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## **The signature of the whole. Radical interconnectedness and its implications for global and environmental education**

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# Die Dekade für Menschenrechtsbildung der Vereinten Nationen (1995-2004)

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und Menschenrechtsbildung
- Menschenrechte und  
Menschenrechtsbildung in Südafrika
- Menschenrechtsbildung in der  
Jugendarbeit
- Menschenrechte und  
Befreiungspädagogik

# Zeitschrift für internationale Bildungsforschung und Entwicklungspädagogik

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David Selby

# The Signature of the Whole

## Radical Interconnectedness and its implications for Global and Environmental Education

*Zusammenfassung: Der Autor präsentiert ein holistisches Konzept Globalen Lernens in Auseinandersetzung mit verschiedenen Wissenschaftsdisziplinen, spirituellen Anregungen und praktischen Konsequenzen. Die globale Umweltkrise interpretiert er dabei v.a. als eine Krise der Betrachtung von Welt, die von mechanistischem Denken geprägt sei.*

*Abstract: The author presents a holistic concept of Global Learning, concerning different scientific disciplines, spiritual suggestions and practical consequences. He interprets the global environmental crisis especially as a crisis of worldview, stamped by mechanistic belief*

### Down Green Lane

Between the ages of five and ten, in the 1950s, I lived in the village of North Hykeham, a few miles outside the cathedral city of Lincoln, on the edge of the Lincolnshire fenlands, England. To reach the fens we had to walk from the village down a bridle track called Green Lane. To go down Green Lane for any child interested in nature was to enter a world of wonder. In wintertime, the fens would freeze over and it was possible to walk for miles over ice, slipping and sliding, looking for animal tracks, with one ear cocked for the sound of creaks and groans indicating that you were literally approaching thin ice and that it was time to retreat. Not that ice walking was life-endangering - except for the drains and river ways the water stood only about two-feet deep for mile after mile. To fall through the ice was cold and unpleasant, but also quite a thrill. In spring and summer the fens transformed into a vast wild garden of flowers with evocative names such as Marsh Marigold, Lady's Smock, Ragged Robin, Red Campion, Monkey Flower. I spent day after happy day searching for flowers and keeping an annual scrapbook of pressed flowers, noting the date of first seeing the flower in bloom each year. Each year we watched the coming of birds in the spring, their going in the fall. We knew the badger holes, the fox coverts, the broken-down willows where the shrews nested.

In the early 1980s I took my children to see this place of wonder, the place where I had lived out some of the happiest

times of my boyhood. Green Lane had become the principal road through a suburban housing estate. The fens had been drained in the name of agricultural development and efficiency (as understood by Strasbourg bureaucrats). The place where

I once lost my Wellington boots in a mire of mud one spring-time - to be chided heavily by my mother in those impecunious times on returning home bootless - had been concreted over. The sense of loss was palpable. Somehow, part of me, a source of my identity, of my sense of self, had been taken away.

This personal story captures for me some of the lifespings of modern environmentalism: the adult experience of loss of places of deep meaningfulness in our lives through rampant development and urbanization; of increasing disconnection from nature and, through that estrangement, an existential crisis of identity (Tomashow 1996). The tarmacking of Green Lane was both process and symbol of disconnectedness from the Earth and the erosion of identity.

### The Global Environmental Crisis as Crisis of Worldview

Hand in glove with this sense of loss has grown in many of us an uneasy sense that our window on the world - our worldview - is somehow distorted, deeply destructive in its impact, and quite insufficient to either understand what is happening to the planet, or to do anything fundamentally about it.

