal, our journey away from our embodied experience and into abstraction will turn into a circular journey. Or rather into a spiral journey: at the end, we will find ourselves in the same embodied place, but we are not the same, we will carry within us the experience of the whole journey.

Return of the world soul

For ancient and primitive people there was no sharp separation of mind and matter, of subject and world. The 'I' had porous boundaries. Embodiment was in a sense 'enworldment', and soul, or consciousness, was everywhere. We have gradually lost that unified perception: mind has become more and more separate from body - and from world. The world has lost its soul: it has become mere matter, to be manipulated at will. And our manipulation of the world is guided by abstractions: however technically refined, that manipulation is blind in its overall purpose.
But we are after all embodied beings, and 'enworlded' beings. We cannot continue to ignore these realities without facing the consequences of our ignorance. We are at present encountering those consequences in many ways.
Just as we live in a finite body, we live on a finite planet. Fantasies of space travel, of colonising other planets, charming as they might be to our childish mind, are escapes into abstractions and help us to forget about the rotten job we are doing in taking care of this planet. As a young friend of mine commented: should we not start by taking care of this one planet we inhabit? If we are unable to care for this Mother Earth we stand on, what makes us think we would do a better job on Alpha Centauri? It is a characteristic strategy of abstract thinking to attempt to deal with the damage caused by abstraction through further abstraction. The ultimate abstraction of the consumerist society is the 'disposable planet'.
The planet is signalling in many ways that we cannot continue to treat it as dead matter. We need to return to an I-Thou relationship, not an I-it relationship, with Her. We need to return from our fascination with abstraction to our embodied and enworlded reality.
This does not mean that we will throw away all the products of our ingenuity, abandon all science and technology. But our abstract thinking will be balanced by emotional wisdom, by embodied wisdom. There we will find ethical guidance. The merging of abstract skill and emotional wisdom, a balance of the masculine and the feminine, is the key to a sustainable future for our species and for the planet.

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Shantena Sabbadini *worked as a theoretical physicist at the University of Milan, Italy, and at the University of California, Santa Barbara. In Milan he helped lay the foundations for what is now called the "decoherence approach" to describing quantum observations, presently the most widely accepted understanding of this controversial subject.* **http://www.shantena.com**

REHYDRATING THE EARTH: NEW PARADIGM FOR WATER

RICHARD WIDOWS

"The wars of the 21st century will be wars fought over water" - these are the now famous words of former UN Secretary General Boutros Boutros-Ghali, words that a growing number of authors are repeating today. But what if, instead of providing the catalyst for war, water could instead be the catalyst for deep, holistic and sustainable human participation in Earth systems?

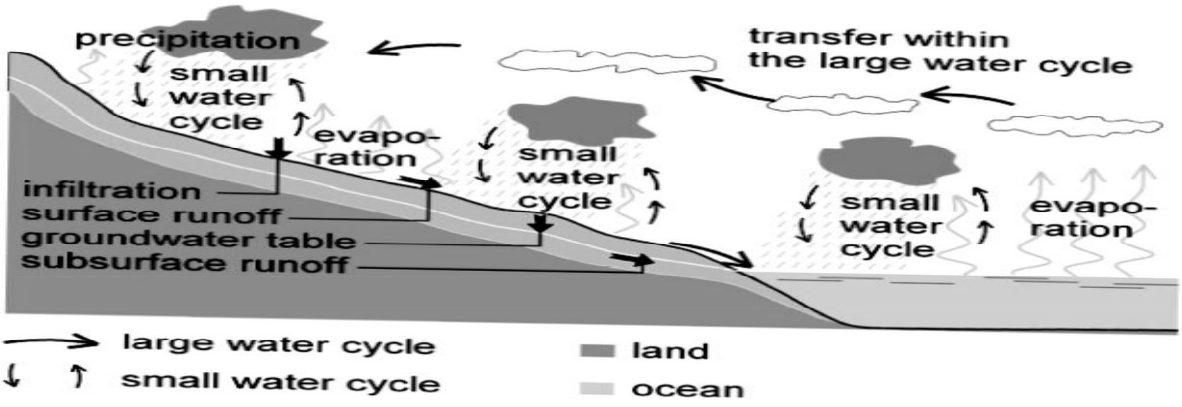
As someone drawn to holistic science and to the need for change towards big picture thinking, I struggle to think of a single area more ripe for holistic engagement than water management. I say this because, whilst my intention here is to articulate a complete paradigm shift in the way in which we think about and approach water management in our basins and catchments, none of the arguments I will be using to support this position are particularly controversial. What is unique here is approaching the subject in a holistic manner.

The development and adoption of a new holistic water management paradigm, a paradigm that acknowledges, seeks to understand, and in some instances to reverse, humanity's impact on the 'small water cycle', could be one of the most important challenges we face. The good news is that at its most fundamental level, the change in approach can be summarised in one short sentence: a shift from the current paradigm, where evaporation is viewed as a loss to the system to be avoided at all costs, to a new paradigm, where evaporation is understood and respected as the *source* of all precipitation and managed accordingly.

To understand the importance of this statement, we must first understand that there are two major parts to the water cycle - the 'large water cycle' and the 'small water cycle'.

As can be seen in *Figure 1 (below),* the small water cycle can be described as the closed circulation of water in which water evaporated on land (or water) falls in the form of precipitation over this same environment. There is nothing controversial about the small water cycle. It is simply a term that does not get used in current paradigm water management discussions.

Although it is called the *small* water cycle, don't be misled by its name. The small water cycle is actually more important to local precipitation patterns than the large water cycle. In fact, it is estimated that mean global precipitation overland is 720 mm, of which only 310 mm is from the large water cycle (i.e. Oceans) and 410 mm comes from the repeated evaporation-precipitation process of the small water cycle (Kravčík et al., 2007, p.17).



That is to say, up to two thirds of precipitation on land actually comes from the small water cycle. Acknowledgement of this simple reality alone should be enough to completely transform our approach to global water management. Furthermore, it is the small water cycle that is interrupted by human activity, and it is therefore the small water cycle that we can seek to act upon by becoming conscious of our influence upon it.
However, before I get into a lot more detail about the small water cycle and how we might influence it, I want to explore the current paradigm approach to water management, via the example of a globally relevant Australian water management planning process that I was closely involved with, the Murray Darling Basin Plan.
The Murray Darling Basin is one of the largest and also driest river systems in the world. Running from central Queensland, through New South Wales and Victoria, and eventually, down into South Australia where it meets the sea near Adelaide, the Murray Darling Basin covers an area of 1,059,000 square kilometers, around 14% of the Australian continent (MDBA, 2014a).

Entire books have been written on the political complexity of the Murray Darling Basin, but to get an idea of its significance it is important to understand that the basin contains approximately 40% of Australian farms and around 70% of Australia's irrigated land (MDBA, 2014b). In addition to this, the Murray Darling Basin is also the primary water source for a number of significant towns and cities.

Essentially, the Murray Darling Basin Plan was a multi billion dollar Federal Government initiative designed to redistribute a perceived over-allocation of water resources, in the hope of revitalising the basin environment. This process was initiated following a decade of the worst drought on record, and in the light of scientific predictions of increasing climate variability resulting from climate change.
The Murray Darling Basin planning process involved four separate state Governments and countless stakeholders all seeking individual outcomes. At the broadest level the Basin Plan operated on the premise that allocating more water to environmental sites was the best we could do to 'fix' the perceived environmental problems in the Basin.
However, whilst certainly effective in reallocating water to the environment, the Basin plan never got to the deeper level questions of water management, such as: is human activity playing a role in increasing climate variability? And if so, what can we do to begin reversing these trends? In other words, in over four years of being involved with the Murray Darling Basin Planning process, I heard almost no discussion about the water cycle and how human activity might be influencing it! *This* is where I believe our approach to water management needs to change.
Luckily, in Australia we do not have to look very far for examples of pioneering water management practitioners who have adopted a far more holistic approach. P.A. Yeomans, for example, released his first book '*The Keyline Plan'* in 1954. The Keyline approach seeks to re-mould the landscape using specialised methods of planning and design based on water control and land management. The primary aim of this approach is to increase the depth, stability and fertility of soils (*Yeomans, 1954*). Over the past three to four decades, Keyline practices have become a significant addition to the Australian rural landscape, forming, among other things, a key platform upon which the permaculture design process is based.
More recently, another Australian farming pioneer, Peter Andrews, has come up with his own philosophy on landscape rehydration and ecosystem restoration, 'Natural Sequence Farming'. Like Yeomans, Andrews places his major focus on the restoration of degraded soils. Based on the knowledge that soils have the capacity to hold twice as much carbon as the atmosphere, Natural Sequence Farming is designed to restore ecosystem functions by "re-coupling the carbon and water cycles" (Norris & Andrews, 2010). This approach is unique in its attempts to create managed systems designed to mimic natures own

design, and has achieved significant success in its short history in Australia.
Being Australian and having worked in Australian water policy I am more in touch with Australian examples, but that is not to say that there are not also interesting global case studies as well. India's Rajendra Singh and Zimbabwe's Allan Savory are two leaders that come instantly to mind.

Often referred to as the 'Waterman of India', in 1984 Rajendra was working to set up health clinics in the state of Rajasthan when he was told that they needed neither medicines nor food, but water. This simple statement led Rajendra on a journey of learning and action that resulted in him being named as one of the 50 people who could save the planet (*Guardian, 2008*). Rajendra's work is particularly interesting not only for its focus on traditional methods of water conservation and unique approaches to community engagement, but also for its irrefutable and broad scale success. By working with the local community to build over 10,000 strategically placed small dams or johads, Rajendra has been able to help bring water back to over 1,200 villages and restore the water flow of seven rivers in arid areas of Rajasthan in India.

Allan Savory is a Zimbabwean born biologist and farmer behind the concept of Holistic Resource Management. Savory's area of focus lies in what he terms "brittle environments" (up to a third of the worlds lands), which he defines as "areas where there are prolonged periods of the year in which conditions for plant growth are adverse" (Savory, 1983). Over the past few decades, Holistic Resource Management has achieved significant success by using livestock to mimic the herds of native wildlife that once roamed the world's grasslands. This method is particularly interesting for its unique approach to addressing desertification in a significant proportion of the world's lands.
This list is by no means exhaustive, these are simply four prominent examples of pioneering individuals who have taken a more holistic view of the role of water in our environments. And, importantly, they have been achieving remarkable results over varying periods of time. The sort of results that prove that we can reverse trends of global desertification and begin to rehydrate our landscapes. Results that, in my view, provide significant hope for the future of humanity.

Interestingly, the more I look at these, and similar approaches, the more I feel they are all intrinsically connected. Essentially, whilst they may use different techniques and means, they are all rooted in a holistic understanding of the key role of water in our ecosystems and environments. What appears to be missing is a language to bring these pioneering approaches together. A language that can explain why these approaches have achieved real, demonstrable results, whilst not requiring us to align ourselves completely with any one specific philosophy or individual. Enter Slovakian hydrologist Dr Michal Kravčík and his colleagues, and their call for a 'new paradigm in water management'.

I first came across Dr Kravčík via a book he co-wrote in 2007 called - 'Water for the Recovery of Climate - A New Water Paradigm'. At this time I had been working in the water policy space for four years, and this was, remarkably, *the first time I had ever heard anyone mention the small water cycle*.
Kravčík himself was the recipient of the 1999 Goldman Environmental Prize for his work in galvanizing support to halt a proposed mega-dam project that had been planned during the communist era. He achieved this by proposing a series of effective, democratic and cost effective alternatives, including smaller dams, decentralized water management, and restored farmlands (*GEP, 2000*). Possibly just as importantly, in articulating what I will refer to as the 'new water paradigm', Kravčík and his colleagues have provided something that may have much broader impacts on water management - *a new language to unite holistic water management practices from around the world.*
As I've already alluded to, a fascinating aspect of the new water paradigm is that, as Kravčík and his colleagues describe it, "...it is not founded on new, revolutionary knowledge; its

newness arises more from thinking through existing knowledge to its logical consequences" (*Kravčík et al., 2007 pg. 7*). The most important concept to understand about the new water paradigm is that its proponents believe that the leaching of fresh water from land into the oceans is one of the most significant factors not only in global desertification, but also in climate change. Essentially, the new water paradigm explains how human activities, such as deforestation, agriculture and urbanisation, have gradually reduced soil moisture, ground water, and vegetation, which in turn have reduced on-land evaporation, *completely interrupting the small water cycle*.

If there is anything revolutionary about the new water paradigm, it lies in its focus on the small water cycle. The new water paradigm is, essentially, a "plan for saturating the small water cycle through the conservation of rainwater on land" (*Kravčík et al., 2007 pg. 7*). In fact, if you have problems talking about a new water paradigm, drop it altogether and just start thinking and talking about the small water cycle.

The new water paradigm, rather than focusing on dams and rivers, focuses instead on slowing down the progress of water through the system, holding it in soils, vegetation and groundwater systems, based on the knowledge that the small water cycle will ensure that water is continually cycled through the landscape before eventually returning to the ocean. In simple terms, the new paradigm for water focuses on getting the most possible value from water on land via the small water cycle.

As I explained earlier, it is the small water cycle that is interrupted by human activity, therefore its absence from policy discussions highlights the disconnect inherent within current paradigm approaches to water management. The best example I can think of to highlight this point involves a debate often referred to in Australia as the "war of the willows". This debate revolves around a premise that willows are particularly thirsty trees, and, as they are an introduced 'weed' species, removing willows could save up to 5.5 megalitres of water per year, per hectare of canopy area (*Doody & Benyon, 2011*).

This is an argument being put forward by the peak science body in Australia, the CSIRO, and is therefore highly representative of the current paradigm approach to water management. The problem is that the argument in favour of removing willows completely ignores the water once it has been 'used' by the willows: it completely ignores the small water cycle. This is the point; almost all policy relating to water management ignores the small water cycle.

Once water has evaporated it is gone as far as our current paradigm thinking is concerned. The current water paradigm views water primarily in rivers and dams, and less so in ground water, as 'real' water. Almost all water policy is geared around the regulation of these forms of water, which is understandable given that water has become a highly valuable commodity. The problem is that this approach to water management has led us to forget about the other areas that water is held in our environments, such as soil, vegetation and the atmosphere; or worse still, as in the example of the willows, to actively discriminate against water in these states.

When we think in terms of the new water paradigm, we understand that trees (and all vegetation), instead of being 'users' of water, are instead key regulators of water in the environment. Indeed, we begin to think in terms of the role that plants are playing in the circulation of water and in the transformation of solar energy, as temperature regulators.

At this point we are in danger of entering into a level of complexity that is beyond the scope of this piece to articulate. Nevertheless, it is impossible to think holistically about water and ignore the role it plays in the broader environment.

One of the key premises of the authors of the 'new water paradigm' is the roles that water and vegetation play in concepts such as 'the greenhouse effect' and 'global climate change' have thus far been greatly neglected (*Kravčík et al., 2007 pg. 23*). The primary reasons provided for this neglect relate to the fact that the circulation of water is extremely dynamic

and complex, often involving innumerable mutually connected processes. Instead of being treated as an important greenhouse gas, water is instead treated as somewhat of a climatic constant and therefore not included in many climate models. However, this approach dramatically underestimates the importance of water in the climate (*Kravčík et al., 2007 pg. 29*).

Whilst the role of water in our climate may be under-researched, what is certain is that a key condition for the alleviation of climate change is the renewal of basic ecological functions that are closely associated with increases in water and vegetation on land. These functions primarily include the "soft dissipation of solar energy through the cycling of water" and the increased absorption of carbon dioxide and conservation of nutrients on land associated with increased vegetation (*Kravčík et al., 2007 pg. 29*).

By beginning to become conscious of how human activities have contributed to the leaching of water from land and into the oceans, we can begin to employ policies and practices that seek to reverse these trends. By acting to increase the amount of fresh water on land, we would, by default, increase the diversity and resilience of our ecosystems. In turn we will begin increasing the organic content of our soils and landscapes, pulling in large volumes of carbon from the atmosphere.

The details of the 'new water paradigm' are far more complex than I have been able to convey here. However, what stands in our favour is that there are numerous global examples, such as the four I have listed here, of tried and tested new paradigm aligned philosophies and practitioners. Our work now involves drawing these examples together and looking at them through the lens of this new water paradigm, to develop a common language for articulating how these results are being achieved and why.

The choice is simple, we can continue to ignore the role of humanity in the dehydration of small water cycles across the globe, and attempt to apply increasingly large band-aid solutions, as I experienced in the Murray Darling Basin Planning Process. Or, we can pick up the initiative that has been offered to us by these many pioneering water practitioners, and make genuine attempts to create a sustainable future through this new paradigm for water.

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Richard Widows *completed the MSc in Holistic Science at Schumacher College in 2014. He has a passion for sustainable food systems and agroecology, and runs a website forum for the discussion of these issues. Among other roles in the agricultural sector, Richard worked for over four years as the Water Policy Manager for Australia's largest state farming organisation.*

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ALCHEMY: A MODERN VIEW

SEAN FERRIS

The great work in a Consumerist Society

Alchemy has all but disappeared, but some of the great scientists were practitioners, including Sir Isaac Newton and Robert Boyle. It had a complex number of goals but two core aspirations were constant. The exoteric search for the Philosopher's stone –a substance which could transform Lead into Gold and the esoteric, the discovery of a panacea which brings about longevity, immortality and ultimately redemption. Like Newton before me, I am a dowser, my expertise though is in human health and several years ago, after looking at the accepted roles of elements in the body, I dived into the periodic table. A surprising pattern emerged that made me look at Alchemy with renewed interest.

Whilst looking at clients with a gluten allergy, I began to see that they had high levels of copper not only in their intestines but also in the right side of their brains. In order to understand more I dowsed through the elements and found that the precious metal Palladium was being absorbed poorly in the same area. Palladium though known to be present in the body, as most of the elements are, is only found in parts per million and therefore thought to have no biological role. It was however used as a treatment for Tuberculosis before antibiotics. This information chimed with something I had already realised – all those with a gluten allergy had a predominant Tubercular miasm. Samuel Hahnemann (1755-1843) the founder of homeopathy initiated the idea of the miasm. Although he cured many patients, he found that they might return with ailments that may have moved site, as in the case of a skin rash, or with altered symptoms, someone cured of arthritis for instance returned with headaches. He surmised that a shadow or miasm generated by an ancestor contracting certain diseases left its mark on his patients (by what might be called genetic inheritance).

Tuberculosis was one such disease, Leprosy, Gonorrhoea and Syphilis comprise the others. Since a possible link between a precious metal and the miasms had presented itself, the next step was to dowse those people with the other miasms. A very obvious pattern soon emerged, those with the leprosy or psoric miasm were low in Lithium (which is not a precious metal but has fascinating properties) and were high in Strontium; the gonorrhoea or sycotic miasm gave rise to low Platinum and high tungsten. The Syphilitic miasm was however the most revealing, since in every case there was a lack of gold and an excess lead. This of course was the first hint of Alchemy and spoke of one of its primary goals, Chrysopoeia, the transformation of a base metal into gold, albeit reversed. Of course what I felt was happening was not a transformation but a replacement. These relationships I had uncovered between base and precious metals begged some questions. Was the body the crucible for the 'transmutation' of lead into gold which in fact leads to internal health not external wealth? While the base metals, copper, tungsten, strontium and lead will all oxidise drawing oxygen out of the organs and blood, the precious metals do not. They are immortal and untarnishing. So it may follow that if the miasms are responsible for all chronic diseases as Hahneman believed, it may be that the precious metals even in minute amounts have some part to play in restoring health and as I will try and show, this may be a broader idea than just physical or human wellbeing.

Through a glass darkly

Before examining what role precious metals might play in the body, it is worth talking about what a holistic, or truly effective system of health might look like. In my experience it should be a clarifying of the relationship between the inner world of a person and the outer world of nature. The healer acts as an intermediary enabling this clarification. True healing happens on the subtlest level as when

a homeopath for instance matches the memory of a plant, mineral or even disease to someone's need so that they achieve their own healing, the body and soul understands its own lack and remedies it. This is why it is said that the sage is the greatest healer since he or she perceives the listener's need and very simply weaves the story that brings enlightenment and balance. Instead of an out there and in here model that this would imply, I would like to introduce the idea that it is more like the polishing of a mirror so that the self is reflected back to one clearly. This calls for a much broader idea of the self.
With this in mind it may be seen that all disease, addictions and similar self-harm are part of a distorted view of the self which attempts to reach out to fill a lack and heal itself but due to the distortion reaches out excessively or misguidedly. All disease could therefore be seen as a form of pica.
(Pica is the persistent craving and compulsive e ating of non-food substances). As when a pregnant woman eats coal for carbon. The pica, when it comes to the precious metals I suggest, is both monstrous and subtle. In order to clarify our sometimes very ancient relationship to them it requires using that most powerful and subtle of methods - story, especially etymology and mythology.

