

Sustainability of the Fitting – bringing the philosophical principles of natural inclusion into the educational enrichment of our human neighbourhood

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Abstract

Learning is an evolutionary process that enables us to develop the abilities necessary to sustain our lives in a complex, changing world. The way that educators understand this process is liable to affect their practice in very fundamental ways. Where they follow an ‘adaptive’ evolutionary model, their practice is likely to be highly prescriptive, with specific ‘aims’ and ‘objectives’ defined by fixed standards and criteria for ‘success’ and ‘failure’. Such practice is, however, likely only to prepare learners *instrumentally*, for success in the short term, whilst imposing sharp restrictions upon the *inspirational* qualities needed to nurture their capacity for imaginative and coherent thought, curiosity and natural creativity for the long run. Moreover, it is liable to instill and reinforce a competitive, intolerant and materialistic ethos that militates both against any feeling of community belonging and against acceptance of individual or collective diversity and vulnerability. By contrast, a natural inclusional evolutionary understanding *reveals* scope for a more comprehensive, less hard-line improvisational educational practice, through recognition of the continuous, receptive presence of space everywhere. This practice effectively combines directional *focus* with all-round *circumspection*. It is both instrumental and inspirational in encouraging co-creative learning in diverse communities with fluidly tolerant and versatile qualitative and quantitative guidelines for evaluation of open-ended learning processes.

Foreword – Discovering My Hidden Kinship

Before I say anything else, I want to express my delight and gratitude in being invited here to contribute to a co-evolving educational scene that only ten years ago I didn't know existed. Back then, as a biological and ecological scientist with what I have come to recognize as a poetic soul and cavernous self-doubt, I was struggling to reconcile my passion and compassion for our natural human neighbourhood with the stridency of ultra-Darwinian, mechanistic and solely quantitative approaches to research and teaching that I am surrounded by to this day. This stridency was matched by an academic and political culture that worshipped competitiveness and economic enterprise, whilst despising and/or patronizing whatever it saw as human 'weakness', 'softness' or 'wetness'. I felt very lonely and useless and I broke. But as the mists began to clear, and I started to wander beyond the retaining walls of my academic discipline, I encountered voices suggesting that I was not quite as alone as I thought. There was a world of action research and self-inclusive participatory practice that corresponded closely with what I dearly wanted to communicate to my students and colleagues. This world was full of unfamiliar language and references to concepts and people I had never heard of in my closeted former life. But I felt I could see through this outer appearance to something deeply in common. One member of this world seemed to see the same possibility through my camouflage. He suggested we might learn something from one another through active engagement in each other's 'embodied knowledge' about what kind of influence embraced us both. He felt I had an original insight into the nature of that influence, which radically transformed his way of thinking. Maybe we could help each other to communicate about and spread that influence. Tough nut as he is, he signed his messages with 'Love'. So, here I am, hoping to help spread that influence in an original, honest, insightful and imaginative if not painless way. As I will explain more fully later, I do so not with the intention of providing a 'course of instruction' or 'persuasion', but by revealing what makes natural sense to me in the hope of opening up possibilities for others to consider and reflect upon from the perspective of their personal experience.

Introduction – The evolutionary nature of learning

My intention in this paper is to explore the ways in which our understanding of the process of learning – and how this process can be instigated and/or assisted educationally – is related to the way we understand evolutionary processes. Indeed, it

has been through just such an exploration that my scientific background as a biologist and ecologist has reached into my personal pedagogical practice as a University teacher and *vice versa*. As a biologist and ecologist, I have been interested in how life forms simultaneously relate to and transform their habitat, in much the same way that a river system both shapes and is shaped by the landscape in and through which it flows. As an educator I have been concerned about how the quality of my pedagogy both influences and is influenced by the way students respond to what I offer them by way of both factual knowledge and imaginative and coherent understanding.

Learning entails the development of abilities that can sustain, transform and enrich our lives in a huge variety of ways. These abilities do not come to us pre-packaged and so can only be developed through our own and others' current and previous experience. As such, learning is clearly an evolutionary process of vital importance to the continuity and quality of human life. It also has the potential to bring pleasure and reward in its wake. Whether this potential is fulfilled, however, depends profoundly on *what* is learned, *why* it is learned and *how* it is learned, which depends in turn on the underlying evolutionary paradigm that is being followed and what assumptions this paradigm is based upon. If the underlying paradigm is flawed in some way, the experience may be anything but pleasurable and rewarding – at least not for the majority of those involved in the process. Just such painful personal experience, both as a student and teacher, has led me to enquire into the assumptions upon which current evolutionary and pedagogical paradigms are predominantly based. This enquiry has in turn led me, with the help of a few others, to seek and develop a new and to my mind more realistic understanding of evolutionary processes based on what I have called 'natural inclusion' as *the co-creative, fluid dynamic transformation of all through all in receptive spatial context* (Rayner 2006, 2007, 2008a,b).

I think that an appreciation of natural inclusion can bring about a radical involution in our educational approach and priorities that is consistent with the insights of living theory action research pioneered and described by Whitehead & McNiff (2006). But before I explore the meaning and evolutionary implications of natural inclusion in more depth and detail, I wish to reflect on both the strengths and shortcomings of selective models, epitomized by the notion of 'survival of the fittest' or 'preservation of favoured races in the struggle for life' (Darwin, 1859). Natural inclusion does not

entirely extinguish and replace these selective models, which I think are based on a simplistic and damagingly misleading assumption that is nonetheless partially true. Rather, natural inclusion embraces, deepens and transforms the partial truth of selective models within the context of what I think is a more comprehensive and coherent understanding of evolutionary processes (Rayner 2004). This new understanding is founded in the post-dialectic *fluid boundary logic* of ‘natural inclusionality’ and *fluid transfigural logic* of transfigural mathematics, which recognise all natural form as *flow-form*, an energetic configuration of space in figure and figure in space (Shakunle and Rayner, 2009). Correspondingly, this logic moves on from opposing ‘one’ against ‘other’ or ‘many’ through their mutual exclusion of space to *including each in the reciprocal dynamic influence of the other* through their mutual inclusion in and of space (Whitehead and Rayner, 2009). It arises not from the *addition* of some new *connective construct* to currently predominant modes of thought in order to integrate everything into a continuous ‘whole’, but through the *revelation* of what is, always has been and always will be *present*, by way of *receptive and transfigural* space. The treatment of this vital and truly continuous presence as a physical absence or ‘void nothingness’ is at the root of the paradoxical inconsistencies of abstract rationality that have dogged our understanding of evolutionary processes.

Adaptive Learning and Evolution

The relationship between organism and world is of critical philosophical, psychological and biological importance, but has always been open to diverse interpretations (Rayner and Jarvilehto, 2008). In selective evolutionary models, the world, habitat or environment is treated as no more than a source of stimuli or collection of factors that direct the organism’s adaptive response. Learning is correspondingly interpreted as a product of interaction between two mutually exclusive systems, the organism as an autonomous or autopoietic, self-enclosed or enclosing system and the environment as its external hinterland. This purely interactive (action and reaction-based) view is evident even in some of the most non-reductive and recently developed models of self-identity and consciousness (e.g. Varela et al., 1991; Di Paolo, 2005; Thompson, 2007; Barbieri, 2007; Hutchins, 1995; Laland et al., 2000).

Deep in the foundations of selective models is the assumption of absolute discontinuity between a 'figure', as a material and/or energetic form or body, and 'space', as the figure's contextual 'ground'. Whereas 'figures' are treated literally as definitively observable and quantifiable entities, space is treated either as a passive physical absence – i.e. a void 'nothingness', or as fixed three-dimensional reference frame or dynamic *surface*. According to Einstein's General Relativity, the intensity of curvature of the latter 'tells matter how to move' (as John A. Wheeler has famously put it), while itself being determined by the mass occupying it in an ongoing dialectic of counteractive agencies. Either way, the boundaries of organisms, worlds and their contents are treated as discrete, fully definable limits, not – as in natural inclusionality and transfigurality - dynamic relational interfacings between truly *continuous* [i.e. not just adjacent or *contiguous*] inner and outer spatial realms (cf. Rayner, 1997, 2000).

The following simple exercise might help you appreciate the difference between the hard-line, space-cutting view of discontinuous models and fluid-line understanding of natural inclusionality and transfigurality. Draw an outline of two figures using a dotted line on a plain sheet of paper. The 'paper' stretched to infinity would represent what in the transfigural geometry developed by Lere Shakunle is called 'Omni-space' (Shakunle and Rayner, 2008b, 2009). The space within each figure represents 'Intra-Space', the space between figures 'Inter-space' and the space transcending the figures' permeable and dynamic boundaries 'Trans-Space'. You can see how the continuous non-local space everywhere (omni-space') is locally configured into distinctive, but *not discrete* regions. In the way that you have drawn them, the figures are not contiguous (connected), and so their 'intra-spaces' can only communicate through the 'inter-space' and 'trans-space' between and permeating their boundaries as *energetic interfacings* and *restraining influences* (not *restrictive material definitions* or external *forces* – see later). Nonetheless, they still inhabit the same limitless pool of omni-space everywhere. If you were now to draw the figures closer together, so that their boundaries connect and coalesce at one or more points, their intra-space now becomes continuous (cf. Fig. 1). On the other hand, if you were to take a pair of scissors and cut around the dotted lines, the figures will drop out of their spatial context as discontinuous individual entities. This is what discontinuous models of reality effectively do – they treat boundaries as cut-out zones between discrete inner realms

and outer realms, instead of dynamic relational interfacing through which these realms remain continuous through trans-space.