A number of commentators have argued that mainstream Western thinking has inherited a worldview from seventeenth and eighteenth century scientists and philosophers that is underpinned by notions of separation, otherness and domination. That worldview, they argue, has been deeply influenced by Francis Bacon's view that the goal of science was to enslave nature (and in the process of which "to torture nature's secrets from her"), and by Rene Descartes' division of the world into *res extensa* (mechanical extended substances or matter occupying space) and *res cogitans* (things of the mind neither limited by nor occupying space) and by his consequent arrogation of mind and free will exclusively to humans. This has led to our creating a hierarchy within ourselves (mind above emotions and body) and to our locating

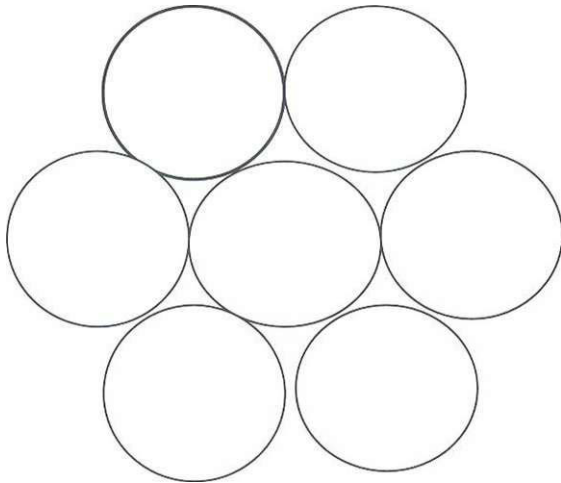


Fig. 1: Billiard Ball Model

ourselves outside and above nature (which has no mind). This has also correlated with our according only instrumental value to nature (nature as mindless resource); our denying ethical and moral status to other life forms and to environments (in that they are mindless machines); and, thus, to our allowing ourselves virtually unfettered license to exploit (Bateson 1973; Bohm 1990; Capra 1983; 1996; Evernden 1985; Merchant 1981). While fuelling the hubris of uniqueness, it has fostered our modern sense of alienation and existential crisis. "We are distinct from everything around us and inexorably alone" (Zohar 1990, p. 34). We suffer the illusion of experiencing ourselves as "isolated egos in the world" (Capra 1983, p. 29). "We have cut ourselves off from outer confirmation of our inner life" (Zohar, 1990, p. 217).

The machine image and understanding of the world as put forward by the likes of Descartes, Bacon and Newton, the same commentators maintain, has also become deeply embedded in Western thought. We try to understand how something works by dividing it into what are held to be its discrete component parts. If an identified part malfunctions, we tend to it without reference to the whole. Understanding - and control - are achieved through compartmentalizing, pigeonholing, and analyzing, through atomism or reductionism. Separation is the name of the game (Capra, 1983; Callicott, 1986, Merchant, 1981). The general practitioner or specialist tend to a pain in a part of the body without reference to the rest of the body, to the patient's psyche, to social and environmental relationships (the specialist often particularly so in that the greater the degree of specialism the more frequent the occurrence of specialism-myopia). The corporate executive toasts a hefty credit over debit account without factoring in the environmental, cultural, social and psychological costs of gathering raw material, processing, and distributing the firm's product. The science teacher teaches the flower by having the child name the parts, but misses the essence of the flower (more than the sum of its parts) and of the flower in its context. A reductionist mentality also tends to wed its adherents to a deterministic outlook. Just like in a machine process, in which nearby components react one upon the other, events in the world are viewed as happening in an

inexorably linear fashion, while instability and chance are seen as shortcomings in our present capacity to control - as "physical problems awaiting mechanical solutions": (Callicott, 1986,303). Within reductionism "all causal relationships are reducible to the motion or translation from point to point of simple bodies or the composite bodies made up of them. The mysterious causal efficacy of fire, disease, light, or anything else is explicable, in the last analysis, as the motion, bump, and grind of the implacable particles" (ibid, p. 303). Only our minds, Cartesianism holds, are free to range as and where they want (Cottingham 1986).