Cities of Gold

Aurum, as Gold is known in Latin, comes from the ancient Roman word 'Aurora' which is the morning glow or the light of the dawn. What I take this to mean is probably what it's always meant on a poetic level, the return of the sun, the light and ultimately, for hope.
Lead can be summed up in such phrases 'as heavy as lead' or 'leaden-hearted', the definition of which is destitute of feeling. Plumbum is its Latin name and of course plumbing the depths is associated with reaching a low point. If gold is associated with the undying light of the sun and looking to the heavens, lead is the nadir of that state, a plunge into the murky oceans, devoid of light. It represents a state of hopelessness or despair.
This state of hopelessness is exactly what gold is used to treat in homeopathy. Aurum is a remedy for depressive people and for those likely to commit suicide. Devoid of hope, the dawn for these people never comes. Those with a syphilitic miasm are prone to addiction. This can run through families and be a generational search for answers in the depths of a glass.

And so to Syphilis, that terrible disease - does it have a connection to Gold, the Sun and to Hopelessness? Again story, myth and etymology clears the shifting miasm that veils its deeper story.
In 1495 Naples' citizens succumbed to a disease that ravaged their skin, disfigured their features and ate them down to the bone. German humanist Joseph Grunpeck later wrote that the sickness was "So cruel, so distressing, so appalling that until now nothing more terrible or disgusting has ever been known on this earth."
The most supported theory about Syphilis' introduction to Italy is that it came back with Columbus' sailors from 'over the ocean blue'. This would mean that fellow passenger Syphilis travelled alongside news of the New World's discovery. If my theory is correct, then as the Mayans, Aztecs and particularly the Incas were being robbed of their Gold on a grand scale, and Syphilis was stripping the Gold from European bodies on an equally grand scale.
And Syphilis, why that name? In 1530, the name was first used by Italian physician and poet Girolamo Fracastoro as the title of a poem describing the ravages of the disease in Italy. It was written as a myth centred around the eponymous shepherd boy who instead of sacrificing to Apollo begins to look to humans for guidance. The Sun god punishes the boy with the symptoms of the disease. This naming is an extraordinary coincidence since this disease which robs gold from the body is brought from the continent that used that metal to worship its Sun Gods. Many of these civilisations had the sun as its major deity. Gold, seen by the Aztecs as the sweat of the sun, was removed from the sun god's temples as the sweat of syphilis formed on European temples.
In time, we tamed this deadly beast that stampeded through Europe. However it is a

recent victory, as it was the advent of antibiotics which has insulated us from the fear it engendered for 500 years. But its legacy goes marching on in the bodies of all those with the miasm.

Gold, hope, lead, hopelessness, the sun and syphilis, a grouping of elements, emotions, a disease and a celestial body that when written seem to defy connection. The connections also seem to defy causality and throw up more questions than they answer. Does a loss of hope lead to the disease? Is the disease a punishment from an angry god? How does gold connect to the Sun? Clarifying these connections required me to look for a simple but elegant answer. Only one presented itself, one that Newton might have approved of, the classical, alchemical element of Fire. The fire of the sun, the fiery colour of gold, the burning nature of the disease and fire's absence in the darkness of the depths. The classical Elements (capitalised from now on) though dismissed as childish in a post Descartes world, may actually be the lens through which such diverse connections can be spoken of. Poetic, visceral and Universal all at once. It also promotes a viewpoint which lifts us out of judgement since an imbalance of Fire may well be something that occurs on a planet-wide scale not just to one individual, nation or even continent.

Yet each man kills the thing he loves
Oscar Wilde

To further illuminate this Elemental view, it is worth exploring Tuberculosis to see if the interweaving patterns repeat with this disease. Etymologically, Palladium is named after the asteroid Pallas and the asteroid is named after Pallas Athena, the Greek goddess of wisdom. Copper, the base metal for Palladium, is named after the Greek island of Cyprus. So far no association but if one digs deeper, the parallels become more obvious.

Athena took the epithet Pallas from her closest friend whom she accidentally killed during sparring. She took the name of her friend as her own and was known subsequently as Pallas Athena. The island of Cyprus is named after the tree which in turn is named after a youth called Cypriassus who was given a deer as a gift from the besotted God Apollo. Cypriassus, inconsolable after accidentally killing his beloved deer, told Apollo that he wished to weep for ever. Apollo reluctantly turned the boy into the Cypress tree, whose sap resembles flowing tears.

How do these parallel stories of self-induced loss relate to tuberculosis? One of the main symptoms of tuberculosis is pleural effusion, a filling of water in the membranes of the lung and the other is what gives it its other name consumption. The sufferer literally drowns in his own water and wastes away or is consumed. This describes Cypriassus' state. He is filled with tears and consumed with grief. If gold represents Hope due to its name then in what way may Palladium represent Wisdom? The Tubercular miasm's state is one of restlessness, however it is something that emerges out of a feeling of isolation or more correctly grief, feeling left behind or separate, wisdom may in this case be seen as being the opposite of this state. An understanding that we are never truly separate. Athena herself embodied a memorial to her friend and so found a way to deal with tragedy and loss. The Elemental principle that ties Palladium, Copper, Wisdom, Isolation and Tuberculosis together is of course Water, the Element that leaks from us as we wish to make contact with the thing we have lost.

Retail Therapy or As Within so Without

It is one thing to identify Alchemy as something that emerges through looking at human disease but for it to be useful and relevant it must say something about the modern world too. To many of us these diseases, leprosy to tuberculosis, seem confined to a bygone age as antibiotics have largely consigned them to being shadows of the killers they once were. In the 1930's, Syphilis was still killing 60,000 people per year in the US alone. In 1815, one in four of the population of Britain was killed by consumption. In 1999, 33 people died of syphilis in the US and in the UK, in the same year, 393 died from TB. In what way then can Alchemy and an understanding of the principle Elements be relevant to the way we are living

now that seems so out of balance with our world?

Let us look more closely at the most prevalent miasm of these times, Tuberculosis and in particular at its older more descriptive name Consumption. This comes from the Latin Consumere "to use up, eat, waste," emere means "to buy, take". So consumption in terms of the disease is to be eaten or used up and waste away, but if this internal experience is turned around and expressed outwardly it is to consume, eat up, to buy and to waste.
This is where a picture of holistic health with Alchemy at its heart becomes a radical notion. It poses the question that what if this consumerist, diseased behaviour we are in the midst of is the result of a monstrous and subtle Pica, with a distorted view of what our needs are at its heart? Since the majority of us are affected by this miasm, it would mean that any organisation, business or government would share this distorted view and therefore exhibit short-term or addictive behaviour.
In order to explain why this might be, I shall pose another question; what if the symptoms of this disease are to be expected? It is said that childhood diseases are there to stand as markers in a child's development – what if we, humanity, are passing through a particular phase, a Tubercular phase, a phase of Water or more commonly as these things are expressed a Palladium age? An age where the imbalance within us is reflected out there in our acquisitive, destructive and wasteful urges. Where water is rising, ice caps are melting, rainfall changes are key, water is the new Gold and our own sense of collective grief at the state of the Earth we love is so deep. Cypriassus' deer could well stand in for the gift we have been given and yet through our own wayward actions, are destroying.

Defining our collective disease, or era in this case, is often the beginning of a way through. The beginning of a light at the end of the tunnel or the light of the dawn. It does seem that a way of defining our particular time frame has been lost and with it some perspective. We can call it the modern era but this tells us nothing, now is always the modern era. If this diagnosis is correct then it would need to be contextualised by defining what ages precede this one.
To do this I shall turn to those wonderfully simple and clarifying principal Elements and especially the order that they are commonly written in. Earth, Air, Fire and Water. This correlates with the order the miasms are given in Ian Watson's book - *The Homeopathic Miasms - A Modern View*.

The Earth or Stone Age: Ian Watson looks at the psoric miasm as though it were the 'first challenge to humanity', its expression is in terms of survival, temperature fluctuations, thirst, hunger. It is a body at war with itself and like all the miasms it embodies a dichotomy, in this case, War and Peace. Lithium is the metal for the Psoric miasm, this comes from litho meaning stone. It is a time when humanity dwelt in caves and used just the body or an animal for power and transport. The tribe or neighbouring tribes would have been all that was known.

The Platinum Age: The Sycotic miasm I relate directly to Air. There is no handy etymology to fall back on. Platinum means little silver but the diseased state is very forthcoming. These people find it very difficult to speak out. Tungsten, meaning heavy metal, sits on the lungs when it is in excess and these people can feel a great deal of shame which halts their expression. This shows the dichotomy it embodies; Beauty and Shame. The Platinum age would be a time when the power our ancestors used came from wind for sails and mills. It was a time when travel would take place between other nations or states.
The Golden Age: Whose disease is Syphilis, could still be seen to be ongoing since it is concerned with Fire. Its power is combustible from coal, oil and gas. Other continents become easily within reach.

The Tubercular or Palladium Age: Is very much now. It is concerned with Water and its power is electricity, the power of lightning, hydroelectric. Electricity enables global, near instantaneous communication.

The pattern shows an expanding consciousness of the world we inhabit and increasing globalisation. The power harnessed in each era increases greatly, almost exponentially through each age. Of course there are overlaps as with oil and electricity being easy bedfellows and as there is when the miasms are expressed in the human body and psyche. In the interests of getting a holistic view, another template may be applied with the question, what if each age not only represented a time span in humanities' life but also stood for periods in an individual's lifespan. Through dowsing I set these ages at 7 years, except the first, Lithium again is a special case. The cave-like womb represents the age of Earth. The age of air, includes the beginning of speech and its infancy up to 7. The first kindling of desires and wants of childhood is Fire and takes us up to 14. Water represents the teenage years awash on a sea of emotion, able to travel further out into the world, with more power but a certain lack of equilibrium. Changing perspective again this time from individual to humanity would mean this Platinum age is humanities' teenage consumerist, irresponsible years. If this is so what does adulthood and maturity look and feel like on planet Earth?

The Fifth Age

The pattern set up by uncovering an alchemical way of looking at our past and present eras might appear to be problematic when it comes to looking to the future since many might think there are only four Elements. Fortunately there is a fifth Element, a fifth miasm and a fifth precious metal to complete the pattern. Uncovering their stories brings us to gems that have lain within our reach but remained hidden behind subtle confusion, fear and illusion. This view in no way represents any conspiracy theory on my part or any belief in wilful suppression. It is something more subtle and I hope more interesting. It is these gems that will show the true worth of a modern Alchemy, a way to illuminate a way out of our diseased state.

I see clients with the Fifth miasm and dowse for their absorption of precious metals. Although one of the first four miasms will still be showing in the right parietal lobe they all show a deficiency of a precious metal on the left side of the brain as well. This pattern is of Carcinosin or Cancer. This disease, unlike the much tamed beasts of Leprosy, Gonorrhoea, Syphilis and Tuberculosis still strikes fear into the heart. Last year in the UK a third of all deaths were due to it. If the fifth miasm and age is related to Cancer, we are well and truly beginning to grow up. And what is the age we are moving into? It is the Silver Age.

Silver is an exceptional metal. It is the most electrically and thermally conductive metal known in the universe and has been shown to have extraordinary healing capabilities. For instance, shattered bones which fail to heal with other methods will mend when silver electrodes are used on either side of the break. The relationship between Silver and its base metal can be seen to be at the heart of a fundamental story for many on planet earth. Silver in Latin is Argentum which comes from the Greek root Arg- which means white or shining. Silver is the white, shining metal - Nickel is its base metal. Nickel's name comes from Germanic miners who consistently mistook Nickel for Copper and therefore named it after a goblin, a mischievous sprite or demon in their folklore, Nick. In Britain this becomes something more sinister since we have our own version 'Old Nick' aka the Devil. The Devil has many other names - Lucifer and Satan being the most common. It is worth looking at their etymology which is a confusing read. Satan is a Hebrew word meaning "one who opposes, obstructs", Satan in Greek is diabolos (the Devil) which means "slanderer - literally one who throws something across the path of another." Lucifer is Latin for carrier of light. Why are these definitions confusing? They appear to have nothing to do with the meaning we give them today. Lucifer seems to have been the name attributed to the King of Babylon and Satan was not used originally to denote any individual entity.
"The Hebrew term Satan, describes an adversarial role. It is not the name of a particular character. Although Hebrew storytellers as early as the sixth century B.C.E.

occasionally introduced a supernatural character whom they called Satan, what they meant was any one of the angels sent by God for the specific purpose of blocking or obstructing human activity. [Elaine Pagels, "The Origin of Satan," 1995]"

A pattern emerges when it comes to the naming of Nickel, but with the origins of the devil, things become cloudy and obscured. This is compounded when I throw in the fact that until very recently, I mistakenly thought the metal that opposed Silver was Iridium. I will therefore attribute Nickel with not a story of evil but perhaps its original Germanic and Hebrew meaning of a mischievous or even divine obstruction or illusion. Silver by contrast, may be seen to be the most clarifying element. It is the most reflective of all elements with the ability to hold the memory of an image hence its use in mirrors and photography – 'the photograph never lies'. Silver and Nickel; white and shining to mischievous and illusory – the dichotomy they represent I believe is summed up in Enlightenment and Illusion.

How does this relationship relate to cancer? It could be summed up in two words: 'know thyself'. Ian Watson writes, 'A major theme that is relevant to the cancer miasm is the journey towards individuation. Carl Jung coined the term 'individuation' to describe the process of becoming a whole human being, a whole person in your own right and living your own life to its fullest expression.' If one relates this to the lesson of silver and the holistic model of health it is to see oneself reflected in the clear mirror of the self as one truly is not confused by others' fears or the majority view or the illusion that Nickel is strangely associated with. In essence this means, I believe, that we must find what we are here to do, our purpose. It is for me the essence of graduating to adulthood on planet Earth. 'As we progress through adolescence, there is a healthy throwing-off of the authority and expectations of those around us which is essential if are to find our true individual path in life.' To uncover ones purpose and to find fulfilment, theoretically frees us from the need for control over others. This is reflected in the inner tyranny of the disease which invades and takes over healthy tissue. Maturity on earth then looks very much like freedom from slavery, oppression and control and I mean that in the widest sense including all beings and the environment.

So what is the Fifth Element, what do we get when we are given the keys to the shiny new car on our 21st? Aether - the Quintessence, the all-encompassing, omnipresent substance that infuses all things. In classical Greek thought, it was the pure fresh air or clear sky, the pure essence that the gods breathed. I am no physicist but since uncovering this Alchemical pattern of precious metals and disease it has deposited me blinking at the doorstep of a debate that has been ongoing for well over a century. Aether was accepted as a scientific theory until the late 19th century as a medium which carried light and for Newton was integral to his early ideas on Gravity. It was a substance that filled the vacuum of space, a medium through which all things passed and had their being. It was a theory that seemed to die with Einstein's theory of Relativity, and several experiments that seemed to refute its existence. Einstein's and Newton's more mechanistic theories seemed to be enough to explain the action of gravity and light and yet there are anomalies that will not go away. Gravity still remains a very mysterious force since quantum gravity and general relativity do not marry up, dark matter and energy seems to be everywhere without being observable. There are many out there who are clamouring for a return to an Aether- based science.
I shall not fully throw myself into the debate here and will simply outline what is speculated to be possible if Aether itself is understood and harnessed. But I will say that if we are to wrest ourselves free from the grip of purely mechanistic science, an Aether-based science may be our best hope. A connecting force pervading all things would make sense of many phenomena including dowsing and homeopathy and may well be the definition of Holism. The power of the Silver Age may be the most controversial aspect to Aether since it inevitably points towards Free energy and Anti-

gravity, the holy grails of sidelined and ridiculed cranks and charlatans. However we may not wish to be so quick to judge since we should remember we are looking through the distorted lens of the miasms and the pica fuelled addiction to oil and electricity that accompany them. Fixing these lenses would mean changing our story drastically. We may have to give up tyranny, misogyny, illness, and both killing our planet and grieving for it along with a whole host of other stories. An Aether-based science might fill the gaps in sense that have been created by relying solely on causality and mechanistic science. It would in short put back meaning, art and holism into the story we tell ourselves about ourselves and our world. If however the power used in each successive age does multiply exponentially, controlling the primal force of Aether would require us to be enlightened, responsible adults free from the taints of War, Shame, Despair and Grief, with the ability to see ourselves clearly in the mirror of the Silver Age.

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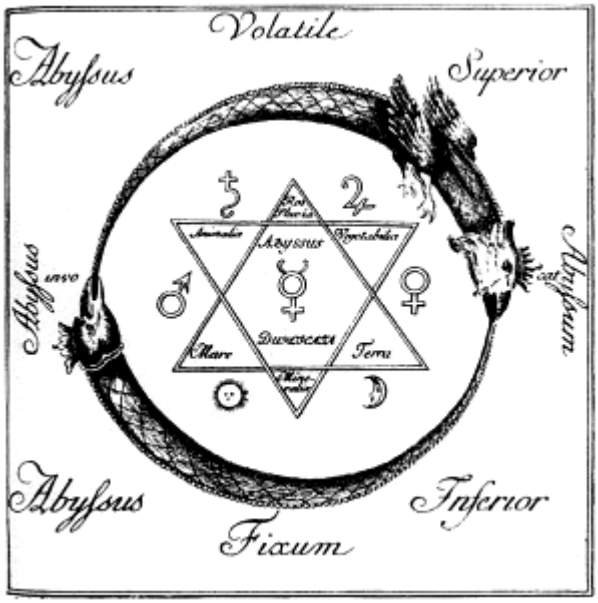
Sean Ferris *studied Performance Writing at Dartington College and Environmental Philosophy and Goethean Science at Lancaster University. He is a pioneering medical dowser (having trained with Jack Temple). He teaches and works out of Totnes in Devon.*



THE ROAD LESS TRAVELLED

STEPHEN HARROD BUHNER

Philip Franses recently asked if I would write a short piece for the Holistic Science Journal on "how my life and work has transcended the limits of academic biology and pharmacy in which I was born." There are a lot of ways to approach this question but I think the most crucial is to understand that the shift that occurs, that takes one from the dead world of ideas, of reductionist mechanical-ism, into the living world of meaning that is so exemplified in the natural world, is always personal. There is some quality within those of us who take this, at this point in time, rather unconventional move and abandon the dominant paradigm in which we have long been immersed and instead do something different. I believe there are a number of commonalities among those who take this step; I will talk a bit about the motivational forces that led me to do so and perhaps they will open up a view of some of those commonalities to the questioning eye.

Within myself, I have identified four primary aspects of my character that led me in this direction, which are, ultimately, inextricably inter-tangled. Still, I will separate them out for the purposes of this article. They are 1) extreme stubbornness; 2) an extreme sensitivity to how things feel; 3) a tendency to ask the simple question no one else has thought of asking; and 4) certain peculiarities of mind and an eccentric decision (though I think this the least important of the four).

Extreme Stubbornness

Though I was relatively docile, repressed, and introverted as a small child, at the onset of puberty that changed rather remarkably (to the dismay of my family). My family, as most do, constantly demanded that I take on certain behaviours. As examples: kiss my (unloved and unpleasant) great aunt upon meeting her at family gatherings, send thank you notes (for gifts I personally hated), sit at the table and eat with certain prescribed movements, eat foods I found offensive, clean my room to standards other than my own, dress in clothes I found uncomfortable and visually unpleasant, defer to authorities that I found unworthy of deference, believe what I was told without questioning the source, and so on.

For some reason at puberty I developed an extreme stubbornness and invariably replied to such demands with "why?" Unsurprisingly an articulate answer to my "why" rarely emerged. Generally the response, when stripped of extraneous language, was reduced to some version of, "because I said so." I found this unsuitable and despite immense pressure from my family and, ultimately, my teachers in the school I attended, I demurred. I could see, in most instances, that the older people surrounding me did not actually live fulfilled lives (so why should their exhortations be followed in the development of my own life). Nor did they seem to possess any understanding of why they did what they did. Even though my perspective at the time was quite limited by my age and experience it did not make sense to me to structure a life based on precepts blindly accepted from people who did not seem to have examined them.

Within the education system my teachers did not seem to actually understand the material they were asking me to blindly accept as foundational, nor could they coherently respond to my queries. Why does 2+2=4? (It turns out that it doesn't always do so.) What is 2? Or any number for that matter? How do you know that plants are unintelligent? Fundamentally, why is Moby Dick a better novel than The Foundation Trilogy? Why should we be exposed to one as literature and taught that the other is not literature? If sustainability is used as a measure of cultural sophistication instead of technological development, wouldn't the native tribal groups of the Americas be considered more sophisticated? Why is technological development the determinant of cultural sophistication and/or development?

In short, I learned early on to not blindly accept authority and to always question its pronouncements. This is root to my

(ultimately) refusing to accept reductionism as foundational. I think Lynn Margulis and her work is a useful metaphor here (and this connects to the third of my character qualities, the simple questions). Lynn Margulis, in her biology class, once asked about the second nucleus they could see in the cell; what was its function? She was told to ignore it. She didn't and her entire work came out of that stubborn moment of noncompliance. So, for myself, when I was told that herbal medicines were the remnant of a non-scientific superstitious past, I refused to accept it. When I was told plants, even bacteria and viruses were unintelligent, I refused to accept it. I then looked into what was true, finding it through my own experience.

I believe that questioning received wisdom is crucial to true science; there is no way to find the world of holistic science, the living world with which we are surrounded, in which we are immersed, without doing so. Because everything the Very Serious People are currently saying, leads to mechanical-istic reductionism, a dead world of ideas in which humans are the most important, and only intelligent organism. That is the paradigm they are immersed within and do not question; they cannot teach anything else.