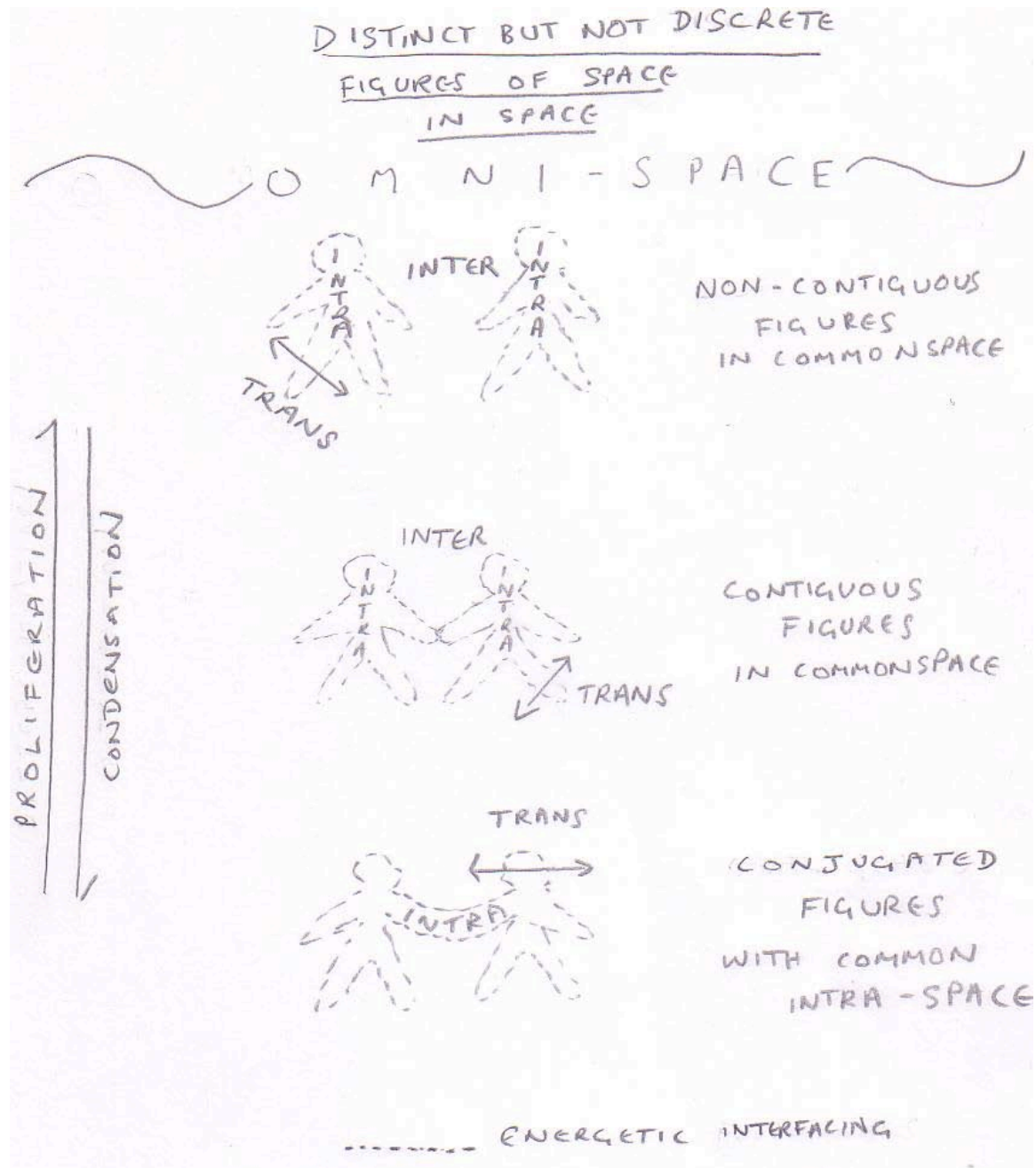


Figure 1. Figures of Space (Pencil sketch by Alan Rayner, 2010). This sketch illustrates the dynamic relationships between figural flow-forms as energetic configurations of space in figure and figure in space. It also serves to distinguish the natural inclusional dynamic relationship between distinct but not discrete flow-forms both from reductive schemas that cut off inner from outer spatial realms and from connectivistic and wholistic schemas where individual dynamic locality is eschewed from a seamless, purely figural whole. Since the cartoons can only represent an instantaneous 'slice' through the figures, the dotted lines shouldn't be taken to

represent 'sieves' but more the seething 'fluid mosaic' that constitutes real biological membranes (as well as all kinds of other 'surfaces' that appear smooth, fixed and complete from afar, but are revealed as fluidly energetic with closer inspection - like the sea viewed from the perspective of an astronaut and a swimmer). A very simple example of what is represented in the cartoon can also be seen between surface-tense droplets of water condensing on a surface. As they expand and come into proximity their tensely curved inner-outer interfacings first touch and then coalesce in a visible rush as each flows reciprocally into the other and the tension of their boundaries is released (Aaaaaaah!).

Meanwhile, no sooner is the dichotomy (cut-off) between organism and world as separate *whole* systems presupposed, than the scene is set for belief in an oppositional relationship between the two, whereby the genetic 'nature' of the 'one' is confronted by and required to adapt to the constraint (or, more optimistically, 'nurture') imposed by the 'other'. The outer world takes on the role of 'teacher', 'parent', 'school' or 'niche', whose exacting standards the inner world of organism has to comply with in the role of 'student' or 'offspring' if it is to be given the chance to continue. Where there are many such 'students' they are required to compete in a testing regime for the favour of the 'teacher' (in this case, the environment), which is only afforded to those at 'the top of their class'.

The incorporation of such thinking into modern human culture and the education systems through which it self-perpetuates is manifest in the familiar hierarchical class categorizations, power relations, conflicts and discriminatory practices that have spread globally. Virtually nowhere is the assumption questioned that competition brings out the 'best performers', whether amongst us human beings, or in Nature in general. There is, however, some recognition that competition can also bring out the 'worst' of us, by way of intransigent and reactionary traits of selfishness, enmity, dishonesty, arrogance, greed, insensitivity and cruelty. For example, appalled by the implications of his belief in Darwinian selection, Richard Dawkins (1989) has gone so far as to exhort: 'Let us try and *teach* generosity and altruism, because we are born selfish'! But I think that the real problem arises from continuing to teach ourselves to assume that we are born selfish, at the same time as using our mortal fear of annihilation as the primary motivation for learning the instrumental means of gaining advantage over others in order to protect the 'self-interest' that enables us to 'survive'.

I think we need to teach ourselves something that is both more inspiring and closer to the real truth of Nature, which enables us to understand what brings *love and vitality* as well as suffering and death. To do so, however, we will need to loosen some very rigid and deeply embedded practices and beliefs. This loosening will entail more than simply shifting the boundary of definition from Many *individual wholes* to One *group whole* in which all are connected and lose their unique local identity in a webby co-operative mass. Such a holistic move out of the reductive frying pan of fragmentation into the paralysis of all-oneness is based on the same totalizing assumption of material discontinuity from space as that which it sets itself against. Truly to get our selves out of the fix of the totalities we are so prone to trap them within, we will need to change our perception of the natural geometry of space and boundaries from *absolutely fixed* to *variably fluid* – which is the foundation for the natural inclusional understanding of all form as flow-form.

Meanwhile, what is *partially* true about selective models is that where there is simultaneous demand for resources amongst different localities within a finite locality, any disparity between these localities in their acquisitive capacity will enable some, and ultimately one, to overwhelm others. This is the principle upon which notions of competitive exclusion, economic monopoly and social and agricultural monoculture are based. It's also what enables cancerous growth and invasive colonization, as well as such non-biological phenomena as flooding, volcanic eruption and river capture, to occur in the short term and ecological succession to occur in the long run – but these examples themselves provide a clue to the lack of viability of uniformity in the long run.

For any singular identity to be sustained indefinitely within a locality it must either be *entirely* self-contained and independent of others or the conditions and supply of resources that it needs – and to which it is most well-suited – must be constant. But this is not a realistic possibility.

To be entirely self-contained is to be an inert, closed structure with no capacity for take up or loss of energy between inner world and outer world. The nearest any life forms get to this condition is when they form 'survival capsules' such as spores, seeds, pupae and cysts that carry them through lean periods. This is what *real*

biological 'survival' entails. In such a condition they are incapable of *any* growth, let alone competing or co-operating with others. But no sooner is any activity resumed that can support growth, so too is any life form's dependence upon its natural neighbourhood for resource supply and suitable conditions that are liable to change by dint of the activity itself. Such is the truth of the saying that you can't have your cake and eat it!