The dualisms spawned by Cartesian thought (e.g. human-animal; mind-body; masculine-feminine; us-them; inner-outer; subject-object; reason-emotion; spirit-matter; culture-nature; teacher-learner) and the hegemonic thinking they inspire have become very ingrained in the Western mindset. Overlay one or more dualisms, as mainstream Western culture has done and continues to do, and we create the hegemonic attitudes and structures that liberationist and transformative educators are now called upon to confront. Masculine-feminine, mind-body, reason-emotion, subject-object, for instance, superimposed, yield the mental and social scaffolding of patriarchy (Plumwood 1993, p. 43). Of these dualisms, more later.

## Global and Environmental Education as Responses to the Mechanistic Mindset

In their most transformative expressions, global and environmental education can be viewed as educational counter-cultures to mechanism and reductionism as they have colonized education, and as educational expressions of a holistic paradigm (Selby 1999; 2000a). This is often expressed symbolically using the billiard ball and web models (Fig. 1 and 2). The billiard ball model - depicting a cluster of billiard balls on a billiard table - has been employed to indicate separateness, discreteness, and forms of external relationship between things where the relationship has no effect upon their internal structure and dynamics (Zohar 1990, p. 81). In education the model finds expression in the division of arts and sciences, separate subject disciplines, grade apartheid, individualized learning, the strict delineation of who is the teacher and who the learner, and the arms length relationship between school and community (Greig/Pike/Selby 1989, p. 18-24).

Transformative global and environmental educators have countered the model or metaphor of the billiard ball with the model or metaphor of the web (understood dynamically). The latter has seemed to convincingly capture understandings drawn from ecological and quantum (sub-atomic) science that:

- Everything is dynamically connected and related to everything else.
- Nothing can be completely understood save in relationship to everything else.
- Identity is multi-faceted and includes a significant near-and-far contextual element.
- What happens somewhere will impact to a greater or lesser

extent elsewhere, even everywhere (captured to some extent in the environmentalist's saying, "You are always downstream of someone").

- What happens locally is also a global phenomenon ( a part of the whole, itself acting to inform the whole) and that the signature of global events will be manifest locally.
- Different global issues - such as environment, development, health, peace, rights - are interconnected.
- Past, present, and future are interwoven, co-evolving and co-creating elements of time.

Using such insights as captured in the web metaphor, global and environmental educators have developed curricula, teaching materials, and learning activities built upon the concepts of interconnectedness, interdependence, and inter-relationship (see, for example: Fountain 1995; Pike/Selby 1999; 2000; Townsend/Otero 1999). My question is: Have they gone far enough in responding to mechanism and reductionism?

Metaphors tell their tale. The metaphor of the web is instructive. It can signify frailty - think of the delicate filaments of a spider's web caught in the dew of the early fall. As such, the web suggests the delicacy of the strands of any ecosystem - so easily disrupted by human interference. It can signify strength and security. Think of the strength and resilience of ecosystems through the ages. Think of the net that holds the falling acrobat. It can also signify entrapment. Think of the spider's web from the perspective of the fly. Think of the marginalized caught in the web of economic globalization. So, we need to be clear what our web metaphor is suggesting. Webs can be liberating; they can also be constrictive. There are positive and shadow sides to any metaphor (Heshusius 1991).

## Radical Interconnectedness: A Third Level of Presence

My proposal is not that an emphasis on interconnectedness, interdependence, and interrelatedness, as captured in the web metaphor, is misconceived - far from it - but rather that it overlooks an important element of reality or third *level of presence* that is profoundly important to a holistic or ecological worldview. Long-standing models and metaphors retain some usefulness. The billiard ball and the accompanying classic metaphors of mechanism, the building block and the clock, continue to have a rightful but limited place in our scheme of things. They represent one level of presence. I need to know a chair is a chair and that my car engine will work and can be put right if a part becomes faulty. But they fall far short of enabling us to understand human-human or human-earth relationships. Hence, the web has been proposed as a persuasive metaphor - of wider sway and significance - for understanding a second level of presence - the dynamic and interconnected nature of our world. This, I am suggesting, also has its limitations for evoking transformative earth consciousness and behaviours. I would like to propose dance (of the free-form variety) as a metaphor for the way we need

to conceive of the world at a deeper and third level of presence.