Extreme Sensitivity to the Feel of Things

My birth family was extremely dysfunctional; my mother was, in essence, a borderline personality. When she told me she loved me, she actually meant "I hate you." However, when my father's mother, with whom I was quite close, told me she loved me, she actually meant, "I love you." Emerging into this kind of family structure made me crucially aware of the difference between form and essence, between what people said and what they really meant. Hence, in my life I learned to look beyond surfaces, to not take surface statements at face value.

How difficult it is to honour these most important of our teachers.

I learned over time that a foundational clue to the meanings I was encountering was how they felt in that initial moment of contact. In consequence, I learned to develop and trust my feeling sense. So, when I walked into a room, I paid close attention to how it felt, for the feeling state the meanings in the room engendered in me was a clue to the meanings I was encountering. When someone spoke to me, I remained extremely attentive to the feeling that emerged inside me in response. For that feeling contained crucial information about the nature of what I was hearing, about its truthfulness, about the congruency of the person speaking with what they were saying, about how they felt about me. When I was given a text to accompany a lecture or course in school, I paid close attention to how the communications within the text felt. I learned over time that truth has its own feeling, a feeling of congruency or rightness to it, that untruth does not possess. So when I was told that the world was not alive, that cultures distant in the past to our own were unsophisticated and superstitious (and we were not), that treating people differently based on their skin colour was appropriate behaviour, the feeling of those communications led me to discount them. And my extreme stubbornness kept me from being swayed by the insistence of authorities that I was wrong in discounting them.

I consider my recognition of the importance of the feeling sense to be the most important insight of my life and work. For the active feeling sense is, if attended to, what leads into the heart of the livingness of nature. It allows contact with the other intelligences with which we share this world. It allows depth perception of the workings of the world without recourse to reductionism. This is why, perhaps, there was no other quality of character that was not more intensely assaulted by those in the reductionist paradigm than this.

A standard technique of reductionists (which worked when I was young) was to analytically overwhelm me with mental commentary and data that I was too unsophisticated to respond to in any meaningful sense. I learned over time that the confused feeling that occurred in those moments was an important clue that I was being hustled. My stubbornness kept me from ignoring it.

How we feel in any given moment holds important clues to the meanings we are encountering. It is an evolutionarily innovated

capacity that allows us to access deeper meanings in the world around us. The Western world's denigration of this inherent capacity is I think an incredibly dangerous epistemological mistake; it fatally undermines large portions of reductionistic science and significantly distorts the ecological behaviour of our western cultures.

Asking Simple Questions

Simple questions really are simple (as in simpleton). They are so simple that they are rarely perceived as a question that needs asking. As an example: nearly everyone has experienced that magical moment when a puppy and a human being first meet and begin to interact but how many people have stopped and asked themselves, seriously, "What just happened?" "What is the nature of that experience?" How many people have then seriously compared the quality of that experience with their normal everyday life, analyzed the difference, come to an understanding, and then began to use that understanding in approaching the world? What would it be like if the majority of our interactions with the world around us felt that way . . . every day?

We are surrounded by exceptional events that we rarely take time to stop and contemplate, that we rarely stop to ask questions about. "What are 'invasive' plants doing when they move into an ecosystem?" "Why do my friend and I synchronize our walking and why do we feel uncomfortable when we are not synchronized?" "How did I know that the telephone was just about to ring?"

We encounter remarkable moments but we so take them for granted that we do not stop to wonder at them, to take the time to stop and immerse ourselves in the kind of wonder we knew as children, to seriously ask, "Do the cows in France speak differently than the ones in England?" That is a question that nearly all children ask but have always been told, "No, they speak the same; they all moo." Most of us just go on with our lives, accepting that bit of inaccurate software as foundational. But of course it turns out that cows do speak differently in different regions and that simple question, once correctly answered, opens up a whole world to the eye. It reveals, among many things, that language behaves similarly among other species as it does with us, that sequestering groups over long time lines leads to the emergence of unique linguistics among those species.

Allowing myself to retain the capacity to ask simple questions and to remain present in their presence has been the hardest quality of self for me to develop. I found that during much of my schooling the asking simple questions irritated my instructors; it often led, for instance, to attacks on my character. (What's wrong with you? Why do you have a chip on your shoulder? Why can't you just learn the way everyone else does? Why do you have to keep questioning things? You are making it hard for everyone else in class to learn.) Nevertheless my stubbornness again came into play; I continued to ask, and seek, the simple questions. They remain all around us, in clear view, but our training interferes with our seeing them. Even after all these years, I am still amazed at my failure to recognize the simple questions that surround me. (It took me ten years to ask the question: "If there are estrogenic plants, are there androgenic ones?" The answer led to a tremendous innovation in plant medicines for male reproductive problems.)

The thing about simple questions is that you never know where they will lead. Lynn Margulis, by asking about the function of the second nucleus in the cell (contained in the mitochondria) and by her refusal to stop asking, significantly undermined the foundations of reductionist Darwinism. Her work is, in my opinion, as seminal as that of Einstein and Lovelock, foundationally important to understanding ourselves and our world.

James Lovelock's perception that oxygen is a highly reactive gas that should not remain at high levels in the atmosphere is also a simple observation that stimulates an immediate simple question. People had long known that oxygen was highly reactive, that it should combine with other molecules, moving into a less reactive state, but he stubbornly continued to ask, "What is keeping the oxygen content so high on this planet?" As Isaac

Asimov once put it, the greatest developments in science come not from "Eureka!" but "Huh, that's funny, I wonder. . ."
The simple questions that have concerned me in my life and work, I feel, are not so foundational as theirs, nevertheless, there was something about them that would not let me go. In consequence all my life and work has been shaped by them.
Some of the questions that have captured my attention over the past 40 years are: Is Descartes dictum *Cogito Ergo Sum* actually accurate? What is the function of feeling? What is the function of emotion? What are emotions? What are human beings? What is the ecological function of the human species? What is the impact of hops in beer on male functioning? Since neurognostics (hallucinogenic plants) predate the emergence of the human species for by over 100 million years, what have they been doing all that time? What happens to pharmaceuticals that are excreted into wastewater streams by people? Do they still have impacts? What is occurring during moments of awe in natural landscapes? What does it mean when a person holds their body that way? How about that way? What gives rise to that expression on a person's face? How about that expression? If reductionist scientists are rational, why do they become so emotional when encountering a belief that is in opposition to their own?
A question that is currently taking up more of my time is this one: The genetic bits that come down to us from our ancestors and that are encoded in our genomes shape our physiology; they are parts of our ancestors that emerge within us acting as determinants of eye colour and hair colour (for instance). They hold, contain, a certain kind of memory. What if that memory is not limited to physiology? What if they actually contain memories? What if experiential gestalts of portions of the life experiences of our ancestors are also held in the genome within us? What if they emerge into our conscious experience from time to time? Is that the source of past life experiences? Is that the source of unexplained phobias? Can we consciously tap into those memories? What are the limits of doing so? Since genetic fragments are in fact self-organized biological organisms as are our livers and lungs, they are inherently intelligent. Can we consciously interact with them, accessing the memories of our ancestors who passed them into us? (Comment: It turns out that the offspring of mice who have been trained to fear certain experiences are born with an innate fear of those same experiences. Acquired characteristics can be passed on, distressingly Lamarckian. But further, there are memories held within the genome.)
Every one of these questions has led to depth insights about the world. For instance, hops have long been unquestioningly understood to be fundamental to beer and ale. In fact in two countries, England and Germany, it is illegal to make beer without hops. But, for example, no one was asking what the hops were doing to the people drinking it. It turns out that hops are the most potent estrogenic plant on the planet. Men who drink a lot of beer are actually taking hormone replacement therapy for women. It is a major cause of sexual dysfunction in men.
Pharmaceuticals excreted into wastewater streams were considered to be irrelevant because they remained in drinking water at only parts per trillion and parts per billion. However it turns out that they are most effective at altering life form physiology at parts per trillion, per billion, and per million.
The questions that no one else thinks to ask, the really simple ones, are the most important for they always affect something foundational. Because they remain unexamined the reality that underlies them affects everything we do, but we remain ignorant of it. Such questions reveal unexamined software that governs behaviour. Asking such questions, I have found, is essential to holistic science.

Peculiarities of Mind

I don't learn well when I have to do an hour on English, then an hour on mathematics, then an hour on history. It never has matched my learning processes. So, as my life progressed I began to structure it so that I could learn in the way that is natural to me. (This included finding educational structures that would allow this and ultimately creating a life where it occurred as a matter of course.) Specifically: when I find

something interesting and turn my attention to it, that is all I spend my time on. I completely immerse myself in it, often for years at a time. I don't tend to break up my study by spending segmented time on it, then moving on to something else, as people normally do in traditional school settings. During such long term focusing, aspects of the phenomenon being contemplated begin to emerge that cannot be found otherwise. The material begins to weave itself into who I am at the deepest levels of my being. I begin to know the thing itself from inside itself. In every instance where I have done this, the material itself comes alive in my experience. I know it as a living being, and it has not mattered whether it was working with wood as a craftsman or working with mathematics or working with plants in the wildness of the world.

Secondly, I have found that traditional academic boundaries are, well, to not put too fine a point on it, so inaccurate to the nature of the world as to be foolish to the point of insanity. As I continued to approach learning in this way, I found that the abandonment of academic boundaries freed up my capacity to learn and understand what had captured my interest. Further, this abandonment of academic classifications actually fit how my mind naturally worked when I immersed myself in a phenomenon that had captured my interest. It allowed me to naturally follow my studies wherever they led.

Slowly, into my awareness, emerges a gestalt of understanding of the complexity of the ecosystem as a living entity, an entity that is operating on multiple levels of complexity, an entity that cannot be understood when remaining within disciplined boundaries. My immersion takes me into epidemiology, soil remediation, plant communication, zoopharmacology, ethnobotany, allelopathy (in its true definition), pharmaceutical and industrial pollution dynamics, pharmacognosy, ecosystem topology, plant movements in ecosystems, the impact of discipline boundaries on ecological understanding, consciousness studies (via plant neural network functioning in ecosystems), the psychological orientation of various groups of people, and so on. I find that all these

disciplines are connected, that the complex phenomenon I am exploring cannot be limited to one point of view, that supposedly separate things are in fact closely connected to each other. For me, there are no discipline boundaries, holistic understanding precludes it. This inability to stop at discipline boundary lines has always seemed inherent in my mental orientation.

Thirdly, there is the way that I approach what I study, for example, how I approached mathematics. For several years I wanted to be a theoretical mathematician (applied mathematics I considered to be a rather appalling misuse of the craft).

For me numbers are not static concepts but real living entities that have identity, personality, and behaviour. The number 2, for me, is only a map, an indicator pointing to an identity that has real existence but no form. Numbers, through formulae, interact with each other. They behave. For me, reading a mathematics text was similar to reading a novel. And in fact, I did read math texts similarly, usually within a few days of the class beginning, I had read them through. I loved it. For me, the acute sensitivity to the difference between surface and essence was in play here as well. I was working with a particular kind of meaning that existed in a unique world; I was

not working with numbers or mathematics. That is just what people called them.
This movement, to see a thing from inside itself, to understand it as a living entity seems to be a natural peculiarity of mind for me. I don't see a plant but rather a complex, condensed node of being that takes on specific shape and behaviour in response to communications that flow through the environment. It literally is a transformation of messages but it is not static. It is rather a living expression of a certain meaning gestalt that alters itself from moment to moment in response to communications that flow into it from its environment. I see it as a living being, with interiority, with the ability to reason, choose, and the capacity for interaction with other life forms. I see the entire world this way; I don't know why. It is just a peculiarity of mind. But it naturally takes me out of a reductionist framework and into something holistic. I always had this peculiarity of mind but it had been suppressed by years of schooling. As I allowed myself to follow explorations of the natural world outside of academic boundaries, the capacity naturally emerged more fully. I believe that this is a natural expression within all children, to see the world as alive and interactive. The most peculiar thing might be my decision to allow it to re-emerge in adulthood as a primary perceptual frame.

And finally, an eccentric decision. Contemporaneously with my studies in mathematics I happened to read *The Limits to Growth* by *the Club of Rome*. This caused me to seriously examine my choices about mathematics (and reductionist science in general).

Briefly, I realized that the only two career choices open to me should I pursue becoming a theoretical mathematician would be to work for the government (probably within the military) or in university (which would be pretty much the same thing). And so, consciously, I turned my self toward the incredibly messy entanglement we call the world. I decided to find out for myself what was there. I decided that whatever work I did, it had to be something that could not be subsumed into the existing paradigm, something that could not be co-opted by corporations or government or the military. I walked away from that reductionist world and began to follow my feeling sense wherever it led me. My life, of course, immediately became very difficult, for there was no established cultural niche, no profession open to my habitation. And the vast majority of people I encountered had no real understanding of what I was doing or why. Economically, professionally, personally, culturally, it was very difficult. But the work that was within me did eventually emerge, slowly one step at a time. And the result of making that choice is that my life has become tremendously fulfilling; I did what was within me to do, from the root of my being. In consequence, the past 45 years has been one miracle after another.

Stephen Harrod Buhner *is an Earth poet and the award-winning author of twenty books on nature, indigenous cultures, the environment, and herbal medicine. He comes from a long line of healers. The greatest influence on his work, however, has been his great-grandfather C.G. Harrod who primarily used botanical medicines, also in rural Indiana, when he began his work as a physician in 1911. Stephen is a tireless advocate for the reincorporation of the exploratory artist, independent scholar, amateur naturalist, and citizen scientist in American society - especially as a counterweight to the influence of corporate science and technology.*

http://www.gaianstudies.org/Stephen.html

QUANTUM WHOLENESS, THOUGHT AND PERCEPTION

COLIN FOSTER

The day I finished my schooling I said to a friend, 'That wasn't an education that was an accumulation'. I felt at 18, that something vital was amiss in how society and culture were looking at life, and my education had been a reflection of that. So began a tortuous journey with the usual dead ends and "car crashes".

If it's the travelling that matters not the arriving, an important point in my endless journey to make sense of my 37 years of life came in 1983 when I first encountered David Bohm. I had just started work as a physics teacher at Brockwood Park School where Bohm regularly visited to dialogue with the founder, J. Krishnamurti, and to talk to the school about his ideas on the processes of thought. My impression was one of a person who was unassuming and rather shy but one, who at the same time had a generosity of spirit and a humanity that came through when he talked about what deeply concerned him. As I got to know him better, I wondered also if, through his work in physics, his understanding of the limits of thought and knowledge had caused him to have a deep humility despite his achievements. Einstein considered him his intellectual heir, and the Dalai Lama greatly valued his talks with David Bohm. In my opinion, outside of physics, his best book is *Thought as a System*. But how did he come to focus on these thought processes from his well-known insights into wholeness based on his physics work?

For Bohm, quantum phenomena and relativity point to an "unbroken wholeness in flowing movement", and the equations of Quantum Mechanics point to a view of reality as a holistic movement (the holomovement) of enfolding and unfolding from the implicate (hidden) order to the explicate (perceivable) order. Niels Bohr had also spoken of this wholeness but this is usually ignored, and emphasis is given instead to Bohr's philosophical notion that the probabilities given by the equations are all that can be said about the quantum world and so these probabilities express the limits of knowledge. Bohm felt that although knowledge was inherently limited, this limit could be extended indefinitely, so the notion of wholeness implied by quantum phenomena could be articulated but not in any final way.

Bohm was working on his physics proposals right up to the last day of his life; the title of his last book *Undivided Universe*, written with Basil Hiley, indicates how wholeness was central to his thinking. That knowledge is always limited meant that seeking a theory of everything made no more sense to Bohm than seeking a final poem.

There are two or three aspects of wholeness that I have understood. The first is that for wholeness to have the depth of meaning, to be a significant concept, it follows that a main feature must be that it implies the unlimited. Though indeed quantum physics suggests wholeness, this wholeness cannot be limited to the quantum/atomic world. If it were so limited it would not have the unlimited feature wholeness must have by definition, so wholeness must reveal itself at all levels of reality not only the quantum, but also including the biological and the cosmic, amongst other levels, in a way that can't be reduced to a more fundamental level. For me, *Undivided Universe*, the name of Bohm's and Hiley's book, expresses this.

Bohm wrote an appendix to his book on relativity called *Physics and Perception* in which he related the findings of relativity—the observation that time dilates and length changes with high relative speed—to the way we develop our concepts of time and space as children. Bohm had noted Jean Piaget's observations and I particularly like the peek-a-boo example of the game that one plays with the very young. The suggestion is that the concept of "object permanence" (that something continues to exist after it has gone from immediate sight) has not yet developed in the child, so when something disappears and then reappears unchanged, for the child it is a

pleasant surprise. In such a manner we build up our notions of a fixed space in which unchanging things exist in a separate absolute time whether we behold them or not. But we lose sight of this kind of development of concepts of space and time and forget that they are only “relatively invariant” concepts. If we were to remember this, we would not be so surprised when they no longer hold in new domains of experience such as the very high speeds of the theory of relativity.
I found Bohm’s ability to relate the findings of physics to everyday experience and perception extremely helpful in clarifying my own sense that scientific perception is not essentially different from everyday perception. An important example of this similarity in perceptions is the notion that science is about collecting truths about nature or about getting closer to truths with new developments. There is no evidence for this view; indeed the history of science suggests otherwise. Despite this, some scientists still insist on talking about the possibility of a final theory of everything. The word theory, it should be remembered, is related to theatre and has the meaning of "to view". Bohm preferred the word proposal to theory. This is not just an issue for scientists but also for everyday processes of thought in which ideas and views about the world tend to become confused with a sense of truth about the world, the map with the territory, and so become too fixed and not open to evidence of what is new and different. Bohm used the collective term non-negotiable assumptions to express what this leads to. My experience is that this is a key factor at work when communication breaks down and people get disturbed, and defensive, when talking about important issues of life.

In dialogues at Brockwood, Bohm often pointed out that the use of words like all, always, everywhere and never, indicated ideas that had become too fixed because they were associated with a sense of totality. He gave *Deutschland über Alles* as an example of this, with its obvious disastrous consequences. Following on from this, it seems to me that wholeness must point to a movement beyond space and time and beyond what thought can grasp. Bohm saw that thought incoherently tries to grasp the unlimited, and he felt that for thought to come to its proper place there had to be a sense of, or insight into, the unlimited. This is why I believe he looked at thought and its processes, because without an uncovering and exploration of thought, the conditioned habits of thought will interfere beyond their proper place and cause problems in communication and relationships. With wholeness in particular, it could reduce it and turn it into another limited “thing”; or there might be a reaction against reductionism to create holism, thereby missing the subtle relationship between the whole and the part that Bohm discussed. I have found judgments, expectations and unexplored assumptions to be products of thought that are hindrances to any new way of thinking. This is key to what I learnt from Bohm and his work: that a healthy openness and courage, yes courage, is needed so that one can see the inevitable limitations and perhaps inadequacies, of one's deeply-rooted assumptions not just about science but about the whole movement of life.

I have also understood that quantum phenomena point to a new paradigm for physical reality, as these phenomena cannot be understood in the present paradigm; wholeness being the key indicator of the new, more coherent, view. Thomas Kuhn showed that there are no stepping-stones from an existing paradigm to a new one. The present paradigm in physics includes a view of physical reality as being reducible to the mechanical movement of particles in fields in a separate empty space. This is the paradigm implied in the way science is taught in schools and taken for granted by most scientists. It is almost 100 years out of date, but even Richard Feynman, for whom I have deep respect as an inspiring physicist, said that nature could only be understood through mathematics, implying a new paradigm is not necessary. For him, a new paradigm would be of interest only in an after-dinner conversation.
Professional physicists have had an overly negative response to Bohm’s work. Bohm welcomed criticism, but much of the criticism of him and his work has been ill-informed. The

physics community is as vulnerable to prejudice, jealousy and ambition as any other group, with a tendency to conservatism from the older members. It seems the younger generation of physicists are more open to Bohm's work, as his and Basil Hiley's quantum interpretation is still “on the table” with other interpretations that are now being considered. The tenacity of the present paradigm should not be underestimated because it operates unconsciously in our thinking and language. I have found in discussions with colleagues that the Cartesian subject/object division is as persistent as the past/present/future illusion that Einstein noted. It seems that without a clear new paradigm we have no choice but to communicate in terms of the present outdated one. Bohm implied that to see the limitations of the present paradigm and the divisive processes that support it, one needs to make a phenomenological move and pay close attention to the original phenomena, psychological and physical, without letting preconceptions interfere; and to look without judgment at what the phenomena tell one. Seeing the significance of this move is already participating in a new paradigm, a new way of thinking coming from understanding that it is how one looks that matters not so much what one looks at. This is what Bohm suggested we do with thoughts and "felts" (feelings held in memory, in the same way thoughts are "thinkings" held in memory). The new paradigm has to take account of actual lived experience in a way that the present one does not do and probably cannot do.

To bring this concretely into education is the challenge for me as a teacher. The starting point is to take wholeness not as an idea to aspire to but as what actually is. The issue then is that our cultural conditioning is divisive and fragmentary and denies wholeness, this conditioning goes very deep and is organized around our, out- of-date, worldview or paradigm as I have said above. My proposal is that to approach wholeness directly will not work as it will be assimilated into the “old” worldview and will not mean very much, so the intention of my course is to expose and examine the conditioning of this worldview and so bring to light its limitations.