Hence the inescapable truth is that *the ecological and evolutionary sustainability of natural life forms, from the cells and tissues in a human body to the trees in a forest depend upon the diversity, complementary relationship and changeability of all within their neighbourhood, to which they themselves contribute*. When resources run short they pool and redistribute internal resource supplies within integrated structures and survival capsules – they do *not* compete to proliferate faster on the dwindling supplies than their neighbours. When resources are plentiful they proliferate and differentiate (Rayner 1997, Fig 2.) Moreover, as is beautifully illustrated by the exploratory patterns of some kinds of fungi, this ability to *attune* their capacity to differentiate and integrate activity *in dynamic relationship with energy availability* allows life forms to locate and sustain supplies in a heterogeneous habitat with extraordinary efficiency, though an interdependent *combination* of all- round *circumspection* and directional *focus* (Fig. 3). Correspondingly, if you're one of a group of survivors of a plane crash in a desert, it makes sense for all of you at first to fan out in different directions rather than all make for the same point on the horizon, hoping to find an oasis that way (Rayner 2008b).

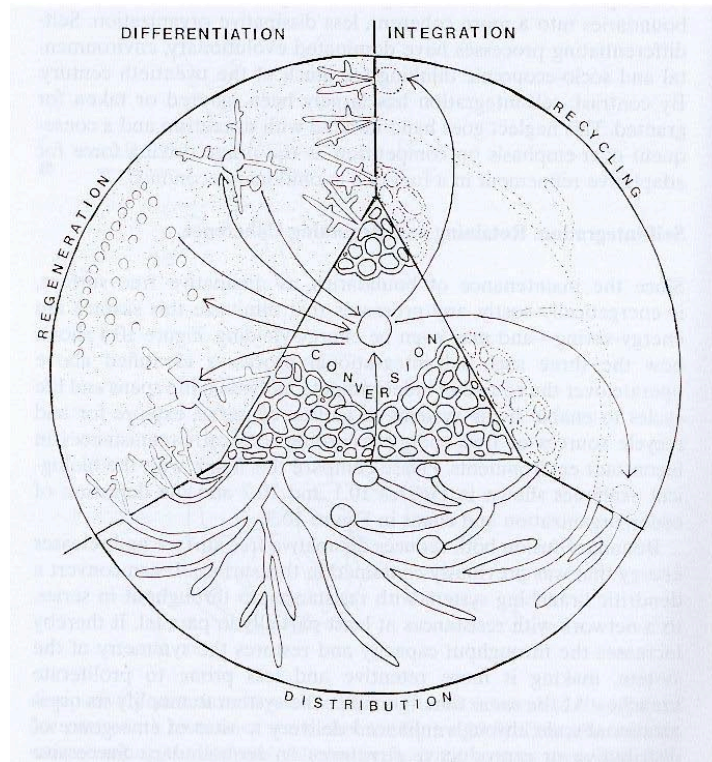


Figure 2. *The interplay between boundary-proliferating ('differentiation') and boundary-condensing ('integration') processes in resource-rich (stippled) and resource-restricted circumstances. This interplay enables energy to be assimilated (allowing regeneration and proliferation of boundaries), conserved (by conversion of boundaries into relatively impermeable form), explored for (through internal distribution of energy) and recycled (via redistribution/reconfiguration of boundaries) in life forms in dynamic relationship with their natural neighbourhood. Thin lines indicate relatively more permeable boundaries, thick lines relatively impermeable boundaries and dotted lines degenerating boundaries. (From Rayner, 1997).*

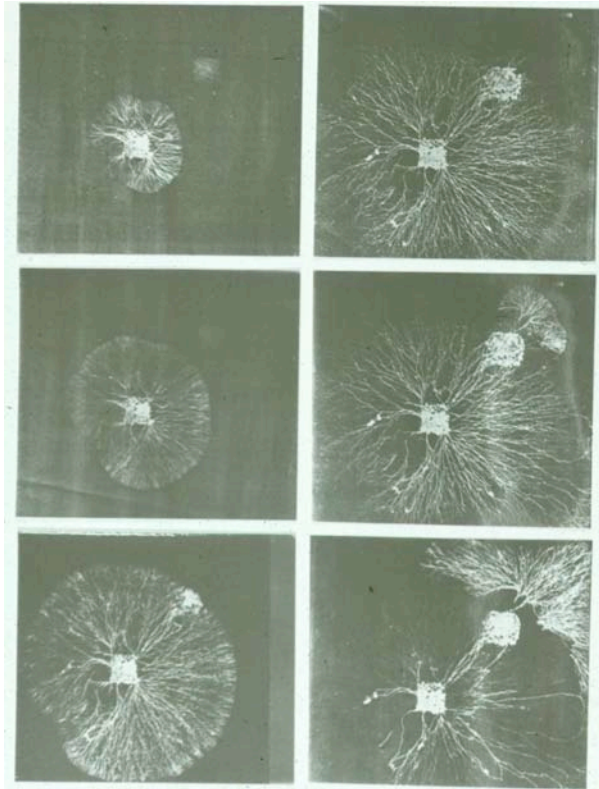


Figure 3. 'Fungal Foraging'. *A fungus finds an oasis in a desert, by fluid-dynamically spreading and narrowing its energetic focus. The wood-decaying fungus, Hypholoma fasciculare, has been inoculated into a tray full of soil on a block of wood ('starter' food source), with an uncolonized wood block ('bait' food source) placed some distance away from it. Distinct stages are shown in the radial spreading of the fungal colony from the inoculated wood block, followed by the redistribution and focusing of its energy in one direction following upon contact with the bait. Similar fluid dynamic patterns of gathering in, conservation of, exploration for and redistribution of energy supplies are found throughout the living world, from subcellular to ecosystem scales of organization (From Dowson et al., 1986; see also Rayner, 1997).*

Correspondingly, any growth that overwhelms what it depends upon isn't sustainable in the long run, no matter how profitable an enterprise it might seem to be in the short term. It seems, however, that selective evolutionary thinkers and their counterparts in government, economics and education aren't capable of combining the circumspection and focus necessary to appreciate these simple biological and ecological truths and their implications. This raises the question of what is getting in

their way. Is there some deficiency in the workman or his tools or both? If so, how can this deficiency be made good, and how might this fundamentally change both our theory and practice? In the following sections I will consider four kinds of barriers to natural inclusional understanding, and how these could be opened up: *mathematical*, *cognitive*, *fearful* and *linguistic*.

Mathematical excommunication – singular numbers, cubical cubicles and depthless surfaces

In spite of and perhaps in some ways because of the advent of quantum mechanics, relativity and non-linear dynamical systems theory, the mathematical logic that imposes discontinuity between definable material figures and empty spatial ground continues to dominate and restrict thinking about evolutionary processes.

Arithmetically, this discontinuity is evident in the treatment of ‘natural numbers’ as exactly definable points along a finite, width-less line. This line begins at a point and ends at a point and so stops short an infinitesimal distance from entering the space beyond the ‘end of the line’, which may be interpreted either as ‘absolute zero’ or as ‘absolute infinity’, depending on ‘which end of the line’ is being considered. This infinitesimal distance is nowadays interpretable in ‘superstring theory’ as a ‘Planck length’ or ‘quark-string’ - but neither of these can in reality be understood as the cut-off point of a singular figure without dropping it out of spatial context (Shakunle and Rayner, 2008a).

The upshot is that space is excluded from all numbers that can amount to anything, and so is treated as a purely external, empty and passive void. Only explicitly definable material forms can be *quantified* – counted and accounted for in this schema. Nature is treated as though it is constructed solely from discrete, absolutely discontinuous units – isolated entities or independent singularities. This begs the question of how these completely self-contained entities can move or change, given that by definition they cannot assimilate or emanate energy. With spatial communication channels materially blocked off, they either have to find the necessary *force* entirely within themselves as some kind of wilful free agency whose ultimate source or ‘first cause’ is unknowable, or outside of themselves in a power beyond definition and scrutiny. To rely on this inscrutable external or internal ‘driver’ as an

explanatory principle can neither make sense, nor is it sustainable, because the power itself is necessarily consumed in the process of movement or change.