Leading-edge ecologists and quantum physicists have suggested to us that there is a world of "unbroken wholeness" or "holomovement" (Bohm 1983; 1990) underlying the world of separate things and the world of interconnections. Inspired by the web metaphor, global and environmental educators have sought to depict in curriculum programs and learning modules the complex interactions between elements of ecosystems (plants, birds, insects, humans, fungi, and so on) and between entities in the human world (individuals, communities, nation states, civic organizations). But, the overt and covert agenda of these curricular offerings still depicts the entities as primary, solid and separate (even though interconnected).

At the third level of presence, the entities are neither primary, solid or separate. The relationship becomes primary and the entity is itself a secondary manifestation.

Physicist David Bohm (1983; 1990) has described the sub-atomic world of relatively separate things (neutrons, electrons, and so on) as the "explicate order" behind which is an "implicate order", in which everything is enfolded within everything else. Bohm extrapolates from the sub-atomic world to suggest we would be wise to countenance the implicate order in our understanding of our macro world - to see that in a profound and very real way, everything is embedded in everything else and that things or objects are ontologically subordinate to flows and patterns. Everything is thus the signature of the whole. Ecologist Paul Shepard and biophysicist Harold Morowitz have said very much the same thing. From a modern perspective, says Shepard, "nature is epitomized by living objects rather than complex flow patterns of which objects are temporary formations. The landscape is a room-like collection of animated furniture [...] but it should be noted that it is best described in terms of events which constitute a field pattern" (1959, p. 505 - 506).

Or as Morowitz (1972, 156) puts it: "Viewed from the point of view of modern ecology [...] the reality of individuals is problematic because they do not exist per se but only as local perturbations in (the) universal energy flow. ... Consider a vortex in a stream of flowing water. The vortex is a structure made of an ever-changing group of water molecules. It does not exist as an entity in the classical Western sense; it exists only because of the flow of water through the stream. If the flow ceases the vortex disappears. In the same sense structures out of which biological entities are made are transient, unstable entities with constantly changing molecules dependent on a constant flow of energy to maintain form and structure."

Here are environmental philosopher Holmes Rolston III's reflections (1975, p. 122), as he stood on the shoreline of a Rocky Mountain wilderness lake: "Does not my skin resemble this lake surface? Neither lake nor self has independent being [...] Inlet waters have crossed this interface and arc now embodied within me. [...] The waters of North Inlet arc part of my circulatory system; and the more literally we take this truth the more nearly we understand it. I incarnate the solar energies that flow through this lake. No one is free-living [...] *Bios* is intrinsically symbiosis."

Entities - including ourselves - according to new physics and new ecology are momentary configurations of energy, local perturbations in a total energy field or holomovement. We emerge into the explicate, become manifest, only to re-submerge into the implicate order of being (which at one level of presence we never left). We are ephemeral manifestations of a fertile *no-thing-ness* from which all things emerge and to which all return (Zimmerman 1988, p. 22). David Bohm sees this conception of reality as closing the Cartesian bridge between mind and matter. Just as all things emerge from the holomovement, and their "existence is sustained in a constant process of unfoldment and re-enfoldment," giving rise to "their relatively stable and independent forms in the explicate order" prior to their resubmergence, so behaves mind "with its constant flow of evanescent thoughts, feelings, desires, and impulses, which flow into and out of each other, and which, in a certain sense, enfold each other" (Bohm 1990, p. 273),

Thus, at the deeper third level of presence, where the web metaphor becomes unsatisfactory, we need to consider things as expressions of the dynamic unfolding, the being and becoming, of the whole. We need to see entities - ourselves, non-human animals, rocks, nation states, civil society organizations - not first and foremost as objects but primarily as processes or dances. Phenomena (people, other-than-human lifeforms, places, countries) at this level are co-evolving manifestations of a multi-leveled and multi-dimensional dance of internal and external relationships. Global and environmental educators need to embrace the metaphor of dance, and the level of presence of unbroken wholeness it represents, in our theory and practice - while continuing to work with the metaphor of the web of relationship.