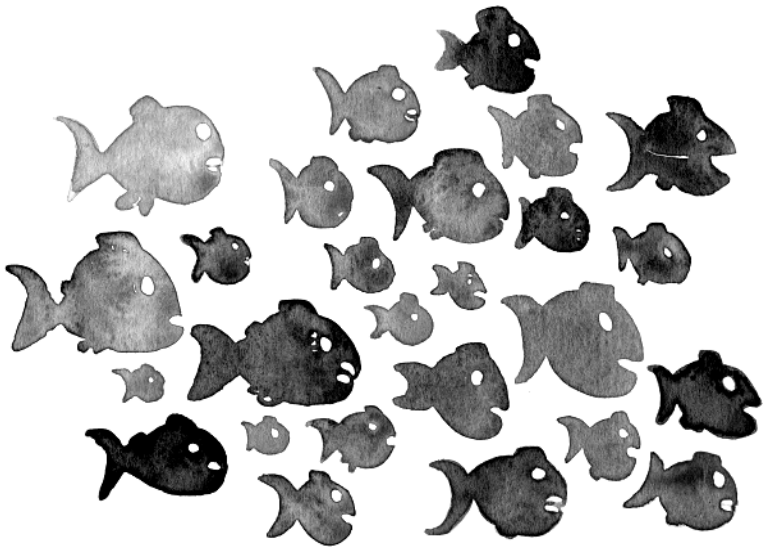
My course at Brockwood with 17 and 18 year olds is a wide ranging series of activities that expose and examine the conditioned nature of how we see and think about the world. It is necessary to carefully choose those activities that expose conditioning, as normally it is transparent, which means, like my glasses, it shapes my perception and thinking but can’t be seen directly. During the activities it is a challenge to meet the intention but when students put in the engagement they find it intriguing and seem to sense that they are learning something worthwhile about conditioning. One example of an activity is to take a recent emotive issue or event in their lives and focus on how they are thinking about it and expose such things as any unexamined assumptions and what is taken for granted as obvious. Another activity of a different kind is to show how our perception is organized by what we know, habits and expectations using optical illusions and the drawings of Escher. The difference between now and the day I left school is that now I understand that the way I see the world is conditioned by an out-of–date paradigm. When the depth of this conditioning is seen for what it is, and so is quiet, then wholeness can come through and be experienced in the moment through such activities as looking, watching, seeing and listening. These seemingly simple activities then take on a new significance as ways to be open to the wholeness which is always there.

“The field of the finite is all that we can see, hear, touch, remember, and describe. This field is basically that which is manifest, or tangible. The essential quality of the infinite, by contrast, is its subtlety, its intangibility. This quality is conveyed in the word spirit, whose root meaning is “wind, or breath”. This suggests an invisible but pervasive energy, to which the manifest world of the finite responds. This energy, or spirit, infuses all living beings, and without it any organism must fall apart into its constituent elements. That which is truly alive in the living being is this energy of spirit, and this is never born and never dies”.

Colin Foster *has been at Brockwood Park School for 30 years as teacher and co-principal.* His interest is in the philosophy of science and he currently teaches a course on science, perception and thinking.

FRITS AHLEFELDT, from Copenhagen, Denmark is the featured watercolour artist in this issue.

"I develop ideas, concepts and open projects about thrive, the environment, sustainable living, climate change, ecology, technology and the challenges and trails ahead of us… I work as an idea-brainstormer, visual storyteller and open innovation freak. I do most of my work with thousand year old drawing techniques and timeless tools like brushes, ink, paper and watercolour that I can use both getting ideas indoors and out on the trails.



(Fish swimming together in a shoal)

I've been into hiking since 1987, and have since worked to combine a way to hike, sketch and help to design better ways of relating to nature. The longest trip I've done is the 3,5 month hiking and research trek, through France and Spain, sketching watercolours and taking notes, learning about the different types of dwellings and communities that support the ancient pilgrimage-trail, the Camino to Santiago de Compostela, to get inspiration and new ideas for sustainable community dwellings. The last 10 years I've continued to focus on how we, our trails and places connect and interact, through storytelling, innovation and social activities, and how this can be supported by using digital technology and media.

What I have found is that the way we connect to the landscapes and to each other somehow works after very ancient hardwired patterns, and now the digital technology finds new ways to support and evolve these patterns. And I think maybe this knowledge can help us understand how to get ideas for design and build better and more sustainable societies, communities and relationships… both with each other and with the planet.

I work from a green vision to empower both cities and citizens to find ways to make us all thrive better and to, at the same time, get closer to finding more sustainable ways of living together.
When drawing up ideas I use both words and research existing knowledge and concepts, while juggling with classic old-school design sketching techniques, pencils and watercolours. Often I also use ink and metaphors to illustrate the understandings, feelings, roles and challenges ahead – and when possible even to sketch directions, that can get us moving along better trails."

http://hikingartist.com/

THE ALLEGORY OF THE ALGORITHM

JAMIE PERRELET

Since the unification of matter and energy, space and time, an information description of reality has been progressively emerging within the heart of physics. Algorithmic information theory (AIT) has significant implications for modern cosmology and quantum theory, placing tight constraints on certain physical processes. The determinism implied by AIT appears to prohibit notions of freewill altogether. Yet humanity has irrefutably demonstrated the ability to transcend such boundaries. The stochastic process of quantum indeterminism appears to play an important role in substantiating the existence of creativity in a deterministic universe. An information theory approach to this enquiry clearly suggests the need for physics, biology and the science as a whole to supersede the mechanistic paradigm.

The Nature of Information

Information was first quantified in 1948 by Claude E Shannon's landmark publication, 'A Mathematical Theory of Communication'. Shannon's definition of information is remarkably straightforward, however its implications continue to shake the foundations of science; indeed it has been described as 'the most basic law in physics'.

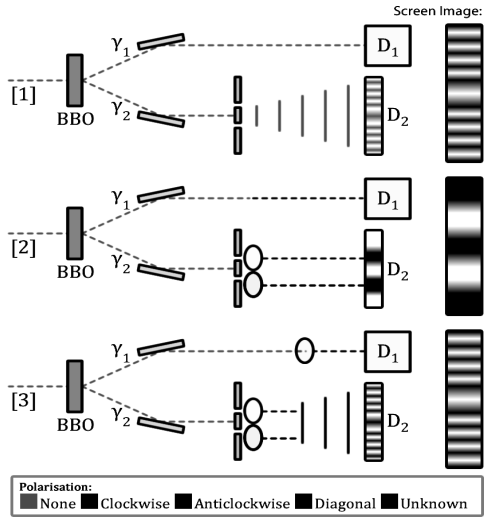
"Regard the physical world as made of information, with energy and matter as incidentals."- John A. Wheeler

Shannon realised that information is simply 'that which can distinguish one thing from another' and defined a single unit of information as the quantity of information required to decide between two possibilities. He named this quantity of information, 'entropy', for its many parallels with thermodynamic entropy and the unit of information a 'bit', short for binary digit. Hence, a binary choice such as the flip of a coin has 1 bit of entropy and the four possibilities of two coin flips has 2 bits of entropy. Information is a measure of unpredictability; the greater the number of possible outcomes of system, the higher the entropy.

Although this formalism is sourced in communications theory, there is growing evidence from both the perspectives of quantum and cosmological physics that information is a fundamental and potentially elementary construct of reality. The nature of information is best illustrated through the outcome of physical experiments.

Quantum Entanglement

A pair of particles can be prepared in such a way that their properties become 'entangled' and the behaviour of the two particles is entirely inseparable. To exemplify, if the spin of an entangled particle is measured to be clockwise, its partner will immediately assume an anticlockwise spin, despite the fact that neither particle had a defined spin before the measurement was taken. Astonishingly, the phenomenon happens instantaneously over arbitrarily large distances. The experimental confirmation of entanglement marked a defining moment in the history of physics.



Within the framework of relativity faster than light events suggest a reversal of causality; implying an effect preceding its cause. Pairs of entangled particles have been used in various experiments to reveal insights into the

fundamental nature of reality. Entanglement is investigated further in the following three stage setup, called the 'quantum eraser' experiment.
Stage 1: A photon passes through a beta barium borate (BBO) crystal, converting the single photon into a pair of entangled photons (γ1& γ2). The two photons follow separate paths; γ1 is sent straight to a detector (D1) and γ2 to a double slits setup with a target screen and detector (D2). Both detectors are connected to a coincidence circuit, ensuring that only the entangled photons are recorded. Scanning horizontally, D2 records an intensity map of the screen, revealing the infamous interference pattern of double slit experiments (see *Sabbadini* article Pg 17 in this issue). The recorded interference pattern implies that the photons have effectively passed through both slits simultaneously; interacting with itself.

Stage 2: A circular polariser is placed in front of each slit, giving γ2 either a clockwise or anticlockwise polarisation, depending on which slit it has passed through. The polarisers have the effect of 'marking' γ2, as it is now possible to know which slit it has passed through by measuring the photon's polarisation. The consequence of this is that the 'which-path' or 'which-slit' information associated with γ2 is known and the interference pattern seen at the screen is destroyed as result. As with a normal double slit experiment, the act of observation has caused the photon to pass through a single, well defined, slit.

Stage 3: A third polariser is placed on the path of γ1, imparting the photon with a diagonal polarisation before being recorded at D1. Since γ1 and γ2 are entangled photons, their polarisations are instantaneously effected by one another. The circular polarisers at the slits are affected by the diagonal polarisation of γ1 and they now randomly produce a mix of clockwise and anticlockwise polarisation, regardless of which slit γ2 has passed through. The 'which-path' information has now been 'erased' as it is not possible to know which slit γ2 has passed through and the interference pattern on the screen reappears. Astonishingly, this effect is independent of whether 'erasure' happens before or after γ2 has passed through the slits and can even be achieved after γ2 has been recorded at D2!
A related experiment, called the delayed-choice quantum eraser, allows the decision as to whether to keep or erase the which-path information until after its entangled partner has been detected. The extraordinary consequence is that an event that has already happened can be caused by an event which is yet to take place at some arbitrarily time in the future. We have become accustomed to the mind-bending trademark of quantum phenomena, however in these experiments, our basic understanding of a causal sequence of events comes into question.

"This isn't right. It's not even wrong."
Wolfgang Pauli

In order to reconcile entanglement and the above experiments with physical causality, it is necessary to take an information perspective on the arrangements. For example, if a code were assigned to the spin direction of entangled particles (e.g clockwise = 1 & anticlockwise = 0), it would be reasonable to presume that the phenomena could be used for faster than light communication. However on closer examination, it is apparent that whilst a measurement will reveal the state of a distant particle instantaneously, due to quantum indeterminacy, there is no way of knowing which spin direction the particle will actually take prior to the measurement. Therefore, in order to successfully communicate a message, a secondary signal is required to 'unlock' the information encoded within the states of the entangled particles. Being classical, the secondary signal must be bound by the speed of light; so whilst it is possible to observe a distant system instantaneously, no information may travel to it faster than light.

In the case of the quantum eraser experiment, the possible trajectories of a photon are defined by whether or not certain information has been recorded. The experiment illustrates how the which-path information may be erased after it has been recorded, returning

the system to its original state. The delayed-choice quantum eraser, further highlights the behaviour of information. In this experiment, the choice to either keep or erase the which-path information occurs after the photon has been measured and thus there is a suggestion of retro-causality. This outcome is curiously circumvented, as whilst the measurements are well defined, the path of the photon can only be deciphered retroactively. The which-path information is attained by comparing data from all the detectors in the setup and so once again a classical signal is required to transmit information between the detectors, which is bound by the speed of light.

These experiments reveal the curious fact that the physical properties of distant quantum objects can indeed be affected non-locally. Despite this, causality and relativity still hold because any meaningful information contained within the entangled system is, at best, unlocked at the speed of light. The subluminal boundary of information suggests a close connection between it, mass and energy. Such a relationship between information and energy has been confirmed experimentally with Szilard's engine that demonstrates how a particle is able to do work by receiving information, rather than energy.

"It is important to realize that in physics today, we have no knowledge what energy is."
-Richard Feynman

Algorithmic Information Theory
Born out of the 1960's, algorithmic Information Theory (AIT) expands upon the work of information theory, by applying Shannon's theories of information to step-by-step calculating procedures. AIT defines the amount of information in a data set as its length after maximal lossless compression, known as the Kolmogorov complexity. Put otherwise, it is the minimum length of a computer program or algorithm that can reproduce a message without losing any information in the process.

10101010101010101010101010101010
10010111011000101011000011010101

Consider the above example; they are both strings containing 32 characters of 0's and 1's. The first string is said to be compressible as it can be rewritten as '16 10s', whereas there is presumably no other way of rewriting the second string more concisely. According to AIT, the first string contains less information than the second, because it is compressible into a shorter description.

11.00100100001111110110101010001000

The above string isn't obviously compressible, however it is actually the first 32 digits of π written in binary. A short computer algorithm can be easily written that is capable of producing an indefinite number of such digits. For this reason, it would be possible to efficiently compress a large number of digits of π by writing them more succinctly as an algorithm based on Leibniz's formula:

$$\pi = 4\left(1 - \frac{1}{3} + \frac{1}{5} - \frac{1}{7} + \cdots\right)$$

Algorithms are a step-by step series of procedures that will always generate exactly the same output for a specific input. If the output of an algorithm is longer than the length of the algorithm that created it, then the output can, by definition, be compressed by rewriting it more concisely as the algorithm itself. Thus, programs are actually unable to create new information, as the information within an output is already contained within the algorithm itself. An algorithm effectively rewrites the information it already contains into a new form.
These inherent limitations on computation are not well popularised, however they have considerable implications for mathematics, physics and philosophy. All mathematical operations can be written algorithmically and are thus bound by the same restriction. It is not possible to produce more information from an equation than is already contained within its definition. All of mathematics is achieved within a sandbox of carefully defined axioms, otherwise known as the elementary postulates or assumptions. The axioms of mathematics stand alone as the foundations for all

mathematical knowledge. By definition, the axioms of mathematics cannot be derived from one another and hence they are ultimately uncompressible from the perspective of AIT. A mathematical theorem is said to be proven when it can be consistently traced back to the fundamental axioms of mathematics and therefore all of mathematics is derivable from its axioms. Just as a computer algorithm cannot create new information, equally the theorems of mathematics cannot create new axioms. Therefore, the vast ocean of information held within mathematics is fully contained within its axioms.

Algorithms and Freewill

Theoretically, every past and future state of a purely deterministic universe can be calculated from its present state and hence the total information in such a universe would be constant. Freewill, the ability to choose, is a diversion from determinism and is therefore the antithesis of the algorithm. Through the ages, scientific discoveries have largely eroded the possibility of freewill in favour of a fixed causal description of reality. From an information theory perspective, an act of free will must either involve the creation of new information or the transformation of information in a non-algorithmic manner. Hence, AIT appears to terminate freewill altogether, it forbids the creation of information by any process that can be accurately modelled by mathematics. Within the discipline of mathematics, the creation of new information would be indicated by the creation of a proposition that cannot be derived from the axioms of mathematics, namely a new axiom. Remarkably, this is exactly what humans have achieved in discovering the axioms of mathematics. It is exactly the thing that no algorithm will ever be capable of and henceforth human consciousness has the ability to transcend computation.

"All theory is against the freedom of the will; all experience for it."- Samuel Johnson

The Arrow of Time

Is it possible to reconcile the inherent freedom of the human mind with the known laws of physics? Freewill is a discussion of creativity, or how things come into being and as such it is helpful to look at our current understanding of time. There are only two known physical processes that are not completely time-symmetric; the second law of thermodynamics and wave function collapse. These irreversible processes are considered to be the source of the 'arrow of time', the reason that events viewed forwards and backwards in time are so distinctly different.

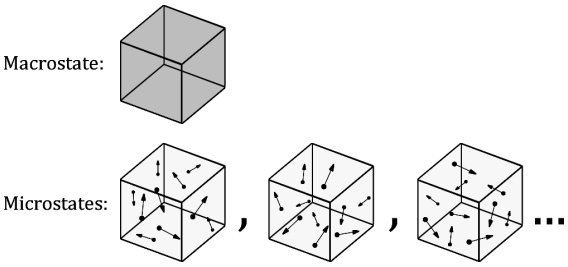
The second law of thermodynamics describes another quantity called entropy that was defined before Shannon's. Thermodynamic or physical entropy, is the amount of disorder in a system, rather than unpredictability. Thermodynamic entropy may be seen as a measure of the number of ways the particles of a system can be arranged, without changing the large-scale properties of the system. The second law states that the total thermodynamic entropy of a closed system is always increasing towards its maximum value, which corresponds to thermodynamic equilibrium. Whilst the second law does allow entropy or disorder to decrease locally, this reduction is always at the expense of some larger increase of entropy, normally in the form of heat, elsewhere in the system. The second law is statistical rather than fundamental, maintaining that there are a higher number of less organised, higher entropy, states available to the evolution of a system than more organised, lower entropy, states. For example, imagine an egg shattering on the floor; it isn't impossible for the egg to repair itself, it's just extremely unlikely as there are many more broken-egg states, than fixed-egg states. Thermodynamic entropy (S) and Shannon's information entropy (H) should not be confused, however there are many parallels between them, as seen in the similarities between there definitions:

$$S = -k_B \sum_i p_i \log p_i$$

$$H = -\sum_i p_i \log p_i$$

The first equation is the Gibbs formula for entropy, where kB is Boltzmann's constant and p_i is the probability of a particular state of the

system. The second equation is Shannon's equation for information entropy, where p_i is the probability of a certain information string occurring. Thermodynamics is not concerned with the individual positions and velocities of particles (microstates), rather it seeks to describe a system's macroscopic properties, such as temperature and pressure.
Macroscopic variables are derived by averaging over all the possible microstates that describe the same macroscopic system (macrostate), making it dramatically more manageable to perform useful calculations. The thermodynamic entropy (S) is simply the amount of Shannon information needed to describe the detailed microstates of a system that cannot be inferred from macroscopic variables.



The universe is believed to have been born out of an extremely hot and dense event, where all energy and matter were condensed at a single point. Although, the known laws of physics cannot describe such a singularity, much insight has been gained regarding the moments immediately preceding it. The second law of thermodynamics actually references the state of primordial creation The irreversible arrow of time outlined by the second law, requires the assumption that the entropy of the early universe must have been much lower. Consequently, the persistence of entropy increase described by the second law, is ultimately nothing more than a boundary condition designating the initial conditions of the universe to be low entropy and well-ordered.
This reflection is in agreement with cosmological observations of an expanding universe. As the universe expands, the number of degrees of freedom increases and so the total number of possible microstates of the universe increases. Since thermodynamic entropy is a measure of the number of microstates that describe a particular macrostate, the maximum entropy of the universe is steadily increasing with expansion. The singularity represents the minimum possible degrees of freedom and it is therefore clear that the maximum entropy of the universe was diminishingly small towards the Big Bang. Further, as Shannon entropy is defined as the amount of bits required to distinguish between all possibilities, the limited freedom at the Big Bang implies an extremely low information content.
There exists an upper bound on the maximum entropy or information a spherical volume can theoretically contain, called the Bekenstein bound. The limit is derived by considering the maximum entropy density an object can have without violating the second law, if it were dropped into a black hole.

$$S \leq \frac{2\pi k_B R E}{\hbar c}$$

$$H \leq \frac{2\pi R E}{\hbar c \ln 2}$$

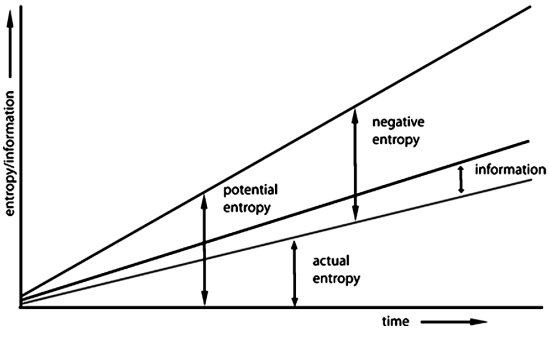
Where k_B is Boltzmann's constant, E is the total mass-energy, R is the radius of a sphere, ħ is the reduced Planck constant and c is the speed of light. Evidently, as the universe expands, the maximum possible thermodynamic entropy of the universe increases, however applying this line of reasoning to the evolution of physical information in the universe is not so straightforward. There is a strong insinuation from quantum theory that information is a conserved quantity and yet there is puzzling cosmological evidence to suggest otherwise. In quantum theory the sum of the probabilities of all possible events is considered to be exactly equal to 1; a cornerstone postulate known as unitarity. A fundamental implication of unitarity is that complete information about a physical system is encoded within its wave function, which implies that information is conserved. This result is counterintuitive in the reflection of an expanding universe and the Bekenstein bound, which suggest that the information storage capacity of the universe should be increasing with time. Furthermore, the 'black hole information paradox' only adds

to the conundrum; a truth seen reflected in the tension it has created within the physics community over the past decades (see Hawking, 2013).

"It is entirely possible that behind the perception of our senses, worlds are hidden of which we are unaware."- Albert Einstein

The apparent contradiction of information conservation is a direct expression of the greatest challenge facing physics to date; the fundamental incompatibility of quantum field theories and gravity. However, according to Roger Penrose, loss of unitarity in quantum systems is not actually a problem; Penrose claims that as soon as gravitation is included quantum systems do not evolve unitarily anyway.