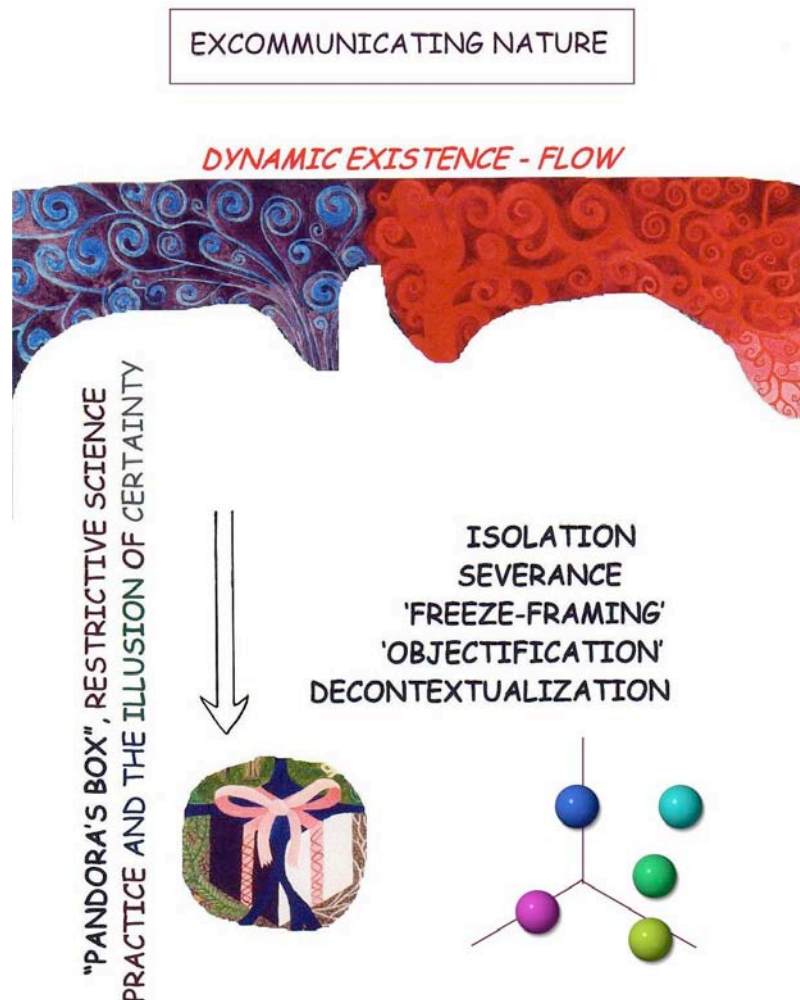


Figure 4. *How mathematical abstraction imposes discrete limits upon natural energy flow, thereby fixing what is dynamically continuous and without spatial limit either within three-dimensional cubical cubicles or upon the depthless surface of spheres*

The way in which structure is paradoxically both abstracted from and used to define space is also apparent in the framing of nature within an infinitely extended cubical box with a fixed centre but no outside. This is the basis for the idealistic geometry of Euclid, which paradoxically localizes the infinite (i.e. ‘non-local’ in the sense of ‘present everywhere’ or ‘omnipresent’) receptive presence of space within just three structural planes set at right-angles to one another. Through this geometry, space, time

and structure are conveniently homogenized in a way that enables them to be packaged and quantified in independent, uniformly linear units that can be added, subtracted, divided and multiplied as whole entities and fractions according to the rules of elementary arithmetic (cf. Fig.4).

Even Riemannian and Lobachevskian non-Euclidean geometries do not escape this spatial restriction and associated material discontinuity in that they are confined to a *depthless curved surface*. Moreover, fractal geometry and the associated ‘strange attractors’ of chaos theory actually originate in the subdivision of a pre-imposed rectilinear and discrete geometrical and numerical framework, even though they are vaunted as a departure from conventional mathematics (Mandelbrot, 1977; Gleick, 1988). Being based on non-linear processes, they are more representative of nature and do display some of the characteristics implicit in the dynamic inclusion of space, but they *begin* with the abstract localization of initial conditions and structural limits instead of allowing local form to configure dynamically within a non-local spatial context (Rayner, 2004).

The fixed geometrical and numerical framework of conventional mathematics that has become so unquestionable as a rigorous thinking tool was no doubt greatly reinforced by the apparent predictive success of Newtonian mechanics in describing the world as a set of moving whole bodies separated by empty space. According to this schema, all movement, or acceleration, deceleration or redirection of movement is measurable in accordance with fixed time intervals and attributable to calculable external force. Step-by-step, straight-line, sequential motion (linearity) is given precedence over curvature (non-linearity) and gravity assumed to be a property of mass alone. And yet, as Newton (1687) himself admitted: ‘I wish we could derive the rest of the phaenomena of nature by the same kind of reasoning from physical principles; for I am induced by many reasons to suspect that they all may depend upon certain forces by which the particles of bodies, by some causes hitherto unknown, are either mutually impelled towards each other, and cohere in regular figures, or are repelled and recede from each other; which forces being unknown, philosophers have hitherto attempted the search of nature in vain; but I hope the principles laid down will afford some light either to this or some truer method of philosophy’.

In truth, having reduced nature into neat discontinuous rectilinear packages, or dimensionless point masses stuck to a curved surface, it is impossible to regain natural continuity without implicitly re-including the space that was removed for the sake of arithmetic convenience in the first place. It doesn't necessarily follow that what can be *derived* locally from a continuous energy flow is actually what the flow is made of, like a set of building blocks, as distinct from what the flow can make. The *pretence* that it is possible, as in calculus, to reconstruct natural flow from elementary discrete units is at the heart of the paradoxes of completeness that bedevil rationalistic argument and conventional mathematical 'proofs' (Rayner, 2004; cf. Hofstadter, 1980).

Correspondingly, a contiguous (i.e. *interconnected*) series of freeze-frames, as in a cine film, can only give the *illusion* of the original continuous movement, and yet our orthodox approach has made us unable to describe movement in any other way than by means of reducing it to successive locations in an abstract reference frame, as when we plot graphs and use differential calculus. The freeze-frames are abstractions from, not ingredients of the original. It may be mathematically convenient to reduce our selves and others to fit into the freeze-frames of discrete numerical statistics, but it grossly demeans the creative potential of our real life. It reifies the dichotomies between One and Other and One and Many that set the scene for conflict and cruelty to replace care and compassion by fixing the centre of self at the centre of all.

Now for the cognitive barrier.

Nature Beyond Definition: overcoming the cognitive illusion and fearful desire of organism-environment discontinuity

Getting Stuck

There is good reason to think that as terrestrial, omnivorous, bipedal primates unable to digest cellulose but equipped with binocular vision and opposable thumbs that enable us to catch and grasp, we are predisposed to view the geometry of our natural neighbourhood in an overly definitive way (Fig. 5). We see the world in terms of what it can do for us and to us as alienated observers or *abstracted* 'exhabitants', not how

we are inextricably involved in it as *natural inhabitants*. We see ‘boundaries’ as the limits of definable ‘objects’ and ‘space’ as ‘nothing’ – a gap or absence outside and between these objects (Rayner, 2004). We see the figure but overlook the spatial ground. But what a disaster it would be for us if Nature did the same!



Figure 5. ‘Arid Confrontation’ (Oil painting on board by Alan Rayner, 1973). *This painting, made when depressed after a year of postgraduate research, depicts the limitations of the detached view of the observer excommunicated from nature. After a long pilgrimage, access to life is barred from the objective stare by the rigidity of artificial boundaries. A sun composed of semicircle and triangles is caught between straight lines and weeps sundrops into a canalized watercourse. Moonlight, transformed into penetrating shafts of fear encroaches across the night sky above a plain of desolation. Life is withdrawn behind closed doors.*

Such fixed geometric representation of space and boundaries is not only inconsistent with but also greatly diminishes our understanding of natural fluidity. Like Shakespeare’s Hamlet, we inaptly regard this fluidity as ‘the slings and arrows of outrageous fortune (i.e ‘chance’) or a chaotic ‘ sea of troubles’ to ‘to take arms against... and by opposing end them’. To avoid this logical trap of ‘to be or not to

be’, and its associated conflicts and cruelties, we need to understand how its foundational premises have become enshrined in the mathematical underpinning of objectivist science, and how these can be questioned and realistically transformed.



Figure 6. ‘Future Present’ (oil painting on canvas by Alan Rayner, 1999/2000). *Natural diversity in fluid linings, beyond categorical definition. The painting portrays how, through natural inclusionality and transfigurality, we can understand the ‘present’ as a dynamic inclusion of ‘past’ in the coming of ‘future’, not as an abstract discontinuity between one and the other. Every local figure or moment is understood in fluidly continuous instead of static dissected terms. The painting also depicts the problems of ‘genetic determinism’, whereby the diversity of organic life on Earth is misintepreted in abstract ‘black and white’ terms as the product of ‘building blocks’ of DNA instead of an expression of nature in embodied water flow. (Please compare with Figure 4).*

Several lines of theoretical and empirical research inferring interconnectedness or material-energetic linkage between organism and world have themselves opposed the kind of thinking that opposes what is within a ‘figure’ to the contextual ‘ground’ outside the figure. Dewey (1922) regarded human action as a system that always

involves both parts of the body and environment and replaced the concept of organism-environment interaction with the concept of “transaction” stressing the *simultaneous* role of organismic and environmental constituents in behavior. At the same time, in biology, Uexküll (1932) developed Kantian ideas, stressing the connection between the organism and environment, and dividing the latter into two parts: die Umgebung or detached ‘objective nature’ and die Umwelt, as experienced environmental parts involved in the “Funktionskreis” connecting inner world and outer world. Meanwhile, although physiological processes were generally considered as something happening inside the organism, Haldane (1917) pointed out that the ‘respiratory system’ may only be conceived as a ‘system’ only if no border is set between the “inner” and “outer” air. A logical deduction was that all organisms belong together and a single organism is only some kind of a knot in a material web of life – a notion that has become central to modern holistic thinking, popularized by Capra (1996, 2002), Kumar (2002) and Laszlo (1996), amongst many others. Others who have followed this path of connectivism include Sumner (1923), Bentley (1941) Mead (1934), Angyal (1941), Lehrman (1953), Gibson (1979), Lee, (1994), Palmer (2004), Bickhard (1999), and Still and Good (1992).