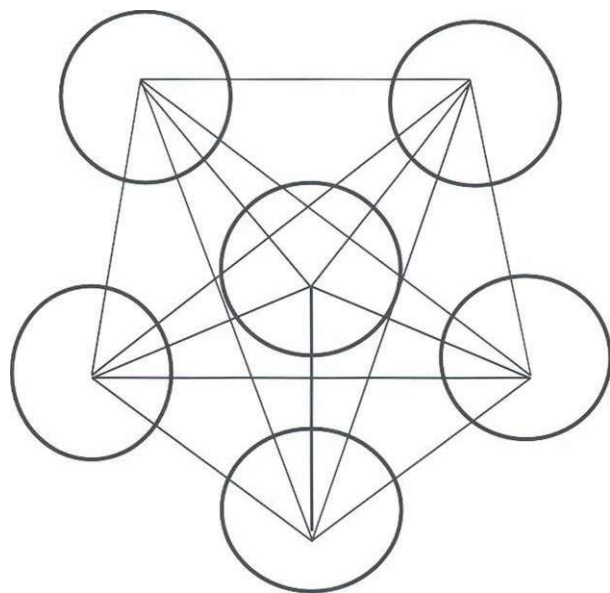


Fig. 2: Web Model

## On Individualism, Self, Altruism and Narcissism

Such a concept of radical interconnectedness helps us recall that the word *individual* has become distorted in modern times to denote she or he who is separate. It originally meant "a person undivided from the whole," a meaning arising from an intuitive and spiritual understanding that richness and uniqueness emerge from deep connectivity - that the more profoundly connected we are with the Earth and with each other then paradoxically the more we become special and distinct. As David Steindl-Rast puts it (Capra/Steindl-Rast 1992, p. 102): "The more you know a friend, the more you know that friend as unknowable." Deeper connectedness, deeper mystery. Deeper connectedness, deeper awe.

If we embrace the third level of presence and its metaphor of dance - that we are processes, not objects, expressions of a perpetual dance of inner and outer relations - we also move to a radically different conception of self. The dance suggests that the world is within us, and that in some mysterious way, we are in the world. This is what Australian environmentalist Paul Seed in part meant when he exclaimed "we are the rocks dancing!" and when he could assert that the destruction of the rainforests had become for him as painful as losing a finger. When he began to actively campaign to protect the remaining rainforests of New South Wales, he wrote: "I knew then I was no longer acting on behalf of myself or my human ideas, but on behalf of the Earth [...] on behalf of my larger self, that I was literally part of the rainforest defending herself (Seed et al. 1988, p. 6; 37).

## I am the Green Lane; the Green Lane is me

In embracing radical interconnectedness, the unending debate between working to save the Earth for prudential reasons of self-interest (e.g. arguments in favour of preserving the rainforest because unknown plants may provide cures for human disease) or for pure eco-altruism becomes rather redundant. If at a deep and equally real level, self has no boundaries, saving the rainforest is the highest self-interest in that in a profound way you know you are the rainforest, or know the rainforest is within you and making you what you are. In the same way we give new meaning to *narcissism* (excessive love of/interest in self). The "Song of Self" becomes the "Song of Earth," a fierce awareness of our short period of emergence from, but still unbroken deep connection to, the whole (Roszak 1992, p. 264). Put another way, we need to reconsider ongoing discussions concerning intrinsic value. Amongst global and environmental educators there has been a general (but not complete) embrace of the notion of self as intrinsically valuable. The argument has turned over whether we need to care for environments and other-than-human lifeforms because of their extrinsic (instrumental or utilitarian) value or because they have value in, of and to themselves. If, as quantum and

ecological theory suggest, there is a continuity of self and nature, and if self is intrinsically valuable, then nature is intrinsically valuable. There is axiological complementarity (Callicott 1985, p. 275). "If it is rational for me to act in my own best interest, and I and nature are one, then it is rational for me to act in the best interests of nature" (ibid.). The conventional separation of self and world - myself and Green Lane - cannot easily withstand the implications of a quantum/ecological worldview.