Despite second law's stipulation to increase disorder, the universe is actually filled with an intricate web of organisation that appears to be at odds with entropy increase. A number of explanations have been proposed to explain the emergence of complex information structures and the mechanism behind the apparent decrease in entropy they are accompanied by Léon Brillouin described the phenomena as negentropy (negative entropy), a quantity that has been closely associated with Shannon information. The second law actual allows for entropy to decrease locally, provided the net evolution is a greater increase in entropy elsewhere in the system. Astrophysicist, David Layzer, has expanded this view, by illustrating the problem in terms of maximum entropy.



Unlike popular theories that lock space and time into a predetermined geometry, Layzer's model reflects a universe that is continually in the process of creating itself. According to Layzer, as the universe expands, its maximum entropy increases faster than the creation entropy. The result is a tug of war between the second law, which seeks to increase entropy and cosmological expansion, which increases the maximum possible entropy. This dynamic tension is regularly described in terms of the entropic force of gravity and expansion, which prevents the universe from falling directly into thermodynamic equilibrium. The difference between maximum entropy and the actual entropy (negative entropy) allows freedom for the creation of new information, without violation. The important question in the light of such theories is; where could all the new information be coming from? As has been shown by AIT, there is no algorithm or mathematical operation that is capable of creating new information and therefore, a physical process with such an ability would have to be inherently non-algorithmic. Is such a phenomena observed in physics?

Quantum Indeterminacy

A central premise to quantum theory is that the physical quantities of a particle or system, such as position, are undefined until they are measured or 'observed'. Prior to measurement, the particle is in simultaneous mixture of all theoretically possible configurations, known as a superposition of its states. The information of these possibilities are encoded as a mathematical entity called a wave function, which evolves deterministically like a classical wave. Upon measurement, the superposition of states is destroyed and the particle assumes a single state, an irreversible process known as wave function collapse. Whilst the wave function contains the relative probability of each potential state occurring, it says nothing about what state will actually be observed. In contrast to the deterministic evolution of the wave function, the collapse of the wave function is fundamentally non-deterministic as there is no way of knowing exactly what state will be measured. For example, if a particle is in a superposition of two equally probable states, it will randomly adopt one of these states each time it is measured. This situation corresponds to

maximum uncertainty and therefore maximum Shannon entropy. Many interpretations of quantum theory have been formalised with the intention of eliminating indeterminacy as a lack of knowledge, however these have failed in the light of Bell test experiments. Profoundly, there is an inherent amount of randomness at the heart of reality, which is in one way or another, choosing the state of the universe.
The production of random numbers is extremely important in the field of computer science for encryption, among other tasks. Given the deterministic nature of computation, random numbers generated by a computer program cannot, by definition, be truly random. Hence, algorithms that are capable of producing the appearance of random numbers are called pseudorandom number generators. PRNGs operate by adding layers of complexity to the algorithms input, known as its seed, however for a given seed the same output is always produced. Like the creation of a new axiom, the production of true randomness transcends computation.

"Anyone who considers arithmetical methods of producing random digits is, of course, in a state of sin."- John von Neumann

Whilst randomness is normally considered to be a lack of information, true randomness actually represents the maximum possible Shannon information. This is because Shannon entropy is a measure of unpredictability, which is maximal in the case of randomness. In AIT, Kolmogorov randomness is defined as being shorter than any program that can create it and is thus entirely uncompressible. A number of strict definitions have been given to randomness, however some issues remain in these formalisations. For example, there are various methods that can computationally test for randomness, however in reality, true randomness should be capable of producing all possibilities and therefore shouldn't be confined to a certain type of behaviour. Despite this, there are many characteristics of randomness that are well understood. The distribution of a sufficiently large sample of random numbers is expected to be normal or uniform, meaning that each number should roughly appear an equal number of times .Further, random numbers should not repeat themselves and therefore true randomness actually implies an infinite expansion of information. The enigmatic nature of randomness is seen reflected in the words of David Bohm, who described it as an "order of infinite degree" (Bohm, 1987)

The desire to explain reality in purely mechanical terms is inadequate in the light of the indeterministic process that underpins quantum phenomena. The generation of true randomness is of a nature beyond computation, posing a potential avenue for the creation of information in the universe. More broadly, regardless of whether or not information is a conserved quantity, the stochastic phenomena of wave function collapse represents the manipulation of quantum information in an entirely meta-algorithmic manor.
This is not new knowledge, quantum indeterminacy has been realised in physics for the best part of a century. However, due to our inability to get behind the phenomena of wave function collapse, the focus has been primarily on the mechanics of wave function evolution. In fact, much of the attention devoted to the study of indeterminacy has been to refute its very existence. Modern physics has become comfortable with indeterminacy by taking a probabilistic approach to quantum theory, brushing uncertainty under a carpet of statistics. Quantum experiments may be repeated an enormous number of times, revealing unprecedented degrees of correlation between theory and observation, making it the most validated theory in physics. From this perspective, the laws of large numbers take care of the uncertainty and drastically simplify the phenomena by making it mathematically manageable. The motivation is to observe how a system correlates to the statistical expectation for large sample sizes. Whilst this method is extremely powerful, it has the effect of blurring out the details of individual measurements. This is deemed acceptable as quantum decoherence is understood to prevent these variations from having an effect on the large scale properties

of the system. However, this is not a universally supported belief and Carl Popper, among others, have developed alternative 'propensity' theories of statistics that attempt to bring the individual event back into context. Unfortunately these theories have gathered little support from the mainstream, as they are inherently difficult to interpret.

Sensitivity and Indeterminism

In the limit that the number of particles in a system approaches infinity, the statistical averages of the system become the laws of classical physics. Hence, according to quantum decoherence, the dominance of statistical averages renders individual quantum measurements insignificant for large sample sizes. Therefore, despite the mysteries of indeterminacy, what possible effect can it have on macroscopic events? This question remains highly debated, however the field of dynamical systems may illuminate the enquiry.

Since the birth of the computer, it has been possible to analyse non-linear equations, which were otherwise unsolvable. Mathematicians quickly discovered that seemingly simple non-linear equations, can produce incredibly complex solutions, a property called deterministic chaos. Edward Lorenz, a pioneer of the chaos theory, summarised it concisely: "Chaos: When the present determines the future, but the approximate present does not approximately determine the future." Lorenz is referring to the premise that whilst chaotic systems are deterministic, the slightest alteration in initial conditions can have a tremendous consequence on the evolution of the system. Sensitivity to initial conditions is a hallmark characteristic of chaos, crystallised in the image of the butterfly effect.

From molecular interactions to stellar orbits, non-linear dynamics and chaotic behaviour is exceedingly common in the natural world. Just like the butterfly's wings and the tornado, chaos may act to amplify quantum indeterminacy into the macroscopic world. Over the past two decades a new discipline of physics has been emerging that unites dynamical systems and chaos into a single theory of quantum chaos. The founding question for quantum chaos is clear; what effect would classical chaos have on quantum mechanics? As it happens, chaos appears to be as common in the quantum world as it is in the classical. The well behaved hydrogen atom has long been revered by quantum physicists for its simplicity; a single electron orbits a single proton. Yet, the electron orbitals of a Hydrogen atom become chaotic in the presence of a simple magnetic field. Although the study of quantum chaos remains in its infancy, much insight has already unfolded. For example, the quantum equivalent of classically chaotic systems is actually non-chaotic and likewise, classically well-ordered systems become chaotic at the quantum level.

As it happens our universe is unfathomably sensitive to initial conditions, a fact best illustrated by Michael Berry's following thought experiment. Consider a box filled with oxygen gas and imagine that it is possible to trace the path of a single oxygen molecule as it moves around the container, colliding with other molecules billions of times a second. Next, the observation is repeated, only this time with a slight change to the initial conditions of the system; a single electron is placed at the edge of the visible universe. With the intention of minimising the disturbance, only gravity, the weakest of the fundamental forces, is to be considered. The electron is 1836 times lighter than a proton and has been positioned some 13.7 billion light years away and all the forces bar gravity have been ignored, equating to a minute force of approximately 10-118N. Berry asks how many collisions the oxygen molecule will need to experience before its direction is 90°away from its original path, had the electron not been added. Given this inconceivably small perturbation, it is difficult to imagine that the electron will have any effect, however in as little as 50 collisions the orientation of the oxygen molecule will have changed by 90°! (Berry, 1998)

"A physicist is just an atom's way of looking at itself."- Niels Bohr

Biological Implications

The above example reflects the remarkable interconnectedness of two microscopic systems separated over astronomical

distances; there truly are no isolated systems. However, in order for chaos to amplify indeterminacy, sensitivity needs to be expressed across magnitudes of scale, between quantum and classical worlds. The relationship between biological forms is an unmistakable example of this type of sensitivity. Biological life is extraordinary sensitivity to initial conditions; consider the effect that altering the genetic code can have on a developing embryo.

Since genetic mutation is a fundamental principle in our understanding of evolution, this should not come as a surprise. In the theory of evolution, new biological traits are the result of random mutations at the genetic level, however what exactly is meant by 'random'? As previously illustrated, true randomness represents a deeply metaphysical process that is intrinsically beyond the deterministic paradigm. Among the causes of random mutation is ionising radiation produced by radioactive decay; the spontaneous emission of energetic radiation from an unstable element. Radioactive decay is an inherently random process that is sourced in quantum indeterminism; it is not possible to know when a radioactive element will decay, only when it is statistically likely to do so. Similar reasoning can be applied to the other genetic modifications, which are essentially molecular interactions occurring within the domain of quantum indeterminism.

The implications are clear, the theory of evolution is fundamentally rooted in a principle that is not only beyond human understanding, but mathematics as a whole. Evidently, there is cause for further research regarding the alteration of genetic information and the creation of new biological traits in the light of AIT. The analogy of a deterministic machine is an unmistakably obstructive and misleading metaphor for evolution and the universe as a whole.

Synthesis

Contemporary physics has revealed an information description of reality that appears to be as significant to our understanding of the universe as the unification of energy and mass. The exploration of the quantum realm continues to unveil the deeply paradoxical nature of the universe, drawing into question basic notions of reality such as locality and causality. Simultaneously, information theory has taken the concept of freedom to the brink of impossibility, laying out a conservation law that forbids all of mathematics from creating new information. Yet, the very creation of mathematics totally invalidates any claim that humanity is bound by such a conservation law. Humans have achieved the one thing that the algorithmic computer will never be capable of; the creation of new axioms.

Information theory and thermodynamics appear to be inseparably connected and yet unitarity of quantum physics suggests that information is a conserved quantity. The paradox of information conservation continues to be highly debated, though there are profound philosophical implications regardless of whether or not conservation holds. Given the governance of the second law to perpetually increase disorder, the universe has woven itself into an exceptionally complex web of intricate structures. Much of this organisation can be accounted for as an emergent phenomenon, caused locally as the universe as a whole descends into thermodynamic equilibrium or 'heat death'. These deterministic explanations are however unable to illuminate the mystery of creativity, exemplified in humanities creation of mathematical axioms.

A description of reality that is inclusive of creativity must be expansive enough to encompass principles that are beyond the strict determinism of mathematics. Quantum physics is founded on intrinsically indeterministic phenomena. However the significance of this uncertainty has been disregarded in favour of statistical reasoning. Although many attempts have been made to reinstate physical determinism by reducing wave function collapse to a mere lack of understanding, these 'hidden variable' theories have all failed in the light of Bell tests. The quantum field appears to propagate as a field of potential deterministically, whilst simultaneously maintaining the freedom to evolve and define itself non-deterministically. The manipulation of the information held in quantum states

through the process of wave function collapse is not only beyond our understanding, but abilities of both mathematics and computation.

The sensitivity of chaotic systems offers a potential route for the amplification of quantum indeterminism to macroscopic states. Chaos is commonplace in quantum systems and the latest theories are maturing towards a new physics that unites quantum theory and dynamical systems. Whilst the implications of quantum chaos are not well understood, the relationship between genetics and biological organisation draws a clear example of sensitivity between the quantum and classical worlds. The theory of evolution is dependent on alteration of the genetic code by way of random mutations. However the theory does not encompass the mechanism behind this process. Random mutations can be caused in numerous ways, such as ionising radiation from radioactive decay, which is an innately indeterministic process. The impossibility of replicating true randomness algorithmically raises challenging questions with regard to causality; further, the very foundations of the evolution theory rest on metaphysical ground.

To close. Since the creative potential of the human mind to conjure the axioms of mathematics is the one macroscopic phenomena that irrefutably transcends determinism; wouldn't it therefore be more intuitive to perceive quantum indeterminism in relation to consciousness rather than matter?

"I regard consciousness as fundamental. I regard matter as derivative from consciousness. We cannot get behind consciousness. Everything that we talk about, everything that we regard as existing, postulates consciousness." -Max Planck

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Mettaphysicist & fractal artist, ***Jamie Perrelet*** *has devoted himself to analytically and intuitively studying the nature of reality. With a degree in Physics and a master's in Holistic Science, he has travelled across North America and the UK offering workshops on the frontier of physics & consciousness.*

http://mettamorphysics.com

Quantum Ripples

(original art by author)

"I FOUND THAT I'VE BEEN FREE ALL ALONG":

KNOWLEDGE, MEANING, CREATIVITY AND HOLISTIC SCIENCE

MIKE WRIDE

"And an eternal, living Activity
Works to create anew what has been created
Lest it entrench itself in rigidity.

It is intended to move, to act and create –
First to form and then to transform itself;
Its moments of immobility are only apparent."

Johann Wolfgang von Goethe (1749-1832)
In: Naydler (1996); p 113.

"My mind seems to have become a kind of machine for grinding general laws out of large collections of facts…If I had to live my life again I would have made a rule to read some poetry and listen to some music at least once every week… The loss of these tastes is a loss of happiness."

Charles Darwin (1809-1882)
In: Barlow (1993); pp 138-139.

Introduction

These quotes reflect two polarities: one sees the creative dynamism in nature (Goethe's), while the other (Darwin's) is an admirably honest, but somewhat belated and sad self-reflection, a recognition that when the mind becomes *"a machine for grinding out facts"*, we are in a very unhealthy situation indeed. This seems to me to be our current predicament, and it would appear that science, as both a reflection of and a driving force within society, is at the heart of it.

We are not helping students appreciate the creativity inherent in nature, as epitomised by Goethe's dynamic view. The doctrines of mechanism, reductionism and absolute objectivity are inculcated into science students at the expense of their creative self-expression and their ability to appreciate the sacredness of nature and the wholeness of phenomena. The malaise is reflected in declining enrolments, confusion and disengagement of science students (Schmidt, 2010), as well as lack of motivation, epitomised by reduced student attendance of classes (Massingham & Herrington, 2006). This is perhaps for good reason, since this is *"not a flight from rigour but from rigor mortis"* (McWilliam *et al.,* 2008). So, how can we re-invigorate science students, to enable them to appreciate the dynamism of nature, to see and feel the beauty and the poetry? What has happened to the artistic sensibility in science? Where is the mystery and the meaning? Where is the love of knowledge (Figure 1; (Zajonc, 2006))? We are asking fundamental questions about what is the domain of science and the very nature of the 'official' scientific method. Is it still there in individual scientists and students, but hidden perhaps in the collective scientific enterprise? How can we overcome *'rigor mortis'*?

My own feelings on these questions stem from my experience of twenty years of University teaching and a certain frustration with the *status quo*. We are still very focused on quantification and dumping knowledge, comprised of 'text-book facts', into science students, even though we know that there are no absolute 'facts' (Popper, 2002). Knowledge has been emphasised at the expense of meaning. Peter Medawar, biologist and philosopher of science, went as far as to say: *"A 'good' experiment is precisely that which spares us the exertion of thinking: the better it is, the less we have to worry about its interpretation, about what it 'really' means"* (Medawar, 1969), pp14-15.

So, qualities such as meaning and wisdom have been side-lined, denied or excluded, because curricula are focused so much on knowledge. It is very hard to get out of this way of thinking. How can we 're-create' science to creatively balance knowledge and meaning?

Learning from Nature

I am filled with a sense of awe and wonder when studying embryos. The gradual appearance of form of a zebrafish embryo is astounding. The cells move in an intricate

dance of creative exuberance, co-operating and responding with ease to the rhythms in the silent music, creating intricate, interweaving patterns that are beautiful to behold. We cannot appreciate the process of embryo development without 're-cognising' this inter-connectivity and these dynamic relationships. We see that there is *"multiplicity in the unity"* and that as cells differentiate to become the seeming different 'parts' of the embryo, they are indeed 'distinct' but not 'separate'. The potential for development, the archetype of the whole organism, is in the fertilized egg from the very beginning, just as the potential for learning and realising new meaning is immanent in the student. We can learn from the embryo.

The Metamorphosis of Meaning

Recently, on the MSc Holistic Science complexity module, along with Philip Franses and James Wakefield of Exeter University, we explored the emergence of meaning, as the potentials within the fertilized egg are expressed during development. At the same time, the students undertook their own metamorphosis of meaning. They were encouraged to reflect on their journey during the process, to feel their way, and to relate this to the dynamic changes occurring in the embryo: cell migration, proliferation, differentiating and death.

'Re-Creating' Science

Schumacher College's educational approach is transformative, participative, meaningful, playful and creative, particularly regarding the ability to develop the ability to see the wholeness and dynamism of nature through Goethe's way of science (Bortoft, 1996; 2012). During the research for my MEd Dissertation (Wride, 2014), I carried out interviews with Schumacher teaching staff and MSc Holistic Science students to explore their personal experience of the Schumacher educational approach. The views of one student 'Sally' are presented here as a testimony to her personal transformation during her MSc Holistic Science 'pilgrimage' and her thoughts and fears about working with her experiences upon leaving Schumacher.

"Alive in a Dead World"

'Sally' reflected on the deadening effect of the science education she had experienced as a child:

"I love physics, but I didn't like the way it was taught. Biology….I just felt I wanted to ask different questions and the questions I was asking weren't welcomed with open arms….. So, I just thought I was no good at science, so I put it to one side …. I drink anything that I can put into context in my life and my experience, because to me then the whole world comes alive.....I was learning about a dead world….. What's alive for me, what's dead for me? I think my whole life everything around me has been dead because I've not been able to access or have my creative side fed. So, I'm alive in a dead world."

"Saying the same words, but people don't see what it is you're saying"

'Sally' also reflected on how important language is in creating the world and the limitations of communication in finding shared meaning. Such reflections have profound importance for a creative education in enabling space and open-ness, versus closing down and fixing the student-teacher relationship. Both the choice of words and allowing space for silence and reflection are vital:

"If you're going around thinking that you've got to 'tackle' something or 'surrender' to something or 'win' something or 'lose' something then actually you're kind of on the back foot already with creativity….So, for me language is extremely important because that's how we view the world and that's then in our perception, it's what we create ….The creativity of the unspoken can actually bring you to a place where you can both be together and understand each other…Because you can be saying the same words, but people don't see what it is you're saying, they don't hear what it is that you're saying and for me it's the space between and is that space open?"

"What's the louder voice?"

'Sally' also reflected on what is required to balance different modes of seeing within the individual for creativity to blossom. Specifically the artistic modes of insight and intuition, with the analytical approach, the cultivation of mindfulness and becoming aware of feelings in the body as they arise:

"I think the key is to be mindfully aware of when they're coming together. What dialogue is happening between them as it's happening, what's the louder voice? What's going on within you at the time? And cultivating that mindfulness …. Do you enter into a battle with these things? Which is how we've been brought up….If we think about entering into a relationship with your right and left hemispheres [of the brain], with your analytical side and your artistic side - that for me has a totally different energy about it…. I think that's where creativity is born."

"What the hell am I doing? I'm not supposed to be doing this"

'Sally' also described the profound challenges she had in coming to terms with the new ways of seeing she was being asked to develop:

"I had the most profound experience with the groundsel plant when I did Goethean science. …I was sat there in front of this plant thinking "Oh my God! What the hell am I doing? I'm not supposed to be doing this! If my Dad saw me doing this? And if my friends saw me doing this, they'd think I'd gone off my rocker!" I was trying to let this plant talk to me or see it differently….to go upstream and be with it outside of labels or pre-judgements…. And I dropped into this chasm, this void for a week where I couldn't say anything. It was like this whole silence thing - it freaked me out, it really, really freaked me out. And I didn't know what was happening to me….I was in a completely different relationship with the plant - allowing - not coming to it with any preconceived ideas and not knowing what to do with that. Not knowing how to be with it. And I was just totally overwhelmed. I felt energetically that something was happening, but I had no words. And I remember saying to Philip [Franses] "I've got no words, I don't know what I'm supposed to be doing". He says, "You're not supposed to be doing anything". Because I wanted... "this is what you do"...and you can't do that with phenomenology or Goethean science. You just have to 'notice' and 'be with' and I don't think I'd ever 'noticed' or 'been with' (in relationship with) anything before in that way. So, I was in a place of the unknown and quite fearful I think because I kept dropping into "I've got to justify this" and I couldn't justify it…..Even though I was spiritual and I had a spiritual way of understanding, I was only understanding in the mechanistic way."