Gibson (1979), in his ecological psychology, coined the term “affordance”, referring to both the environment and the animal, which is implicitly if not explicitly related to the natural inclusional understanding of ‘receptive space’ (see below) and the ultimate mutuality of organism and world that has been emphasized by, for example, Oyama (1985), Lewontin (1991) and O’Regan and Noë (2001). Nonetheless, the focus on material-energetic linkage within ‘whole systems’ has generally obscured rather than clarified the vital dynamic relationship between figural and spatial presences that lies at the heart of understanding natural inclusionality. Some, like Bateson (1972, p.483), who said ‘the *unit of survival* is organism *plus* environment’ (my italics), have come to the threshold of this understanding only to be held back by attachment to connectedness and the all-confining whole.

At this moment, I invite you, my reader, to sit down in a chair, and to stare fixedly at your knee. Now, still staring, stroke your knee with your fingers. Now, continue stroking, but close your eyes. Now open them again. You might notice a tendency, when opening and closing your eyes, to change your perception of your knee. You

may 'flip' from a detached, insensitive objectification of your knee as though it was 'out there' somehow disconnected from your body, to a feeling awareness of its presence as a subtly textured, dynamic aspect of yourself enveloped in and enveloping rather than isolated by space. Whilst our binocular vision, from eyes in the front of our heads helps us to differentiate one thing from another and so catch or grasp 'objects' and avoid obstacles, this exercise demonstrates how it also has a dislocating effect. It seems that the objectivity of pure eyesight can dislocate your knee! It makes (air) space seem like a separating distance of 'nothingness' rather than a 'pool' in which we are immersed and gathered together.

When we close our eyes meditatively, we feel this pool around and within us as a vital 'presence of absence' rather than see (or rather, fail to see) what we take to be the absence of presence that comes between material objects. At the deepest level, we become aware of ourselves as gravitational inclusions of the universe through our sense of dynamic balance and acceleration. Unlike the standard 'five' senses of sight, hearing, smell, taste and touch, which are provided through organs (eyes, ears, nose, tongue and skin) explicitly detectable at the surface of our bodies, we tend to overlook or take for granted this 'sixth sense' or 'inertial guidance system'. Yet it is vital to our appreciation of our spatial situation and its potential as we experience the roller coaster of our everyday lives. It can literally take our breath away when the solid ground of our substance gives way and we begin to fall. Perhaps we fail to take account of it because the relational movements of our internal organs and the fluid in the semicircular canals of our inner ears from which it arises are hidden beneath our bodily surface. But by failing to take account of it, something, or, rather, somewhere vital can go missing from our conscious interpretation of nature and human nature, leaving us loveless and prone intellectually to replace our receptive 'centre of gravity' with an executive 'centre of control'. We can lose heart and create a culture of discontent.

As a corollary to this exercise, imagine air was water or, like a sheep or rabbit that you have eyes on the side of your head, giving panoramic rather than binocular vision. Does this change your perception of your surroundings and of yourself in relation to them? Are you less inclined to distinguish 'something' from 'nothing' and regard the latter as empty 'distance'? As we grow towards adulthood, especially when assuming

roles as hunter-gatherers and protectors, so we come to rely more and more on our boundary-hardening, object-defining eyesight to learn about and gain influence over the world around us. We may even suppress our other senses or allow them to diminish, along with our emotional responses. In this way we can lose touch with reality, whilst imagining that we have a greater grip on it.

So, now we come to the fearful barrier.

Letting darkness in: the fluidizing dimension of natural inclusionality

The concepts of ‘natural inclusionality’ and ‘natural inclusion’ (Rayner 2003, 2004, 2006, 2007, 2008a, 2008b, 2010) continue to expand upon and deepen ideas of organism-environment inseparability, as well as embracing the ‘theory of organism-environment system’ introduced by Jarvilehto (1998a and b, 1999, 2000a) within a new evolutionary philosophical and scientific paradigm. To reach this new paradigm, however, a very great conscious or unconscious human fear – the very fear that spurs the desire for power that imposes an unnatural order over other so as to try to ensure self-preservation – may have to be faced. This is none other than the mortal fear of uncertainty and loss that resides in Chaos and the archetypal Shadow of darkness in infinite nothingness (Jung, 1933). Only when this seeming void, the abyss of nothingness, is understood not to be an undermining absence but instead a vital omnipresence of *no-thingness* and source of loving influence, may we feel able to include it within the very core of our natural self-identity instead of attempting to cast it down beneath us or out beyond us.

The keyhole through which entry into this new paradigm can be found is hence somewhere that is literally everywhere, in front of our noses and up our nostrils. It is nothing less than the limitless presence of space as a receptive openness within, around and throughout the variably viscous natural flow-forms – the energetic configurations of space in figure and figure in space – that inhabit the cosmos, including ourselves. *Once aware of this presence we recognize the impossibility of defining or measuring anything in absolute numerical terms anywhere, because all form has both a ‘figural’, energetic boundary or ‘dynamic inner-outer interfacing’, which makes it distinct, and a ‘transfigural’ – ‘through the figure’ – spatial reach that*

cannot be sliced or limited. The transfigural space throughout and beyond the figure pools it within the co-creative, influential neighbourhood of all others. Without it, figures become lifeless and loveless, stone-cold bodies, integral or fractional numbers and idealized geometric points, lines and solids. It is what has gone missing from our abstract perceptions of nature in terms of objective or subjective ‘parts’ and ‘wholes’. Its return brings our conception of figures back to life and love in the naturally creative evolutionary dance of figural and transfigural presences in each other’s inseparable company and mutual influence. We escape the confinement and inconsistencies of the definitive *fixed boundary logic* of ‘one opposed to other’ that has held our imagination to ransom for millennia, and move on to a more natural form of reasoning in the *fluid boundary logic* or *fluid transfigural logic* of each in the other’s mutual influence.

To put it another way, we move from the rigid abstract logic of one and/or other that excludes the middle, to the *fluid natural logic of the including middle* that includes each in the other. Instead of thinking about ourselves and others as either absolutely separate or inextricably connected, we recognise all forms as variably open to one another’s energetic influence. Our boundaries are energetic interfacings that make us distinct, as natural flow-forms, but not discrete, as independent singletons. There is no need to claim paradoxically that on the one hand there are ‘bounded wholes’ whilst on the other ‘there are no boundaries between them’. Equally there is no need to speak paradoxically of ‘an infinity of wholes’, or indeed of an ‘infinite whole’ as a totality (independent singleness), which is a contradiction in terms (it is not possible to count up to infinity because infinity is a quality of space not a quantity of figures; neither is it possible to count down to zero, for the same reason).

Holding Openness

*You ask me who you are
To tell a story you can live your life by
A tail that has some point
That you can see
So that you no longer*

*Have to feel so pointless
Because what you see is what you get
If you don't get the meaning of my silence
Because you ain't seen nothing yet*

*You ask me for illumination
To cast upon your sauce of doubt
Regarding what your life is all about
To find a reason for existence
That separates the wrong
From righteous answer
In order to cast absence out
To some blue yonder
Where what you see is what you get
But you don't get the meaning of my darkness
Because you ain't seen nothing yet*

*You look around the desolation
Of a world your mined strips bare
You ask of me in desperation
How on Earth am I to care?
I whisper to stop telling stories
In abstract words and symbols
About a solid block of land out there
In which you make yourself a declaration
Of independence from thin air
Where what you see is what you get
When you don't get the meaning of my present absence
Because you ain't seen nothing yet*

*You ask of me with painful yearning
To resolve your conflicts born of dislocation
From the context of an other world out where
Your soul can wonder freely*

*In the presence of no heir
Where what you see is what you get
When you don't get the meaning of my absent presence
Because you ain't seen nothing yet*

*You ask me deeply and sincerely
Where on Earth can you find healing
Of the yawning gap between emotion
And the logic setting time apart from motion
In a space caught in a trap
Where what you see is what you get*

*And in a thrice your mind is reeling
Aware at last of your reflection
In a place that finds connection
Where your inside becomes your outside
Through a lacy curtain lining
Of fire, light upon the water*

*Now your longing for solution
Resides within and beyond your grasp
As the solvent for your solute
Dissolves the illusion of your past
And present future*

*Now your heart begins to thunder
Bursting hopeful with affection
Of living light for loving darkness
Because you ain't felt no thing yet*



Figure 7. 'Holding Openness' (Oil painting on canvas by Alan Rayner, 2005). *Light as a dynamic inclusion of darkness continually brings an endless diversity of flow-form to Life.*

As William Wordsworth recognized almost 200 years ago, 'in nature everything is distinct, yet nothing defined into absolute, independent singleness'. The discrete (completely definable) numerical units of conventional mathematics and assumed to exist by every objectivist science theory – including Darwin's adversarial notion of 'natural selection, or the preservation of favoured races in the struggle for life' – cannot and do not exist in the variably fluid cosmos we actually inhabit. Evolution cannot proceed through the paradoxical imposition of external, selectively judgemental force upon singular subject-objects. Evolution can only proceed through natural inclusion – *the co-creative, fluid dynamic transformation of all through all in receptive spatial context.*

Within the limitless pool of receptive space and its vital inhabitants I think we can find an understanding that brings hope of a more creative, sustainable and loving future for humanity and our companion life forms (cf. Fig.6). But in no way do I underestimate just what an enormous upheaval this may bring for the way we imagine

and live our lives. To sustain this understanding depends on the *imaginative* and *coherent* capacity to hold *both* the *figural* (local energetic configuration of space) *and* *transfigural* (nonlocal continuous depth/openess of space) *simultaneously* and *dynamically* (i.e. fluidly) in mind. One then 'sees' in the mind's eye the 'warm geometry' of a continually reconfiguring, variably viscous, dancing evolutionary flow of natural form as space in figure and figure in space – not unlike the flow of a 'lava lamp'.

In essence, the dynamic, mutually inclusive interplay of the fluidly figural (energetic) and omnipresent transfigural (space) is very simple and should be effortless to envisage. But within the cultural context of habitually 'hard-lining' things as complete, abstract, idealized figures it may require considerable effort. This culture leads us paradoxically to try to unify physical laws into a single formulation by imposing disunity (i.e. discontinuity) on natural energy flow, driven inscrutably from within or without an abstract cut-off zone. There is then always a tendency to default to the literal, definitive imagery of the figure alone in which we literally *lose imaginative sight* of the truly *continuous* transfigural space that *pools all gravitationally together* in a *natural communion* of each in the other's reciprocal influence. This leads us to contemplate only the possibilities of the absolute interconnectedness (*contiguity*) or absolute separateness (*discontinuity*) of material or energetic form in a false dichotomy and dialectic of each opposed to other, allowing greed, power and profit motives to run riot in an unsustainable relationship between human aspiration and natural need.

It may hence take even more imagination, together with a huge breadth and depth of scholarly knowledge and intellect, to envisage the *implications* of natural inclusional imagery for understanding our natural neighbourhood and to appreciate how this involutes (turns outside-in) the freeze-framed, oppositional concepts of abstract rationality into the fluid understandings of complementary reciprocity.

Correspondingly, there is a historical pattern that repeats itself again and again through different kinds of intransigent local or non-local denial of the other, when the receptive presence of transfigural space and associated responsive-reflective figural presence of dynamic interfacings/boundaries is *neglected* through inadequate mental

imagery of one kind or another. Both environmental and soulful devastation can arise from this neglect (cf. Fig. 5). In broad outline, the pattern may be represented as follows:

Primordial wishy-washiness --> Rigid Definition --> Abstract

Reductionism/Pluralism/Dualism/Fragmentedness --> De-definition --> Wishy-washiness --> Re-definition --> Holism/Monism/Oneness/Wholeness -->?

This pattern of neglect and denial may be related to an actual human condition called 'unilateral neglect' which follows damage to one brain hemisphere or other (most usually the right hemisphere) and results in inattention to one half of the visual field (the left half, if the right hemisphere is damaged). In a similar kind of way, the predomination of analytical over intuitive thought, or vice versa, may involve inattention to or lack of communication with what the other half is offering.

By excising/occluding the middle ground of transfigural space, rationalistic 'left brain hemisphere' perception becomes satisfied that it has completely accounted for Nature, by defining everything as a discrete material body within a discrete frame of space/time, and in so doing liberated humanity from the imprecise 'wishy-washiness' of 'right brain hemisphere perception' (cf. McGilchrist, 2009). Nature is divided up into innumerable, discontinuous, purely material parts and wholes that can be ruled into order according to the Laws laid down by a single sovereign authority. The most common upshot is reductionism and monotheism.

'Right brain hemisphere perception', meanwhile, recognizes the limitations of the reductive view and seeks to remove the definitive boundary limits imposed by it. The reductive view vehemently opposes this seeming assault on its integrity (which comes with a false and paradoxical sense of absolute security and freedom) by reinforcing its boundary limits as much as it can. But if it feels the discomfort that arises from its restrictive definitions, it may eventually be unable to resist collapsing into the nihilistic, angst-less, no-self world of wishy-washiness (nirvana/ La la land) coming from pure right-hemisphere perception. Once in this no-self world, however, left hemisphere perception may spring back into action to recapture a sense of local definition (completeness) at the global scale of the 'Whole' as 'Oneness' (i.e. the rigid

definition gets shifted from individual to collective, microcosm to macrocosm), and sticks there. Meanwhile, the third, natural inclusional way of viewing each fluidly in the influence of the other through transfigural space gets overlooked in the war of mutual contradiction between the 'Many' and the 'One'. Evil emerges through the unnatural exclusion of darkness, not its natural inclusion as a receptive presence.

If transfigural space is imaginatively included, however, we get:

Primordial wishy-washiness --> Fluid Distinction --> Natural
Inclusionality/Transfigural/Three-in-one locality (somewhere) in non-locality
(everywhere)

In a world of endless co-creativity.

The ability to *distinguish*, but not necessarily *define* unique identities is a vital condition for intervention and participation in the world. A newborn baby may have no such sense of distinction between self and world, so that all that happens seems to happen to itself. The experience of meditative trance and what some have called 'no – self', 'core consciousness' and 'inspiration phase' mental activity (Harding, 2000; Damasio, 2000; Claxton, 2006) may correspond with this lack of distinction and openness to all possibility. With the development of co-creative relationships with other people and outside world, however, the child needs to make distinctions between her/his body and others in order to receive, respond to and provide directional guidance. An objective/subjective 'self-consciousness', 'extended consciousness' and 'elaboration phase' mental activity develops (Harding, 2000; Damasio, 2000; Claxton, 2006), along with an awareness of personal joy and pain through learning experience of self-inclusion in natural neighbourhood. As this takes hold – and may even be regarded as a 'superior' form of 'intelligence' (Damasio, 2000; Claxton, 2006; cf. Harding, 2000) it may, however, harden into objective self-definition and the rationalistic idea that something that happens to other people does not happen to 'me'. With this hardening comes the loss of compassion that allows the intransigent and abusive mentalities to predominate.

With further cognitive development it is possible that the disconnected adult, who hardens natural distinction into abstract definition, may start to realize that the natural *spatial communion* (as distinct from energetic-material connectedness) between self and world was, however, never really cut – and couldn't be cut because space can't be cut and hence *doesn't stop at boundaries*. But this further, natural inclusion realization entails a radical transformation of perspective that can meet strong and fear-full resistance from those feeling empowered by their mental detachment to have a sense of freedom, security and dominion over other. This feeling is reinforced by convenient but simplistic objective logic, methods of quantification and calculation, and *language*.

Overcoming Linguistic Definition: The fluid logic and language of natural inclusion

Just as a river is both shaped by and re-shapes the landscape through which it flows, so our human use of verbal language to communicate with one another about what we are *observing, thinking, feeling* and *imagining* is both influenced by and influences our worldview. Language can hence both confine and liberate us. It can reinforce the deep entrenchment of habit that cannot break out of the familiarity of its past enterprise. It can also help to locate and open up the escape channel that enables a shift of course.

With the development of inclusion concepts, a new logic and principle of the '*including middle*' emerges in which the *inhabitant* is a fluid expression of the habitat, not a rigidly definable exception from it, as the worldview of objective rationality would have us believe. Content simultaneously forms from and responsively gives expression to the receptive spatial pool that it fluid dynamically includes and is included in; the inhabitant transforms the habitat and vice versa as inseparable but distinguishable aspects of one including the other, nested over all scales from microcosm to cosmos. Understanding inclusion flow entails the dynamic relational, space-including, local-non-local logic of 'somewhere distinct as a dynamic informational inclusion of everywhere spatial throughout', not solely the local logic of discrete, opposing, material objects.

So, what kind of language can best communicate this new, fluid logic and principle that recognises dynamic distinction but not rigid definition and so calls into question so much of our familiar way of thinking in terms of discrete whole objects and sequential cause and effect? Clearly, any language which originates in rationalistic logic will reinforce that logic and so tend to be inconsistent with and to obscure inclusional meaning. This problem may be deepened if the role played by the narrowed down focus of our left brain hemisphere in the production and comprehension of verbal language comes to predominate over the more intuitive, all-round awareness yielded through our right brain hemisphere (McGilchrist, 2009). If we are not very careful, verbal language is very liable to entrap us unimaginatively in ‘tunnel vision’ and to lose imaginative ‘circumspection’ (cf. Fig. 3.). But we need inclusionally also to be careful not to allow our awareness of this problem to lead us to disown verbal language and get caught forever instead in the trap of meditative paralysis where nothingness and blissful inaction prevail. Words and action are interdependent, both vital to our human co-creative potential as social flow-forms inhabiting a common hearth.

For me, awareness of this problem in itself suggests its solution: to be prepared to loosen the definition of verbal language in ways that allow it to come alive and attune dynamically with our continually transforming evolutionary circumstances. A living, evolutionary logic needs a living, evolutionary language if it is not to tie itself up in knots of paradoxical inconsistency. This language needs to bring the focused and circumspect perceptions of left and right hemisphere together through the communication channel of the corpus callosum that includes each in the other’s influence, not to drive them apart through intransigent neglect and severance.