"A newborn baby"

'Sally' reflected on perception and the challenges of maintaining the state of Being of the dynamic way of seeing, rather then slipping back into old patterns of mechanism, while at the same time accepting the dynamic nature of the process of transformation with its ebbs and flows:

"So it is our perception that shapes the world around us. And then you know it sort of does open the question as to what [is required] to move into a different paradigm. We need to be having these conversations between these different ways of seeing. So, how do we come together with these different ways of seeing in an open and free way?....I'm still trying to ground this way of looking at things into my psyche, into my way of Being. And it's not something that can happen to anybody overnight for a transition to take place…. I've been exposed to the opposite of what mechanistic thinking and the mechanistic paradigm I've been brought up in is…. This is like this brand new way of viewing the world that I'm like a newborn baby in and I'm trying to find language for it, to articulate [it] and be with [it]. And so, how would I bring that to mainstream scientists? I don't know, because I'm still trying to live this and understand it myself. Does that make sense? I'm really worried that when I leave here I'm not going to be able to speak to anybody because of my experiences and the way that I am now viewing

the world. I don't want to keep falling back into an old way of Being….So, I had 35 years of keeping things apart, the mechanistic way of thinking and now it's like, have I got another 35 years to integrate, so that they're both balanced? If we can start with children before they get indoctrinated, programmed and everything else it's going to be so much easier. But you need to have this seed change within the people that are the elders first of all to bring this to the younger people."

"I found that I've been free all along"

'Sally' ended on an optimistic note, recognising that it was her perceptions that had trapped her. She found her own sense of freedom and self-expression:

"Expressing yourself is surely an act of creativity. But when you're not allowed to express yourself fully - how you are - that is stopped. So part of who you are is stifled to conform into this box that defines you. And that's why I came here because I didn't want to be defined. I didn't want to be boxed in. I wanted my freedom. Interestingly, I found that I've been free all along. It's just my perceptions, my programming that's boxed me in! So, there's something about Schumacher that enables you to be you and people don't judge you and they just allow you to express yourself, which means that these things that you've buried or have been embryonic through the whole of your life start to be watered and out they come….. It is completely open and I think that's what I've learned here. Well, yeah, OK, we have to turn up at certain times for things, we have to learn certain things, but there is an openness too. It's how do you actually walk that really fine line of paradox, the line between the yin and the yang in the Tao, knowing that we are literally a walking paradox ourselves."

Post-script: November, 2014

"It is now three months since I completed my MSc thesis and left Schumacher, and I am still integrating the experience into my whole being. It was an incredible year of learning and deep transformation, which gave me far more than I could ever succinctly put into words.

I feel very much like a baby, taking my first tentative steps out in the world, but this time as a free human being; connected to my human family, the Earth and the Universe, but in my own way. I am finally able to be myself, differently, and not be forced to be like everyone else. And therein lies the paradox; by being myself, I realise that I share the same ground as all phenomena (animal, mineral or vegetable), but I am free to express that common ground differently – in my own way, which allows me to fully access my authenticity and creativity. I feel like the living expression of Bortoft's 'multiplicity in unity', instead of the reductionist world that I had inhabited which created 'unity in multiplicity'.

Oftentimes I feel overwhelmed and sense that people do not understand me, however, I feel more comfortable with who I am becoming. Before Schumacher, I always felt that there was something missing in my life, but didn't know the reason why! Of course there are times when I find myself acting in a mechanistic/ fragmented way. However, what is interesting is that I am able to notice this, if not immediately, then very quickly and remember the truth of my authentic self.

I am looking forward to my future as I continue to see the world in a brand new way (yet paradoxically, a way that feels true and familiar), and embrace the wholeness of who I am; so that I can be a creative, dynamic, authentic expression of the wonder and mystery of the force that animates 'All That Is'."

A fine achievement

This is surely a fine achievement– a student set free, to "embrace the wholeness" of who she is becoming– "her authentic self", a "walking paradox" balancing knowledge and meaning and ready to participate in and face the challenges of a rapidly changing world, where the old ways and the new ways co-exist in creative tension.

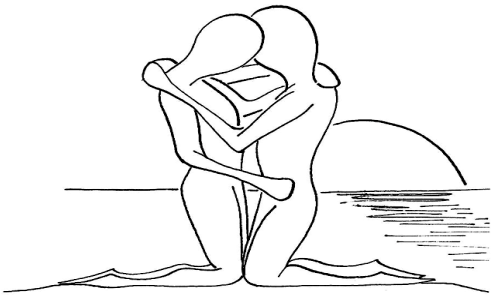

Figure 1*: "In all things we learn only from those we love."* Goethe (Zajonc, 2006). *Pen and Indian ink drawing by MW.*

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Mike Wride *is an Assistant Professor in Zoology at Trinity College Dublin(TCD). His research has been in Zoology, Molecular Biology, Cell Biology, Lens Development . He is a visiting lecturer on the MSc Holistic Science course at Schumacher College.*

Transformative Learning for Sustainable Living
Schumacher College

Many people are now calling for a global shift in consciousness – ***a new story for mankind***. If we are to do this and hope for a future that is just and sustainable for all, we need to draw on spiritual traditions and indigenous wisdom from around the world and a contemporary understanding of the nature of mind and consciousness. We need to explore the interface between our inner landscape and the outer world. The social, ecological and economic challenges that face us are a clear demonstration that information and expertise alone will not create the shift we want towards more resilient, creative, equitable and sustainable communities. Instead we need to dig deep to the core of humanity to explore the myths and stories, beliefs and values that define our purpose and action in the world.

:*"Spiritual values are at the core of human wellbeing. At the root of environmental and social crisis the world is facing a spiritual crisis. To explore the world's wisdom, tradition and spiritual values is a bold step we can take in the right direction. We need a shift from the old story of materialism to a new story of creating harmony between the material and the spiritual."* - Satish Kumar co-founder of Schumacher College and editor of Resurgence and The Ecologist Magazine.

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Rachel Fleming *has a background in environmental science and policy & a PhD in ecological risk assessment & pollution control. After senior positions at the Environment Agency and Defra, she realised that education & communication was her best contribution towards positive change. She has founded many sustainable-living publications of her own. She now runs the communications and development work at Schumacher College.* **http://www.schumachercollege.org.uk**

INTER SPECIES COMMUNICATION

*Anna Breytenbach (**AB**) in conversation with Philip Franses (**PF**). Anna Breytenbach is an interspecies communicator who has shown, under documented conditions, a complete communion with the history, experience and mood of the animal she is with (see www.animalspirit.org).*

PF: When you were young, were you aware of a tension in yourself, that there was something inside you which needed to be expressed?

AB: Tension is exactly the right word. Most people ask if I was aware of telepathically communicating with animals and I certainly wasn't. But I was aware of a tension about seeming to sense in non-specific ways, something that might or might not be appropriate for an animal, even a domestic animal or one by the side of the road. I would have a sense of what would be needed. Yet everything that was said or told, or executed upon, was the exact opposite. So there was a tension around a form of compassion in me, that didn't find any agreement with in the adult world. There was no agreement for the compassion or what I felt animals needed or wanted. There was no agreement in the adult world for even what I said they wanted or needed. There would just be, 'Don't be silly, this is better for them', instead. But the inner tension was around feeling with domestic animals or thirsty potted plants in the classroom in nursery school, feeling with and yet seeing the adults around me not noticing or not feeling, that there was anything wrong. That tension was between my own direct experience and how I was told the world was. I was very shy by nature anyway, so all I did with that was to internalise it and over the years, suppress it and stop paying any attention to my own direct experience.

PF: You mentioned that 15 years ago you were working in software. How did you then wake up?

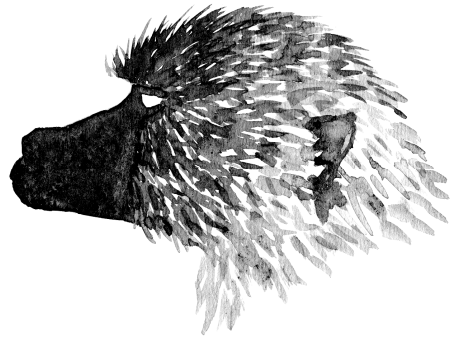
AB: Despite being in the very left brain, logical world of IT and software, some little flame in me had stayed alive, some flame of passion for nature and wild life survived in me. Not having studied veterinary science, the only way I could see to act upon that and enjoy it and feel useful was to volunteer at Wild Life Rescue places. So after my IT day job I would go and spend 7 or 8 hours a couple of times a week at a squirrel rescue centre. I trained as a cheetah handler in the mid ninety's and did conservation talks for cheetahs and helped out at captive animal centres. So all very worldly, and involving animal care or rehabilitation. I just exhausted myself really, but that was part of the catalyst for change. I had a very mentally stimulating career, 12 -14 hour days, but I couldn't drop my passion so I was spending evening and weekends doing welfare animal conservation, and just got exhausted in the end. So that got me out of my comfort zone. Something had to give. It was the day job that got the boot.

But already by then, I had some other experiences that were beginning to form. I had spontaneous experiences of receiving information intuitively, directly from an animal that I couldn't explain. I couldn't explain how I got the information that would prove to be correct. For a while I thought this is it, I'm seeing things, I'm going mad, I'm being influenced by some outside force, all these scare stories mostly born of a very rigid Roman Catholic upbringing. But again (this is when I was living in the US), I would be out looking at footprints in the snow and I would get a sense of the shape of the animal's face or the body or the kind of animal that had made those footprints without having any book knowledge or any prior knowledge at all, certainly not at a biological level. When I would try to describe my mental vision to the tracking instructor, he would say, "Yes , those are Coyote tracks". I

didn't even know what a Coyote was! What is a Coyote? This made me realise that more was going on, and I was picking up information I couldn't explain. Having a very strong cognitive mind and being very inclined in that way, I did a lot of research, and came across this field, "Telepathic Interspecies Communication" and read a lot about it. I read Rupert Sheldrake's work and explored some more and chose an institute to study with. It still took three years though, between realising that I wanted to get out of the corporate world and somehow use my passions, and actually doing it. And that was because of a combination of the golden handcuffs of having a salary, life as the usual treadmill thing, but also imagining I had to construct my future reality and design it at least, before stepping into it. I spent untold weeks and months trying to work out and design how my new life and career might look like when following my passion, doing so many iterations. They were all quite fruitless really, because I couldn't know from this side of the curtain what the possibilities were. So it took me three years of that doodling to finally give it up and take a leap into the unknown anyway, which was the best possible thing. On the other side of the leap, the emergent reality and the calling could really take form.

PF: So you set up animalspirit.org then?

AB: Not formally. Then it was just me running around giving talks and consultations. It took a while before realising I could utilise my business background to create a bit of a platform for it. Fourteen years later, I am working full time, with a full time partner working with me, and a part time assistant. It is still very small and humble. Formalising it in terms of websites and processes, also helped give it more of a foothold in the world, as well as for myself too. I really imagined I would have to have that in place first. But that was not at all true. That false belief was what really slowed me down. I could have done this three years earlier if I had taken the leap I would take anyway. I am also grateful for all the experiences I have had not in line with my calling. Whether fixing a problem of a PC, or organised ways of thinking I am very grateful for the path I travelled. It made me hold my own and interface with the mainstream even though what I am doing now is far from mainstream.



By Pete Winfield

PF: It is stunning to see pictures of you with the baboon troupe or the black panther and the complete transparency with which you are able to exchange an understanding of their situation. There are many things that come up in that. How do you feel the journey you are on, in yourself?

AB: That has been the most surprising aspect, how much of a personal or spiritual journey or journey to self this has been. People normally only see the outside expression of this, which is my interaction with the animals or facilitating workshops or facilitating people in their journey. But by far the deepest and most useful journey is the ongoing one of the work on self. You see, if I am to be accurately reflecting the animal's truth and being a voice for animals and wild places and their environments, I need to be as clear a conduit as possible. And that means doing the personal work to keep on clearing out my own stuff, my own baggage, my preconceptions, shyness, things like that. One of the first things I had to get over and had to be very transparent about was not being afraid of looking like an idiot. Even when what I'm saying is real some people think I am an idiot, or want to nay-say or heckle or worse. I have had quite some attacks in the public forum, particularly online, from people who cannot even entertain the possibility that this might be real, so would like to shoot me down in flames. So there has been

quite a personal journey, to say what is true for me, anyway, regardless of the consequences even for myself. It has been an incredible journey into my own authenticity. I cannot be authentic to what the animals are conveying through me until I can be really authentic with myself.
That might include expressing my own hesitancy about passing on something an animal has relayed, or saying I am nervous to say this to a person because of the consequences; telling wild life managers what they may not want to hear makes me feel nervous and upset but I am going to tell them anyway. And that has really helped me be much more authentic and much more transparent. Outside of doing the communication I have to work to continuously be distilling and calming my mind, to get over the upset feelings I have in the very distressing circumstances of some of the species I am consulting with. A whole lot happens behind the scenes.

PF: There is something being revealed in the communication and you show a slide of a whale saying '*Save the Humans*'. There is a huge implication for us that there is this wisdom that is there in the world, that you are tuning into but most of us aren't. There is a huge implication there and there is something vital in what you are doing.

AB: There really, really is. A lot of people want to praise me, "Oh you are doing so much for the animals." I don't know how to convey that I feel it is the opposite. It doesn't mean that isn't true. But I have gained much more than I have given by being there to listen to them. I have gained exactly what you are saying. They have taught me so much about ways of being. Not as instruction, not as advice but by sheer resonance. They have resonated and been oozing who they are. The more we connect with any aspect of nature, the more we come into resonance with that, the more we can be fully ourselves. We can access that vitality, and that relationship with life, that connection not only with apparently external nature with a capital N, but with our own nature too, our own inner nature. And in that we can partake more consciously, in this wonderful dynamic dance with all of life around us the whole time. It ceases even to become a technical overt act, to decide to sit down at a particular time, go into a meditative state to have a communication with an animal. That is far too linear and only one thread in the beautiful web of life one gains access to. One begins to feel pulled towards dancing, swimming in this delightful soup of the real reality. It is a challenge to try to convey that holistic and vital direct knowing of the fullness of reality to people saying "Oh that isn't real." It is a very interesting challenge, to have to argue with, debate with and prove to main stream thinking(which appears to have jurisdiction over reality). When those of us who are more connected to nature, are seeing the order of a magnitude of reality that cannot be described.

PF: So talking about the mainstream brings me to quantum theory, which you talk about as a bridge. Quantum theory says there is no objective reality, there is always a meeting of subject and object, there is no further you can go, in understanding the world. Where the mainstream has taken that is to go further into materialism. One ends at the atom, which is the building block of everything. So it seems to me that what you are doing is approaching that truth from the other side, from the side of the subjective. The way matter is formed crosses individuality and species. Those messages you receive are embodied in the shared possibility you have with the animals.

AB: Yes, very much so. Although the analogies we use in the so called teaching tend to imply object- subject in some sort of transference, as if there is a data pack being exchanged, that is not how it is at all. It feels much more like object and subject dissolving. The seer and seen dissolve and there is just pure seeing in that shared possibility world.

PF: I am very involved myself in trying to look at how you can open up quantum theory, not to end up in matter, but in the potential of the spirit that this implies, which is huge.

AB: I'd love to answer that question too. I used to live very close to the Stanford Linear Accelerator Centre, where they send two particles 25 kilometres apart. They subject one to certain conditions, and the other particle shows a related effect! There is relatedness, an ongoing kinship, across space and time. So there might be something that opens up quantum theory to really explore the metaphysics of things.

PF: For me there is a space of possibility, that you enter and the space of possibility is the moving thing that delivers a resolution. That resolution has an illumination to it. Only when you realise the illumination, does time comes into being.

AB: Yes, that is the order of appearance of things like time.

PF: You can put together these elements that are involved in quantum theory in a different way. It is not that space and time are there at the beginning and you have to then get people to communicate. There is in the beginning, this space of possibility and that is what coheres through an illumination. Then you can say there is time.

AB: Yes, as an afterthought or after lens through which to observe some of the things that have happened, that have really reached a resolution. And I experience this in a way through some of the necessary facilitation, teaching and mentoring challenges. For it is really a journey of remembering, of dropping everything we think we know, not even just the concepts but also the processes of what we value as valid processes, even dropping thinking about our processes. So people say to me how should I ask a specific question to an organism which is very far from being human to which I cannot relate. The moment we try to measure anything, we are lost. That is the problem. It is about entering this realm of possibility and for us humans to do that experientially, it is about dropping everything, and just retaining enough awareness for us to know about what is happening as it is happening or busy miracle-ing and illuminating. It would be wonderful if there was some convenient tool around, to give us all a *kaboosh* over the head, we could do the telepathy fine and when we wake up we would know what happened. That would be awesome.

Having to put words and a structure to a conversation, is a very contrived concept, and mostly for the sake of our human brains to come to the party. You are immersed in the world of possibility with another being, if you can even imagine that to be finite, which of course it isn't in the first place. What arises, out of that communion (a personal definition of which is communication in action) is what is felt and known and shifted or transformed. And it is not that the human doing the communicating is unchanged. Even in something as simple as temporarily knowing the perspective of an entirely different species, that becomes part of the experience knowledge data bank, we cannot un-know it. Once we feel the butterfly wings as if we had them, we cannot un-know that. So we are

By Frits Ahlefeldt

affected. We are not objective beings having a dry conversation with another. What would the entry points into that field of possibility be? How can science change even the more subtle traditional ways of thinking?

PF: The surprising thing in physics is what moves is the space and not the time, the time comes later. Our space can move with others when we open up to them. How do we shift this whole society to something else? How do we open up to the space of possibilities, and listen to what resolution there is in that space? When we get there we will know what the sequence of resolution was.

AB: That answers questions like, What do we do? How can we make a difference to the planet? And the horror stories of the trajectory of the way things are going. It has to be connection first. Just connection. Only after connection will we even know what is possible. For it is going to arise out of the connection. We will then be able to have spontaneous right action and co-creation with other aspects of life. It is that stage we have to get into and from that will arise whatever can, without describing the roadmap to get there, a retrospective hindsight realisation.

PF: So when you look at where you are now and where you want to go, how do you see that?

AB: Certainly wish I had the time for research and development. I have got used to being at the edge of what is acceptable so I have got over that, I am used to that. I have long felt called to really explore what is possible, and all I can say is just leave a gap of time and space open for just research and development, not the cognitive kind, not to go researching things that have already been written, or go down the rabbit hole that has already been explored. But to really look into what kind of refinements of states of being might be possible, what some of the aids or tools there might be to access these states. I don't imagine that inquiry need happen totally within my or even the human realm. Part of that inquiry might be going to nature with this very heartfelt curiosity and inquiry and request for assistance. Probably what that looks from the outside is me going really quiet for a year or so, and really feeling myself into co-creating with nature whatever can be co-created as a way to help humans into a different state. There are a few very outside the box initiatives that propose some new ways of viewing entire eco-systems. My own development will be co-creating with Nature, rather than a structured design approach. The time is right for me to feel into a different realm of possibility.

(**PF**) So the question to ask is: What is possible for humanity, using the same way of listening?

(**AB**) Yes, that's right!

(**PF**) ***We*** are the animals in danger!

Monk Seal
Critically Endangered

By Frits Ahlefeldt

Anna Breytenbach *is a South African-based professional animal communicator who has been practising for 14 years in South Africa, Europe and the USA with both domestic and wild animals. Amongst other things she has been a cheetah handler, served on committees for wolf, snow leopard, cheetah and mountain lion conservation, volunteered at wildlife and horse sanctuaries and participated in wild wolf tracking expeditions in the Rocky Mountains. Anna's goal is to raise awareness and advance the relationships among human and non-human animals, on both the personal and spiritual levels. In her communication and conservation work, she guides people to deepen their connection with all species in an honouring manner, and is inspired by being a voice for the animals and natural environments.* **http://www.animalspirit.org**

EXCERPT FROM REPORT ON PROCESS AND PILGRIMAGE IN CORDOBA

PHILIP FRANSES

In June 2014 we held a *Process and Pilgrimage* event in Cordoba at Albayda Centre and the Tea House of Salma al Farouki. Introducing the event, my invite was for us to explore freedom to self, freedom to other, and freedom in relation to God. On the second evening it felt as if we had hit a brick wall of the connotations these words already had. Were these words not just institutional similitude?

On day two of the gathering, a rather too rich afternoon programme hurried us to a museum, to a talk on Ibn Arabi, whose insights had to be worked out from the fragments of translated parts of sentences, then into eating, and further into a Sufi prayer that seemed to take us away from all known ground, into a darkness approaching midnight and returning us to our accommodation of being totally unsure of the way we were supposed to be following.

In the middle of the night, I wrestled with this darkness and my folly of having let the way slip from my grasp into a busyness that was set to repeat the next day. Every detail of existence seemed fallen from existence; the bedroom too big, the arrangements flawed, the whole endeavour cast upon futility.

Only in the early hours does an answer resonate of the difference between the God that is named in tradition and the process of "naming" that is always unique and meaningful. Naming does not happen in closed secluded gatherings. Naming happens in the everyday-ness of common speech. The next liberation at four in the morning is the realisation that we can change the program, the timetable is not prescriptive. Instead of rushing the afternoon in another series of excursions, we can open inward to another session of our own group.

The next morning everyone agrees on having a second session together, rather than heading back to town. A participant talks about the infinite coming to earth being the real aim of the gathering. This statement is the invitation for my night-filled wrestling to find voice.