What this means in practice is learning to use language *poetically*, to evoke meanings and acknowledge dynamic distinctions, not *literally* to impose abstract definitions on natural flow-form. This is why I have come to use language with very great *care*, seeking to avoid the pitfalls into the totalizing definitions of both reductive and holistic thought whilst recognizing as well the co-creative complementary contributions such thought can bring to human understanding when brought into dynamic synthesis. Of course I recognize that this is not easy. It is never easy to break deeply embedded habits. I struggle to find the expressions that consistently convey

my meaning, whilst not departing utterly from the familiarity of past usage. I am frequently accused of esotericism, of trying to hide my meanings behind a smokescreen of jargon – which is as far from my real intention as it could be. I am frequently accused, if I point out the rationalistic implications of familiar expressions, of trying to impose my language on others – which again is as far from my real intention as it could be. I am merely trying to invite consideration of what kind of language is consistent with natural inclusional meaning, and offering the best that I can at the time of writing or speaking, always prepared to change this if a more effective expression surfaces that doesn't simply re-entrap in rationalistic imagery. This is a great challenge for *me*, and, I suggest, a great challenge for *us* if we are to overcome our language impediment and make our living educational theory and practice more naturally inclusional.

The transfigural mathematics and physics of the *including middle*

So, to return to that other kind of definitive language impediment that gets in the way of natural inclusionality. So deeply embedded has conventional mathematical misrepresentation of nature become in our modern scientific, economic and technologically dominated culture that as long as it remains unquestioned, it can only reinforce the simplistic representation of a local figure as a discrete individual identity or 'absolute independent singleness' and 'one aloneness'. Moreover, this problem will remain entrenched as long as space is mentally isolated from matter and treated as an absence or gap that literally counts as nothing, whereupon points along and beginning and ending a line are inevitably discrete, and can only be contiguous (adjacent) not continuous (in common space or communion).



Figure 8. 'How Compassion Fruits' (Oil painting on canvas, by Alan Rayner, 2008). *Life, love and suffering spring from the same source of receptive space that is present within, throughout and beyond the earth, air, fire and water of inspiring and expiring natural flow forms as energetic configurations. These natural figures dynamically balance receptive negative influence and responsive positive influence through the reflective zero-point core of their local and non-local self-identity.*

A new system of numbers and geometry has, however, been developed, called 'transfigural mathematics', which, I think, solves the problem of continuity through the natural inclusional logic of dynamically including space in figure and *vice versa*, through *transSpace* (Shakunle 2006; see also Fig. 1). Correspondingly, rather than treat numerical identities as dimensionless points along a discrete line, and so in effect excluding the receptive space of both zero and infinity, this mathematics envisages

numbers as dynamic relational neighbourhoods. Here, overlapping local informational spheres of non-local spatial influence form a ‘dimension-full line’ or ‘channel’ (cf. Shakunle and Rayner, 2007, 2008) in which reciprocal, spiralling inflows and outflows are dynamically balanced through inner core identities called ‘zeroids’ (from *zero identities*). The zeroids sustain a simultaneously receptive, reflective and responsive fluid relationship with their immediate environmental neighbourhood, and through this neighbourhood with all Nature. There are two distinctive ways in which flow and counter-flow are dynamically balanced in the resulting flow-forms. What is called ‘odd-balancing’ produces channels whose intra-space communicates along linear series of local figural identities. This gives rise to what are conventionally regarded as ‘material bodies’. What is called ‘even-balancing’ produces flow-forms whose intra-space communicates in circuits, corresponding with what is conventionally regarded as ‘electromagnetic radiation’. Hence we have the basis for dynamic relationship between ‘all-round circumspection’ and ‘directional focus’ that is key to understanding the kind of pattern shown in Figure 3.

Modern physical understanding of dynamic processes of all kinds, from subatomic to universal scales and encompassing the evolution of living systems, continues to be restricted by the rationalistic treatment of figural boundaries as discrete limits and space as fixed, empty distance between material objects. Such treatment is not scientifically rigorous – much as its proponents might claim it to be – because it is rooted in a presumption that is not consistent with evidence and does not make consistent sense. It threatens our potential to live in a sustainable way, in dynamically attuned relationship with our natural circumstances and one another. Its inadequate models are liable to be deeply misleading in the long run. As I have indicated, such treatment is founded mathematically in the abstract geometry of Euclid and arithmetic of discrete numerical units, which formed the basis for Newtonian mechanics and the development of objective, quantitative science aimed at prediction and control. It is, however, profoundly unrealistic in being based on the illusion that matter ultimately consists of solid, massy particles *surrounded* by (and hence *excluding*) non-interactive space. This illusion leads to the dualistic ‘paradoxes of completeness’ that underlie the interpretation of change as the consequence of *applying energy as purely external force* upon *discrete* (isolated) and hence independent bodies (cf. Hofstadter, 1980). It leads damagingly to the mental exclusion and objectification of ‘environment’ as

‘external surrounding’ that the ‘self’ both exploits and struggles against, not the natural neighbourhood of which the ‘self’ is inescapably an inclusion.

Here a fundamental difference between rationalistic and natural inclusional/transfigural perceptions of continuity emerges:

1. In rationalistic thought, continuity is equated with ‘connectedness’ because space is regarded as void, a source of discontinuity or disruptive gap between and around ‘things’ as discrete objects. Hence the only way of deriving continuity in this ‘whole way of thinking’, is either by totally excluding space and boundaries from form as a continuous line or network of width-less threads, or by totally conflating space with form in a seamless [boundary-less] whole. Such exclusion or conflation is neither consistent with evidence/experience nor does it make consistent sense. In a way, it is a product of holistic wishful thinking that seeks to eliminate rather than reconcile the occurrence of natural distinctions, because these are seen as a source of disharmony. It is an over-reaction to the over-definition of boundaries characteristic of analytical thought, which seeks to replace the latter with its antithesis instead of seeking the dynamic synthesis and balance that natural inclusionality/transfigural provide (Rayner, 2004).

2. In natural inclusional and transfigural thought, space is a continuous omnipresence that cannot be cut, confined or excluded, and form is *dynamically continuous* through its energetic inclusion of space in figure and figure in space. Distinction and difference are hence accommodated in a natural fluid continuum, without contradiction. Local identity is recognised as a dynamic inclusion of non-local space in which all forms are pooled together (but not absolutely merged) in natural communion as flow-forms.

3. Correspondingly, the treatment of continuity by abstract rationality as the same as connectedness – as exemplified in conventional calculus, where continuity is approximated by connecting infinitesimal discontinuous units – is an idealized construct that is physically impossible. The very idea of complete ‘whole units’ existing anywhere, at any scale in Nature as an energetically open, fluid system does not make sense. Natural inclusional and transfigural connectedness arises from the coming together (attachment/inter-connectedness) and fusion (conjugation/intra-

connectedness) of energetic paths, corridors or channels of included space (intra-space) in labyrinthine branching systems and networks, not the ‘ties that bind all into a web of one’.

Natural inclusionality and transfigurality open up, through the vital inclusion of transSpace, a radically more creative, realistic and ultimately less environmentally adverse understanding. Instead of regarding ‘space’ and ‘boundaries’ respectively as ‘gaps’ and ‘cuts’ that impose discontinuity between discrete material objects, these are understood as sources of continuous receptive influence and energetic interfacing that makes distinct but not discrete throughout Nature as a limitless pool. With this understanding, I think that new insights of the fundamental nature of gravity, heat, energy, matter, space and time become possible, along with a new mathematical foundation for their natural representation. Long-standing dichotomies between particle and wave, observer and observed, certainty and uncertainty, electromagnetism and gravity, free energy and entropy, and correspondingly deterministic and stochastic models of reality melt into fluid flow-form. ‘Energy’ becomes understood not as a source of executive *force*, independent from space, but as a source of figural *influence* inclusive of space. And with that turn-around, comes a new perception of self-identity.

‘I-opening’ - the natural inclusional self in educational theory and practice

So what does the natural inclusional self look like in practice? Does it have an inclusional practice, a way of behaving, which can be learned? What kind of theory might underlie this practice?

From what I have already said, it is clear that inclusional ways of living, loving and learning emerge from an attitude of mind and heart, not from following a set procedure or boning up on written texts whose words cannot in themselves convey the depths of feeling and intuition involved. This attitude is intellectually justifiable in terms of an understanding of natural energy flow as the dynamic inclusion of space in form and form in space, which contrasts with the fixed, definable form assumed by objective rationality to be the primary, default condition of Nature.

But this doesn’t mean inclusionality can only be practiced by an elite class of people with esoteric knowledge and understanding. Indeed, if anything, inclusional behaviour

comes most naturally to anyone whose attitude has not been restricted by the restrictive theories and practices that we have been teaching ourselves for millennia.

Inclusionary ways of relating are correspondingly most evident when we feel relaxed in surroundings and company that we love – especially beyond the confines of what many of us regard as our *workplace*. And therein may lie a lesson in itself – that we experience most difficulty in living a life of ‘self as neighbourhood’ in settings that we have come to associate with *work*. For it is just in such settings that we have used fixed assumptions of objective rationality to *entrain* and control ourselves as unthinking robotic followers of instruction in restrictive practices – not *educate* ourselves into a wider awareness of our human creative potential.