The infinite, only appears when it is given a form. What we are doing in meeting to talk about God, is not to reverence some static image of Heaven. What is required is that a form is found in which God becomes an everyday aspect of existence on earth.

As example in India in "naming emptiness", emptiness then turns into the most everyday experience. The naming of emptiness, in meditation and the use of '0' in the number system made of the concept of "emptiness", something that was intuitively obvious to everyone. The naming brought the mystery into everyday use.

When we talk about a new revelation coming to earth, we mean this also in an everyday sense, in which the infinite is made routinely accessible through a speaking of its quality in everyday parlance.

The naming is not a fixing but is as when one is in love and the name of the other comes into one's heart. All the different aspects of being are surprises that enrich the openness of naming. The naming is an address of the

potential which has many contradictory forms, held in a single address. And once the naming has occurred, its meaning pervades all activity without comment, or intellectual effort, or need for systemisation.

Naming does not form out of something totally new, but arises in the dark wasteland of where the old names have fixed the world in stasis. Renewal comes through the very form that had fixed itself in a final description of the world. Naming renews the relation to the mystery. Our task is to name the world in all its mystery anew through the old elements that have outworn their usefulness.

And now, the silence speaks the need that the mystery be given a new name, in which everyday existence may form. Everything inverts until the very names we have for things translate to a calling through light into the mystery of the future. In this appeal to naming, light is born anew, without reference to any "thing" that existed before. There is no sense from an old perspective for what happens. And yet in the naming, if faith and patience are followed, the world attains a new orientation for its speaking. The speaking of the word is the very source of the light about which the world coheres in mystery. The silence when entered, is bound by its ancient principle, to deliver itself to the word of naming.

To read the full report, please visit:

www.journeyschool.org

Philip Franses *is the originator of the* ***Process and Pilgrimage*** *inquiry forum which he began in 2009. After studying Mathematics at Oxford University, academia's dull explanation of the world inspired Philip on a counter-journey into the depths of experience, travelling and a re-sensitisation to quality. He teaches Complexity Theory and Goethean science at Schumacher College. He is also the Editor in Chief of the Holistic Science Journal.*

philip@schumachercollege.org.uk

The most highly developed branches of the human family tend to produce a definite type of personality which refuses to be satisfied with what other men call 'experience', and is inclined, to "deny the world in order that it may find reality." These people occur in the east and the west, and in the ancient, mediaeval, and modern worlds. Their one passion appears to be a certain spiritual and intangible quest: a "way out" or a "way back" to some desirable state which alone can satisfy their craving for absolute truth. This quest, constitutes the whole meaning of life. Whatever the place or period in which they have arisen, their aims, doctrines and methods have been substantially the same. Their experience, therefore, forms a body of evidence, curiously self-consistent and often mutually explanatory, which must be taken into account before we can add up the sum of the energies and potentialities of the human spirit, or reasonably speculate on its relations to the unknown world which lies outside the boundaries of sense.

Under whatsoever symbols they have objectified their quest, none of these seekers have ever been able to assure the world that they have found, seen face to face, the Reality behind the veil. But if we may trust the reports of the mystics, and they are reports given with a strange accent of certainty and good faith, they have succeeded where all these others have failed, in establishing immediate communication between the spirit of man, and that "only Reality," which some philosophers call the Absolute, or God. This, they say, and here many who are not mystics agree with them, is the hidden Truth which is the object of man's craving; the only satisfying goal of his quest. Like geographical explorers the mystics are the pioneers of the spiritual world, and we have no right to deny validity to their discoveries, merely because we lack the opportunity or the courage necessary to those who would prosecute such explorations for themselves.

These matters are so remote from our ordinary habits of thought, that their investigation entails a definite preparation: a purging of the intellect. As with those who came of old to the Mysteries, purification is the gate of knowledge. We must come to this encounter with minds cleared of prejudice and convention, must deliberately break with our inveterate habit of taking the "visible world" for granted; our lazy assumption that somehow science is "real" and metaphysics is not.

Such a criticism of reality is of course the business of philosophy. Amateurs though we be, we cannot reach our starting-point without trespassing to some extent on philosophic ground. That ground covers the whole area of first principles: and it is to first principles that we must go, if we would understand the true significance of the mystic type.

Mysticism

by Evelyn Underhill
[1911]

Let us then begin at the beginning: and remind ourselves of a few of the trite and primary facts which all practical persons agree to ignore. That beginning, for human thought, is of course the I, the Ego, the self-conscious subject

which is writing this, or the other self-conscious subject which is reading it; and which declares, in the teeth of all arguments, I AM. Here is a point as to which we all feel quite sure. No metaphysician has yet shaken the ordinary individual's belief in his own existence. The uncertainties only begin for most of us when we ask what else *is ?*

To this I, this conscious self "imprisoned in the body like an oyster in his shell," come, as we know, a constant stream of messages and experiences. Chief amongst these are the stimulation of the tactile nerves whose result we call touch, the vibrations taken up by the optic nerve which we call light, and those taken up by the ear and perceived as sound.

What do these experiences mean? The first answer of the unsophisticated Self is, that they indicate the nature of the external world: it is to the "evidence of her senses" that she turns, when she is asked what the world is like. As the impressions come in, or rather those interpretations of the original impressions which her nervous system supplies, she pounces on them, she sorts, accepts, rejects, combines: and then triumphantly produces from them a "concept" which *is,* she says, the external world. With an enviable and amazing simplicity she attributes her own sensations to the unknown universe. The stars, she says, *are* bright; the grass *is* green. For her, as for the philosopher Hume, "reality consists in impressions and ideas."

It is immediately apparent, however, that this sense-world, this seemingly real external universe—though it may be useful and valid in other respects—cannot be *the* external world, but only the Self's projected picture of it. Very slight investigation shows that it is a picture whose relation to reality is at best symbolic and approximate, and which would have no meaning for selves whose senses, or channels of communication, happened to be arranged upon a different plan. The evidence of the senses, then, cannot be accepted as evidence of the nature of ultimate reality: useful servants, they are dangerous guides. Nor can their testimony disconcert those seekers whose reports they appear to contradict.

The conscious self sits, so to speak, at the receiving end of a telegraph wire. Therefore this message, though it may in a partial sense be relevant to the supposed reality at the other end, can never be adequate to it. There will be fine vibrations which it fails to take up, others which it confuses together. Hence a portion of the message is always lost; or, in other language, there are aspects of the world which we can never know.

The sphere of our possible intellectual knowledge is thus strictly conditioned by the limits of our own personality. On this basis, not the ends of the earth, but the external termini of our own sensory nerves, are the termini of our explorations: and to "know oneself" is really to know one's universe. We are locked up with our receiving instruments: we cannot get up and walk away in the hope of seeing whither the lines lead. Eckhart's words are still final for us: "The soul can only approach created things by the voluntary reception of images.

Were such an alteration of our senses to take place, the world would still send us the same messages, that strange unknown world from which, on this hypothesis, we are hermetically sealed. But we should interpret them differently. Beauty would still be ours, though speaking another tongue. The bird's song would then strike our retina as a pageant of colour: we should see the magical tones of the wind, hear as a great fugue the repeated and harmonized greens of the forest, the cadences of stormy skies. If we realized how slight an adjustment of our organs is needed to initiate us into such a world, we should perhaps be less contemptuous of those mystics who tell us that they apprehended the Absolute as "heavenly music" or "Uncreated Light".

A direct encounter with absolute truth, then, appears to be impossible for normal non-mystical consciousness. We cannot know the reality, or even prove the existence, of the

simplest object. But there persists in the race a type of personality which does realize this limitation: and cannot be content with the sham realities that furnish the universe of normal men. It is necessary, as it seems, to the comfort of persons of this type to form for themselves some image of the Something or Nothing which is at the end of their telegraph lines: some "conception of being," some "theory of knowledge." It is doubtful whether any two selves have offered themselves exactly the same image of the truth outside their gates: for a living metaphysic, like a living religion, is at bottom a strictly personal affair—a matter, as William James reminded us, of vision rather than of argument. Nevertheless such a living metaphysic may, if well founded, escape the stigma of subjectivism by outwardly attaching itself to a traditional School.

Naturalism or Naïve Realism

Naturalism states simply that we see the real world, though we may not see it very well. What seems to normal healthy people to be there, is approximately there. It congratulates itself on resting in the concrete; it accepts material things as real. In other words, our corrected and correlated sense impressions, raised to their highest point of efficiency, form for it the only valid material of knowledge: knowledge itself being the classified results of exact observation.

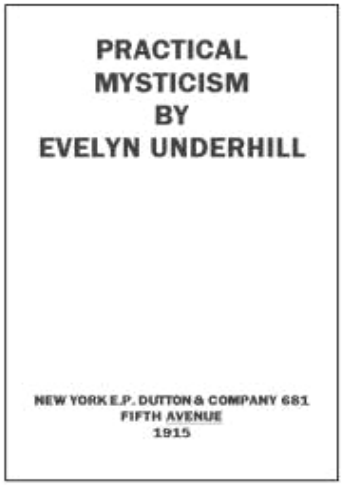
Such an attitude as this, may be a counsel of prudence, in view of our ignorance of all that lies beyond: but it can never satisfy our hunger for reality. It says in effect, "The room in which we find ourselves is fairly comfortable. Draw the curtains, for the night is dark: and let us devote ourselves to describing the furniture." Unfortunately, however, even the furniture refuses to accommodate itself to the naturalistic view of things. Once we begin to examine it attentively, we find that it abounds in hints of wonder and mystery: declares aloud that even chairs and tables are not what they seem.

The idea "house" is now treated by me as a real house, and my further observations will be an unfolding, enriching, and defining of this image. But what the external reality is which evoked the image that I call "house," I do not know and never can know. I may of course call in one sense to "corroborate," as we trustfully say, the evidence of the other; may approach the house, and touch it. Then the nerves of my hand will be affected by a sensation which I translate as hardness and solidity; the eye by a peculiar and wholly incomprehensible sensation called redness; and from these purely personal changes my mind constructs and externalizes an idea which it calls red bricks.

Science herself, however, if she be asked to verify the reality of these perceptions, at once declares that though the material world be real, the ideas of solidity and colour are but hallucination. They belong to the human animal, not to the physical universe: pertain to accident not substance, as scholastic philosophy would say. "The red brick," says Science, "is a mere convention. In reality that bit, like all other bits of the universe, consists, so far as I know at present, of innumerable atoms whirling and dancing one about the other. It is no more solid than a snowstorm.

Were you to eat of Alice-in-Wonderland's mushroom and shrink to the dimensions of the infra-world, each atom with its electrons might seem to you a solar system and the red brick itself a universe. Moreover, these atoms themselves elude me as I try to grasp them. They are only manifestations of something else. Could I track matter to its lair, I might conceivably discover that it has no extension, and become an idealist in spite of myself. As for redness, as you call it, that is a question of the relation between your optic nerve and the light waves which it is unable to absorb. This evening, when the sun slopes, your brick will probably be purple, a very little deviation from normal vision on your part would make it green. Even the sense that the object of perception is outside yourself may be fancy; since you as easily attribute this external quality to images seen in dreams, and to waking hallucinations, as you do to those objects which, as you absurdly say, are *'really there.'"*

Further, there is no trustworthy standard by which we can separate the "real" from the "unreal" aspects of phenomena. Though for practical purposes we have agreed that sanity consists in sharing the hallucinations of our neighbours. Those who are honest with themselves know that this "sharing" is at best incomplete. By the voluntary adoption of a new conception of the universe, the fitting of a new alphabet to the old Morse code, what we might call 'acquiring knowledge', we can and do



change to a marked extent our way of seeing things. We build up new worlds from old sense impressions, and transmute objects more easily and thoroughly than any magician. Only the happy circumstance that our ordinary speech is conventional, not realistic, permits us to conceal from one another the unique and lonely world in which each lives. Now and then an artist is born, terribly articulate, foolishly truthful, who insists on "Speaking as he saw." Then other men, lapped warmly in their artificial universe, agree that he is mad or, at the very best, an "extraordinarily imaginative fellow."

Moreover, even this unique world of the individual is not permanent. Each of us, as we grow and change, works incessantly and involuntarily at the re-making of our sensual universe. We behold at any specific moment not "that which is," but "that which we are", and personality undergoes many readjustments in the course of its passage from birth through maturity to death. The mind which seeks the Real, then, in this shifting and subjective "natural" world is of necessity thrown back on itself: on images and concepts which owe more to the "seer" than to the "seen." But Reality must be real for all, once they have found it: must exist "in itself" upon a plane of being unconditioned by the perceiving mind. Only thus can it satisfy that mind's most vital instinct, most sacred passion, its "instinct for the Absolute," its passion for truth.

You are not asked, as a result of these antique and elementary propositions, to wipe clean the slate of normal human experience, and cast in your lot with intellectual nihilism. You are only asked to acknowledge that it is but a slate, and that the white scratches upon it which the ordinary man calls facts, and the Scientific Realist calls knowledge, are at best relative and conventionalized symbols of that aspect of the unknowable reality at which they hint. This being so, whilst we must all draw a picture of some kind on our slate and act in relation therewith, we cannot deny the validity, though we may deny the usefulness of the pictures which others produce, however abnormal and

impossible they may seem. Yet as the theologian claims that the doctrine of the Trinity veils and reveals not Three but One, so the varied aspects under which the universe appears to the perceiving consciousness hint at a final reality, or in Kantian language, a Transcendental Object, which shall be, not any one, yet all of its manifestations; transcending, yet including the innumerable fragmentary worlds of individual conception. We begin, then, to ask what can be the nature of this One; and whence comes the persistent instinct which, receiving no encouragement from sense experience, apprehends and desires this unknown unity, this all-inclusive Absolute, as the only possible satisfaction of its thirst for truth.

Concept of Being, Idealism

This second tradition takes us far from the material universe, with its interesting array of "things," its machinery, its law, into the pure air of a metaphysical world. Whilst the naturalist's world is constructed from an observation of the evidence offered by the senses, the Idealist's world is constructed from an observation of the processes of thought. There are but two things about which we are sure: the existence of a thinking subject, a conscious Self, and of an object, an Idea, with which that subject deals. We can know, both Mind and Thought. What we call the universe is really a collection of such thoughts. Reality, says Objective Idealism, is the complete, undistorted Object, the big thought, of which we pick up these fragmentary hints: the world of phenomena which we treat as real being merely its shadow show or "manifestation in space and time."

According to the form of Objective Idealism here chosen from amongst many as typical, for almost every Idealist has his own scheme of metaphysical salvation, we live in a universe which is, in popular language, the Idea, or Dream of its Creator. All life, all phenomena, are the endless modifications and expressions of the one transcendent Object, the mighty and dynamic Thought of one Absolute Thinker, in which we are bathed. This Object, is interpreted by the senses and conceived by the mind, under limitations which we are accustomed to call matter, space and time. But we have no reason to suppose that matter, space, and time are necessarily parts of reality; of the ultimate Idea. Probability points rather to their being the pencil and paper with which we sketch it. This supreme unity is hinted at dimly by illusory appearances that make up the widely differing worlds of "common sense," of science, of metaphysics, and of art . This is the sense in which it can truly be said that only the supernatural possesses reality, all the rest is the world of appearance which our receiving instrument manufactures.

There is this to be said for the argument of Idealism: that in the last resort, the destinies of mankind are invariably guided, not by the concrete "facts" of the sense world, but by concepts which are acknowledged by every one to exist only on the mental plane. In the great moments of existence, when he rises to spiritual freedom, these are the things which every man feels partake more of the nature of reality than any "fact" could do; and man, dimly recognizing this, has ever bowed to them as to immortal centres of energy. Religions as a rule are steeped in idealism: Christianity in particular is a trumpet call to an idealistic conception of life..

In Idealism we have perhaps the most sublime theory of Being which has ever been constructed by the human intellect: a theory so sublime, in fact, that it can hardly have been produced by the exercise of "pure reason" alone, but must be looked upon as a manifestation of that natural mysticism, that instinct for the Absolute, which is latent in

man. But Idealism fails to find in practice the reality of which it thinks so much and in the words of St. Jerome which marked the distinction between religion and philosophy, "Plato located the soul of man in the head; Christ located it in the heart." That is to say, Idealism, though just in its premises, is stultified by the exclusive intellectualism of its own methods: by its fatal trust in the squirrel-work of the industrious brain instead of the piercing vision of the desirous heart. It interests man, but does not involve him in its processes. Hence the thing that matters, the living thing, has somehow escaped it, and its observations bear the same relation to reality as the art of the anatomist does to the mystery of birth.

Philosophic Scepticism

This is the third Theory of Being to be considered. This is the attitude of those who refuse to accept either the realistic or the idealistic answer to the eternal question. Confronted in their turn with the riddle of reality, they reply that there is no riddle to solve. We of course assume for the ordinary purposes of life that for every sequence a: b: present in our consciousness there exists a mental or material A: B: in the external universe, and that the first is a strictly relevant, though probably wholly inadequate, expression of the second. The bundle of visual and auditory sensations, for instance, whose sum total I am accustomed to call Mrs. Smith, corresponds with something that exists in the actual as well as in my phenomenal world. Behind my Mrs. Smith, behind the very different Mrs. Smith which the X rays would exhibit. There is, contends the Objective Idealist, a transcendental, or in the Platonic sense an ideal Mrs. Smith, whose qualities I cannot even guess; but whose existence is quite independent of my apprehension of it. But though we act on this hypothesis, it remains only a hypothesis; and it is one which philosophic scepticism will not let pass.

The external world, say the sceptical schools, is a concept present in my mind. If my mind ceased to exist, so far as I know the concept which I call the world would cease to exist too. The one thing which for me indubitably *is,* is the self's experience, its whole consciousness. Outside this circle of consciousness I have no authority to indulge in guesses as to what may or may not Be. Hence, for me, the Absolute is a meaningless diagram, a superfluous complication of thought. Every effort made by philosophy to go forth in search of it is merely the metaphysical squirrel running round the conceptual cage. In the completion and perfect unfolding of the set of ideas with which our consciousness is furnished, lies the only reality which we can ever hope to know. Far better to stay here and make ourselves at home: only this, for us, truly is.

This purely subjective conception of Being has found representatives in every school of thought: even including by a curious paradox, that of mystical philosophy, its one effective antagonist. Thus Delacroix, after an exhaustive and even sympathetic analysis of St. Teresa's progress towards union with the Absolute, ends upon the assumption that the God with whom she was united was the content of her own subconscious mind. By its utter denial not merely of a knowable, but of a logically conceivable Transcendent, it drives us in the end to the conclusion of extreme pragmatism; that Truth, for us, is not an immutable reality, but merely that idea which happens to work out as true and useful.

Logically carried out, this conception of Being would permit each man to regard other men as non-existent except within his own consciousness: the only place where a strict scepticism will allow that anything exists. Man is left a conscious Something in the midst, so far as he knows, of Nothing, with no resources save the exploring of his own consciousness.

Philosophic scepticism is particularly interesting to our present inquiry, because it shows us the position in which "pure reason," if left to itself, is bound to end. It is utterly logical; and though we may feel it to be absurd, we can never prove it to be so. Those who are temperamentally inclined to credulity may

become naturalists, and persuade themselves to believe in the reality of the sense world. Those with a certain instinct for the Absolute may adopt the more reasonable faith of idealism. But the true intellectualist, who concedes nothing to instinct or emotion, is obliged in the end to adopt some form of sceptical philosophy. The horrors of nihilism, in fact, can only be escaped by the exercise of faith, by a trust in man's innate but strictly irrational instinct for that Real "above all reason". The intellectual quest of Reality, then, leads us down one of three blind alleys: (1) To an acceptance of the symbolic world of appearance as the real; (2) to the elaboration of a theory also of necessity symbolic—which, beautiful in itself, cannot help us to attain the Absolute which it describes; (3) to a hopeless but strictly logical scepticism.

Science cannot even divide with a sure hand the subject and object of thought, though its business with phenomena and our knowledge of them is idealist at heart. It has become accustomed to explain that all our ideas and instincts, that pictured world that we take so seriously, ministers to one great end: the preservation of life, and consequent fulfilment of that highly mystical hypothesis, the Cosmic Idea. Each perception serves a useful purpose in this evolutionary scheme: a scheme, by the way, which has been invented by the human mind, and imposed upon an obedient universe.

By vision, hearing, smell, and touch, says Science, we find our way about, are warned of danger, obtain our food. The male perceives beauty in the female in order that the species may be propagated. It is true that this primitive instinct has given birth to higher and purer emotions; but these too fulfil a social purpose and are not so useless as they seem. Man must eat to live, therefore many foods give us agreeable sensations. If he overeats, he dies; therefore indigestion is an unpleasant pain. Certain facts of which too keen a perception would act detrimentally to the life-force are almost impossible of realization, for example, the uncertainty of life, the decay of the body, the vanity of all things under the sun. When we are in good health, we all feel very real, solid, and permanent; and this is of all our illusions the most ridiculous, and also the most obviously useful from the point of view of the efficiency and preservation of the race.

But when we look closer, we see that this brisk generalization does not cover all the ground, indeed, it is more remarkable for its omissions than for its inclusions. Récéjac has said "from the moment in which man is no longer content to devise things useful for his existence under the exclusive action of the will-to-live, the principle of (physical) evolution has been violated." Man has been called a tool-making animal by utilitarian philosophers, it is the highest praise they know how to bestow. More surely he is a vision-making animal, a creature of perverse and unpractical ideals, dominated by dreams no less than by appetites. He moves towards some other goal than that of physical perfection or intellectual supremacy, is controlled by some higher and more vital reality than that of the determinists. We are driven to the conclusion that if the theory of evolution is to include or explain the facts of artistic and spiritual experience, it must be rebuilt on a mental rather than a physical basis.

Even the most ordinary human life includes in its range of fundamental experiences, violent

and unforgettable sensations, forced on us as it were against our will, and for which science finds it hard to account. These experiences and sensations, and the hours of exalted emotion they bring fulfil no office in relation to her pet "functions of nutrition and reproduction." The large place which they fill in the human world of appearance, is a puzzling circumstance for deterministic philosophers who can only escape from the dilemma by calling these things illusions, and dignifying their own more manageable illusions with the title of 'facts'.

Amongst the more intractable of these groups of perceptions and experiences are those we connect with religion, with pain and with beauty. All three, possess a mysterious authority far in excess of those feelings, arguments, or appearances they may happen to contradict. If the universe of the naturalists were true, all three would be absurd and never treated with reverence by the best minds.

Religions

I need not point out the hopelessly irrational character of all great religions: which rest, one and all, on a primary assumption that can never be intellectually demonstrated, much less proved: the assumption that the supra-sensible is somehow important and real, and is intimately connected with the life of man. This fact has been incessantly dwelt upon by its critics. Yet religion pushing to extremes that general dependence on faith which we saw to be an inevitable condition of our lives, is one of the most universal and in-eradicable functions of man, although it constantly acts detrimentally to the interests of his merely physical existence, and opposes "the exclusive action of the will-to-live," except in so far as that will aspires to eternal life. Evolutionarily it begins as magic; it ends as Pure Love. Why did the Cosmic Idea elaborate this religious instinct, if the construction put upon its intentions by the determinists be true?

The Problem of Suffering

The mental anguish and physical pain appear to be the inevitable result of the steady operation of "natural law" and its voluntary assistants, the cruelty, greed, and injustice of man. Here, it is true, the naturalist can point to some amongst the cruder forms of suffering which are clearly useful to the race: punishing us for past follies, spurring to new efforts, warning against future infringements of "law." But he forgets to explain how it is that the Cosmic Idea involves the long torments of the incurable, the tortures of the innocent, the deep anguish of the bereaved, the existence of so many gratuitously agonizing forms of death. Also there is the stranger fact that man's capacity for suffering tends to increase in depth and subtlety with the increase of culture and civilization, even more mysterious, it seems that some have accepted it eagerly and willingly. They have found in Pain, the grave but kindly teacher of immortal secrets, the conferrer of liberty, even the initiator into amazing joys.

Those who "explain" suffering as the result of nature's immense fecundity, a by-product through which the fittest tend to survive, forget that even were this valid and complete, it would leave the real problem untouched. The question is not, whence come those conditions that provoke in the self the experiences called sorrow, anxiety, pain but, why do these conditions *hurt* the self? The pain is mental; a little chloroform, and though the conditions continue unabated the suffering is gone. Why does full consciousness always include the mysterious capacity for misery as well as for happiness—a capacity that seems at first sight to invalidate any conception of the Absolute as Beautiful and Good? Why does evolution, as we ascend the ladder of life, enhance rather than diminish the capacity for useless mental anguish, for long, dull torment, bitter grief? Why, when so much lies outside our limited powers of perception, when so many of our own most vital functions are unperceived by consciousness, does suffering of some sort form an integral part of the experience of man? For utilitarian purposes acute discomfort would be quite enough; the Cosmic Idea, as the determinists explain it, did not really need an apparatus which felt all the throes of cancer, the horrors of neurasthenia,

the pangs of birth. Still less did it need the torments of impotent sympathy for other people's irremediable pain the dreadful power of feeling the world's woe. We are hopelessly over-sensitized for the part science calls us to play.

Pain, however we may look at it, indicates a profound disharmony between the sense-world and the human self. Pessimist and optimist here join hands. But whilst the pessimist, resting in appearance, only sees "nature red in tooth and claw" offering him little hope of escape, the optimist thinks that pain and anguish, which may in their lower forms be life's harsh guides on the path of physical evolution, in their higher and apparently "useless" developments are her leaders and teachers in the upper school of Supra-sensible Reality. He believes that they press the self towards another world, still "natural" for him, though "supernatural" for his antagonist, in which it will be more at home. Watching life, he sees in Pain the complement of Love: and is inclined to call these the wings on which man's spirit can best take flight towards the Absolute. A Kempis calls suffering the "gymnastic of eternity," the "terrible initiative caress of God"; recognizing in it a quality for which the disagreeable rearrangement of nerve molecules cannot account. Sometimes, in the excess of his optimism, he puts to the test of practice this theory with all its implications. Refusing to be deluded by the pleasures of the sense world, he accepts instead of avoiding pain, to becomes an ascetic. The convinced naturalist falls back upon contempt, that favourite resource of the frustrated reason, and can only

regard him as diseased.

Pain plunges like a sword through creation, leaving on the one side cringing and degraded animals and on the other heroes and saints. It is one of those facts of universal experience that is peculiarly intractable from the point of view of a merely materialistic philosophy.

Music and Poetry

The qualities of beauty and of rhythm, the evoked sensations of awe, reverence, and rapture, are almost as difficult to account for. The question *why* an apparent corrugation of the Earth's surface, called for convenience' sake an Alp, coated with congealed water, and perceived by us as a snowy peak, should produce in certain natures acute sensations of ecstasy and adoration, why the skylark's song should catch us up to heaven, and wonder and mystery speak to us alike in "the little speedwell's darling blue" and in the cadence of the wind, is a problem that seems to be merely absurd, until it is seen to be insoluble. We know not why "great" poetry should move us to unspeakable emotion, or a stream of notes, arranged in a peculiar sequence, catch us up to heightened levels of vitality: nor can we guess how a passionate admiration for that which we call "best" in art or letters can possibly contribute to the physical evolution of the race.

Here it is that we approach that attitude of the self, that point of view, which is loosely and generally called *mystical.* Here, instead of those broad blind alleys which philosophy showed us, a certain type of mind has always discerned three straight and narrow ways going out towards the Absolute: in religion, in pain, and in beauty. In many other apparently useless peculiarities of the empirical world and of the perceiving consciousness, some people insist that they recognize at least the fringe of the real. Down these three paths, as well as by many another secret way, they claim that news comes to the self concerning levels of reality which in their wholeness are inaccessible to the senses: worlds wondrous and immortal, whose existence is not conditioned by the

"given" world. Hegel, who, though he was no mystic, had a touch of that mystical intuition which no philosopher can afford to be without, said "Beauty is merely the Spiritual making itself known sensuously." In the good, the beautiful, the true," says Rudolph Eucken, "we see Reality revealing its personal character. They are parts of a coherent and substantial spiritual world." Here, some of the veils of that substantial world are stripped off: Reality peeps through and is recognized, dimly or acutely, by the imprisoned self.

Récéjac only develops this idea when he says "If the mind penetrates deeply into the facts of aesthetics, it will find more and more, that these facts are based upon an ideal identity between the mind itself and things. At a certain point the harmony becomes so complete, and the finality so close that it gives us actual emotion. The Beautiful then becomes the sublime; brief apparition, by which the soul is caught up into the true mystic state, and touches the Absolute. It is in this sense also that "beauty is truth, truth beauty".

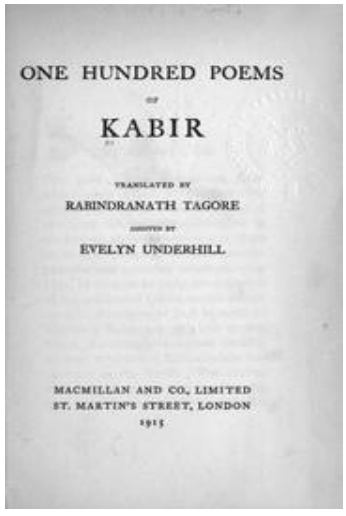
"Of Beauty," says Plato in an immortal passage, "I repeat again that we saw her there shining in company with the celestial forms; and coming to earth we find her here too, shining in clearness through the clearest aperture of sense. For sight is the most piercing of our bodily senses: though not by that is wisdom seen; her loveliness would have been transporting if there had been a visible image of her, and the other ideas, if they had visible counterparts, would be equally lovely. But this is the privilege of Beauty, that being the loveliest she is also the most palpable to sight. Now he who is not newly initiated, or who has been corrupted, does not easily rise out of this world to the sight of true beauty in the other. . . . But he whose initiation is recent, and who has been the spectator of many glories in the other world, is amazed when he sees anyone having a godlike face or form, which is the expression of Divine Beauty; and at first a shudder runs through him, and again the old awe steals over him. . . ."

Most men in the course of their lives have known such Platonic hours of initiation, when the sense of beauty has risen from a pleasant feeling to a passion, and an element of strangeness and terror has been mingled with their joy. In such moods of heightened consciousness each blade of grass seems fierce with meaning, and becomes a well of wondrous light: a "little emerald set in the City of God." The seeing self is indeed an initiate thrust suddenly into the sanctuary of the mysteries: and feels the "old awe and amazement" with which man encounters the Real. In such experiences, a new factor of the eternal calculus appears to be thrust in on us, a factor which no honest seeker for truth can afford to neglect; since, if it be dangerous to say that any two systems of knowledge are mutually exclusive, it is still more dangerous to give uncritical priority to any one system.

Why, after all, take as our standard a material world whose existence is affirmed by nothing more trustworthy than the sense-impressions of "normal men"; those imperfect and easily cheated channels of communication? The mystics have never been deceived by phenomena, nor by the careful logic of the industrious intellect. One after another, with extraordinary unanimity, they have rejected that appeal to the unreal world of appearance that is the standard of sensible men: affirming that there is another way, another secret, by which the conscious self may reach the actuality which it seeks. They accept as central for life, those spiritual messages which are mediated by religion, by beauty, and by pain and find in that very hunger for reality, the mother of all metaphysics, an implicit proof that such reality exists beyond the ceaseless stream of sensation which besieges consciousness. "In that thou hast sought me, thou hast already found me," says the voice of Absolute Truth in their ears. This is the first doctrine of mysticism. Its next is that only in so far as the self is real can it hope to know Reality: like to like speaks: *Cot ad cot loquitur*. Upon the propositions implicit in these two laws the whole claim and practice of the mystic life depends.

In this seeking we are not wholly dependent on that homing instinct. For some, who have climbed to the hill-tops, that city is not really out of sight. The mystics see it and report to us concerning it. Science and metaphysics may do their best and their worst: but these pathfinders of the spirit never falter in their statements concerning that independent spiritual world which is the only goal of "pilgrim man." They say that messages come to him from that spiritual world, that complete reality which we call Absolute. We are not, after all hermetically sealed from it. To all who will receive it, news comes of a world of Absolute Life, Absolute Beauty, Absolute Truth, beyond time and place: news that most of us translate—and inevitably distort in the process—into the language of religion, of beauty, of love, or of pain.

Possible knowledge need not be limited to sense impressions, to any process of intellection, or to the unfolding of the content of normal consciousness. Such diagrams of experience, it says, are hopelessly incomplete. The mystics find the basis of their method not in logic but in life: in the existence of a discoverable "real," a spark of true being, within the seeking subject, which can, in that ineffable experience which they call the "act of union," fuse itself with and thus apprehend the reality of the sought Object. In theological language, their theory of knowledge is that the spirit of man, itself essentially divine, is capable of immediate communion with God, the One


ONE HUNDRED POEMS
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KABIR
TRANSLATED BY
RABINDRANATH TAGORE
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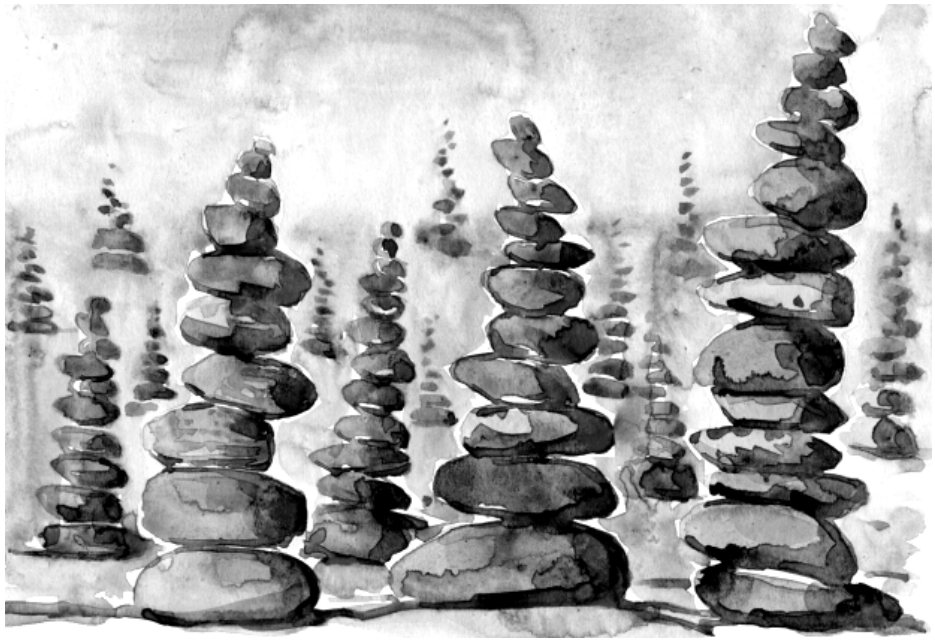
Reality.

Where the philosopher guesses and argues, the mystic lives and looks; and speaks, consequently, the disconcerting language of first-hand experience, not the neat dialectic of the schools. Hence whilst the Absolute of the metaphysicians remains a diagram—impersonal and unattainable—the Absolute of the mystics is lovable, attainable, alive. "Oh, taste and see!" they cry, in accents of astounding certainty and joy. "Ours is an experimental science. We can but communicate our system, never its result. We come to you not as thinkers, but as doers. Leave your deep and absurd trust in the senses, with their language of dot and dash, which may possibly report fact but can never communicate personality. If philosophy has taught you anything, she has surely taught you the length of her tether. One after another, idealists have arisen who, straining frantically at the rope, have announced to the world their approaching liberty; only to be flung back at last into the little circle of sensation. But here we are, a small family, it is true, yet one that refuses to die out, assuring you that we have slipped the knot. This is evidence which you are bound to bring into account before you can add up the sum total of possible knowledge; for you will find it impossible to prove that the world as seen by the mystics, 'unimaginable, formless, dark with excess of bright,' is less real than that which is expounded by the youngest and most promising demonstrator of a physicochemical universe. Examine us as much as you like: our machinery, our veracity, our results. We cannot promise that you shall see what we have seen, for here each man must adventure for himself but we defy you to stigmatize our experiences as impossible or invalid. Is your world of experience so well and logically founded that you dare make of it a standard? Philosophy tells you that it is founded on nothing better than the reports of your sensory apparatus and the traditional concepts of the race. Certainly it is imperfect, possibly it is illusion, it never touches the foundation of things. Whereas 'what the world, which truly knows nothing, calls "mysticism" is

the science of ultimates, . . . the science of self-evident Reality, which cannot be "reasoned about," because it is the object of pure reason or perception.'"

(Edited by Jackie Bortoft. An expanded version of this article is available at:
http://www.sacred-texts.com/myst/myst/myst04.htm
This is a chapter from her seminal book: Mysticism published in 1911)

Evelyn Underhill *(6 Dec.1875 – 15 June 1941) was an English Anglo-Catholic writer and pacifist known for her numerous works on religion and spiritual practice, in particular Christian mysticism. In the English-speaking world, she was one of the most widely read writers on such matters in the first half of the 20th century. No other book of its type—until the appearance in 1946 of Aldous Huxley's The Perennial Philosophy—met with success to match that of her best-known work, Mysticism, published in 1911.*



(Stone towers land art)

A PILGRIM'S PATH

SATISH KUMAR

Life is a pilgrimage; a sacred journey in the quest for wisdom. But wisdom is not a thing to be found or a destination to be reached. Wisdom is an ever unfolding and ever emerging experience. A pilgrimage is as much an outer journey as it is an inner journey. When we are able to connect the inner landscape with the outer landscape, we are in the proximity of wisdom.

A pilgrim's path is not paved with concrete. A pilgrim doesn't follow a fixed agenda or a rigid plan. A pilgrim does not and cannot determine the outcome of the pilgrimage. A sacred journey is an unfolding process rather than a pre-determined produce.

A pilgrim is resilient, strong, humble and open to whatever comes along the way. This uncertainty and ambiguity is a friend of the pilgrim, who is free from fear and filled with trust in the process of the universe. Who knows what is in store for a pilgrim? Miracles can and do happen when we are able to embrace the unknown with pure heart and radiant spirit.

A pilgrim welcomes any obstacles, any difficulties, any problems along the path. Many such pilgrims have gone through the dark night of the soul and come out the other end into the dawn of delight and peace.

This state of freedom from desires and attachments brings an end to all sorrows and suffering. Such a state is available at every step and every moment. The path, the pilgrim and the journey are all one. This unity, this integrity brings stillness in the movement and movement in the stillness. There is no goal, there is nothing to achieve. There is nowhere to reach. The path and the journey in themselves have their own intrinsic value.

The earth is on a journey, the moon is on a journey, the birds are flying, the bees are buzzing, pilgrims are walking. This, is to be dynamic, creative, imaginative, poetic and active for its own sake. The joy and bliss are not at the point of arrival; the sweet taste of freedom is at every step, in every moment, in the here and now. This is the Tao of being, the Zen of the art of living and a grateful way of walking in the happy country.

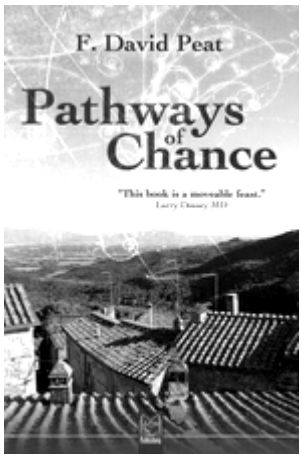
A pilgrim expects nothing and accepts everything. Where there is no expectation there is no disappointment. Where there is unconditional acceptance there is joy. A pilgrim walks the path of love and experiences transformation.

As Jalal as-Din Rumi said:

By love the bitter becomes sweet;
By love copper becomes gold;
By love cloudy becomes clear;
By love pains become healing.

Satish Kumar *has been the Editor of Resurgence& Ecologist magazine since 1973. His autobiography* ***No Destination*** *is published by Green Books.*

www.resurgence.org



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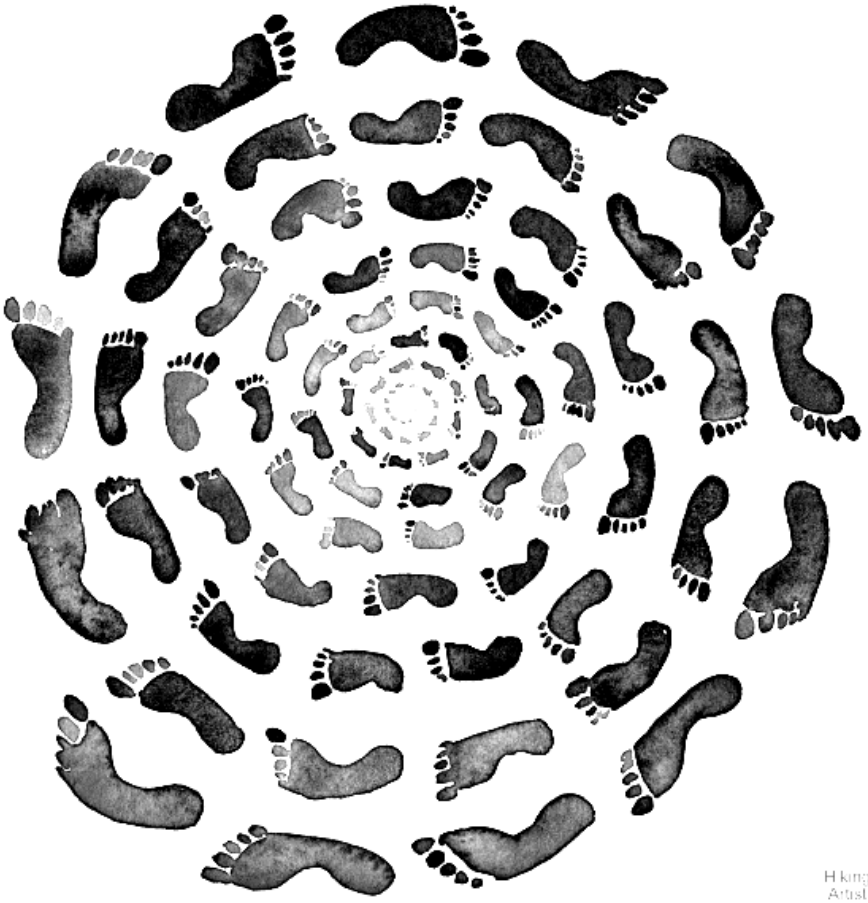

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Wisdom is humble that it knows no more.

William Cowper

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