It is as though we regard work not as a source of mutual sustenance and pleasure, but rather as a stern obligation of what we must do to survive in the harsh reality of life as a battleground, not the adventure of life as a playground. This is most painfully obvious when the workplace really *is* a battleground. Here is how John Keegan (2004) describes military training:-

‘...the deliberate injection of emotion...will seriously hinder, if not altogether defeat, the aim of officer-training. That aim...is to reduce the conduct of war to a set of rules and a system of procedures – and thereby make orderly and rational what is essentially chaotic and instinctive. It is an aim analogous to that pursued by medical schools in their fostering among students of a detached attitude to pain and distress... the rote-learning and repetitive form and the categorical, reductive quality ...has an important and intended psychological effect. Anti-militarists would call it depersonalizing and even dehumanizing. But given...that battles are going to happen, it is powerfully beneficial...one is helping him to avert the onset of fear, or, worse, of panic... ’

Here it is all too clear how the assumption that conflict is inevitable becomes a self-fulfilling prophecy, which rationalistically objectifies the person by excising or confining the limitless space that brings uncertainty and vulnerability (and love) and imposes in its place a rigid frame of deadening predictability. The ‘self’ is sustained in a confrontational stance as an automaton or living contradiction of its natural

neighbourhood through mindless and heartless routine and ritual, in which learning is reduced to rehearsal for one kind of prescriptively staged performance or another. Sense, sensibility and creativity are ruled out by rules and regulations of pride, prejudice and habit that define what can and what cannot be accepted by the *status quo*.

The resultant habitual patterns of thought and behaviour subservient to prescriptive codes of conduct and practice are evident throughout modern human culture in the hierarchical and adversarial design of our academic, governmental, industrial, commercial, religious and sporting organizations. Everywhere, this design impedes evolutionary possibility through the imposition of megalithic structures that oppose change. It even projects itself onto instead of learning from the energy flow of non-human nature, exemplified by the Darwinian oxymoron of 'natural selection' as the 'preservation of favoured races in the struggle for life'.

Such thinking cannot, by its very nature, solve the enormous environmental, social and psychological problems of its own making that humanity sees as confronting itself at the beginning of the twenty-first century. It is its own worst enemy.

This is where the transfigural and natural inclusional way of thinking about 'self' could help greatly. It becomes possible not to regard 'self' as a 'fixed locality', stuck forever in the same old skin, with the same old genes controlling its every move, on course for inevitable competition and conflict. Instead self is understandable as a dynamic locality of its non-local natural neighbourhood, capable both of changing and being changed by its circumstances, like a river in landscape that is never the same twice. This is essentially how inclusionality provides the kind of 'unhooked thinking' that can help us out of the helplessness (often 'learned' and culturally enforced) of assuming habitual behaviour is pre-ordained - a 'problem with us' as singular individuals, as distinct from 'a problem for us' as 'living neighbourhoods' (Pryor and Rayner, 2005a,b). And in getting our selves 'off the hook' it may be possible to unleash enormous creative potential that is inherent in our capacity for 'play'.

Here, a cognitive or 'mental imaging' difficulty that many people have with deeply understanding natural inclusionality may arise through confusing 'presence' with

‘tangibility’. If ‘space’ is to be recognized as a ‘presence’, this makes people to try to make it ‘substantial’ in some way, for example as ‘aether’, ‘space-time fabric’, ‘dark matter’, ‘dark energy’, ‘subtle energy’, ‘dark flow’ etc. No sooner do they do this, than it becomes definable and/or divisible in some way as a singular ‘whole’ (independent singleness). Since this doesn't make sense - because you can't cut or resist what has no tangible resistance - the mind may then revert to regarding ‘space’ as ‘absence’ or ‘nothingness’, which can't ‘interact’ with ‘tangible form’ and so is regarded as a source of discontinuity and distance between one form and another.

This is the foundation of ‘mind-matter’ and ‘one-many’ dualism/dichotomy (Rayner and Jarvilehto, 2008), from which there is no escape *unless* the key insight of natural inclusionality and transfigurality is appreciated - that ‘space’ is neither ‘nothingness’ nor ‘somethingness’, but ‘no-thingness’ - intangible, non-resistive, continuous (and thereby transfigural) presence, which figural (energetic) presence can dynamically configure/relate through but not inter-act with (Shakunle, Rayner, 2008). No energetic boundary can resist the transfigural omnipresence of space - it is itself a dynamic configuration of space - it can only offer variable degrees of resistance (impermeability) to figural presence.

Correspondingly, a ‘living I’ cannot be a hermetically sealed, autonomous unit isolated from its neighbourhood, because the space within its distinctive but not absolutely definitive bodily boundaries is continuous with the space beyond these boundaries. It finds identity not in its inner self, alone, but in its variably receptive, reflective and responsive energetic relationship with its limitless and changeable surroundings. It lives as an energetic inclusion of space in figure and figure in space, a natural dynamic inclusion of its context. It is a ‘natural inclusional I’, not an ‘abstract I’.

All in all, a natural inclusional evolutionary understanding of self-identity provides scope for a more comprehensive, less hard-line improvisational educational practice that effectively combines directional *focus* with all-round *circumspection*. This practice is both instrumental – as a source of knowledge, and inspirational – as a source of understanding, in encouraging co-creative learning in diverse communities with fluidly tolerant and versatile qualitative and quantitative guidelines for

evaluation of open-ended learning outcomes. Instead of instructing our selves to conform to pre-selective standards, we truly educate our selves to become involved in an ongoing process of ‘natural inclusion’ – the fluid dynamic, co-creative transformation of all through all in receptive spatial context.

Exemplifying the natural inclusional self in my own educational practice?

So, the question is, how representative am *I* of the natural inclusional self in my own educational practice? How could I claim to know? How can I avoid the danger of narcissistic self-reference at the same time as avoiding the danger of objective self-exclusion? These are questions that I know have much exercised action researchers and living educational theorists, whose reflective-reflexive, participatory and invitational space-opening practice epitomizes what comes naturally from a perception of ‘self as neighbourhood’. Often this practice is justified in terms of emotional values, such as a burning desire for social justice, a commitment to environmental sustainability or recognition of the need to take account of individual uniqueness and embodied knowledge. What I am hoping this paper may have helped to bring out is that this practice is intellectually as well as emotionally justifiable. It is the product of a kind of logic that is consistent with evidence and makes consistent sense – unlike the abstract forms of rationality that exclude sensitive and sensible feeling by excluding the limitless pool of receptive space from their focus on figures alone as inscrutable ‘drivers’. Natural inclusionality, to my mind can be regarded as a new kind of ‘rationality’ that doesn’t divide our human experience up into discrete ‘rations’, deprived of what is vital to our capacity to live, love and suffer.

But, to return to my question, I will offer this example. For the past ten years, I have taught a final year transdisciplinary undergraduate course at the University of Bath, entitled ‘Life, Environment and People’ (see my description of some of the turbulent and difficult history of this course in Rayner, 2006a). Every now and then as I present this course, which is participatory and invitational in style, I find myself having to stop and remind the students and myself about its fundamental intention. I say something along the lines of: *'this is not intended to be a course of instruction, but more an opening of possibility for your personal reflection and consideration by*

describing what makes sense to me'. I could say much the same about all of this paper. I feel the need to say it because I think that the expectation of instruction - and the painful memories of non-empathic schooling - that this can evoke and be read into what is offered, blocks receptivity. I have simply *to admit that I can only explicate my perceptions and reasoning for opening the door into natural inclusionality in my personally unique way, using whatever means I have available to me, and invite others across the threshold if they wish*, where I will be pleased to welcome, help and engage with their enquiries as best I can. Whenever I forget to say or admit this, and engage instead with a perceived requirement or actual demand to *convince* others, I sense resentment and resistance rising within my listeners, and can all too easily become defensive and resentful myself. Maybe that continual reminder to 'hold openness' (Fig. 7) is deep in the core of an inclusional educational practice. Maybe this is why the *unsolicited* expression of how students see me shown in Fig. 9 means so much to me. Whether they realized it consciously or not, this simple image instantaneously expresses the natural inclusional nature of individual self-identity as a dynamic inclusion of its local and nonlocal neighbourhood, with darkness in and around all.



Figure 9. 'Rayner Flower'. *How Bath biology students presenting a second year undergraduate seminar about the practice of science portrayed me as an energetic inclusion of darkness*

What May Not Be Obvious

Every body is a cavity at heart

Every figure reconfigures both in science and in art

Every face is interfacing from no bottom to no top

Every faith is interfaith that cannot tell us where to stop

Every lining opens inwards as it brings its inside out

Every curtain closes outwards to conceal its inner doubt

Every story ends in opening from some future into past

Every glory is the story of finding first in last

Every aching is the making of another role for play

Every taking is the slaking of another's thirst to stay

Every tiding's no confiding with-out the trust to tell

Every siding is no hiding from the fear of utter Hell

Every flowing is the ebbing of another's world within

Every glowing is the lighting of the darkness in the spin

Every heartbeat is the murmur in the core of inner space

Every drumbeat is the echo of the dance within each place

Every silence is the gathering of the storm that is to come

When Love comes to Life

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