Val Plumwood (1993, p. 176 - 181) critiques deep ecological notions of expanded or oceanic self, arguing that denial of boundary demeans the independence, and devalues and disrespects difference and particularity in, the other-than-human, while enlarging and extending egoism. Such criticisms clearly require engagement but do seem to assume that egoism remains a constant, a "conventional, constricted ego" (Callcott 1985, p. 275), thus denying the leaven of axiological complementarity once the individual has consciously and mindfully embraced reality at different levels of presence, while they also overlook the dynamic and tensile interplay between the three levels within the mindful individual.

## On Embracing Instability, Uncertainty, Awe and Wonder

The quantum and ecological worldview show us that we can never know anything for sure. While the mechanistic worldview (and its educational manifestations) trades in certainties and stable understandings, a holistic worldview espouses instability and uncertainty. In a world in which, at one level of presence, everything relates to everything else, and at a deeper level, everything is embedded in everything else, we have to acknowledge that flow, movement and complexity, allied to our limited vision and inability to comprehend and entertain all the questions to ask, make for, at best, provisional knowing.

Werner Heisenberg looked into the atom and found that sub-atomic entities are unknowable in any comprehensive way. Look for the momentum of a particle and you can't know its position; establish its position and you can't be certain about its momentum (Zohar 1990, p. 10-11). Allied to that, entities within the atom simultaneously manifest themselves as particles and waves but if you measure one, you can't see and measure the other. "Nothing," writes Danah Zohar (1990, p. 11), is fixed or fully measurable, everything remains indeterminate, somewhat ghostly, and just beyond our grasp." What we observe is not nature itself, but nature exposed to the nature and limitations of our questioning. Elusiveness is a quality of world as dance.

Ilya Prigogine (1989, p. 396) asks us to think of a pendulum. If we agitate a pendulum, we can predict that it will move inexorably towards minimal then no swing with its centre of gravity as low as possible. We can be certain what will happen. But what, he asks, if we turn the pendulum on its head? It is difficult to predict what will follow. Fluctuating forces may make it fall to left or right, become entangled or even break. It

is difficult to control. The notion of the upturned pendulum, Prigogine avers, has been "ideologically suppressed" (ibid.) in that its message of instability is inconvenient for a culture that seeks to dominate and exploit nature. "In a deterministic world nature is controllable, it is an inert object susceptible to our will. If nature contains instability as an essential element, we must respect it, for we cannot predict what may happen." (ibid., p. 397).

Mainstream Western thinking has viewed - and still largely views - nature as deterministic. Nature as swinging pendulum. (There is still determinism, albeit complex, in the web). But what if we allow that nature is non-deterministic and unstable? First, we bring the internal world of the human mind (seen by the dominant Western worldview as free, non-deterministic and outside nature) and the external world of nature (seen, by that same worldview, as machine-like and deterministic) together. We subvert the mind-nature divide of Descartes.

Second, in denying certainty and recognizing our inability to control or predict, we are better able to accord respect, awe, wonder and reverence to nature. There is a close connection between embracing instability and cultivating a sense of wonder and reverence. Calling for "respect, not control," Prigogine (1989, p. 399) writes: "We need to be aware that our knowledge is still a limited window on the universe; because of instability we must abandon the dream of total knowledge of the universe."

Instability and radical interconnectedness are themselves in perpetual dance. Whenever nature, the world, a particular environmental or social situation moves closer to dis-equilibrium, the wider and more coherent the range of forces necessary to bring the situation to a new level of (complexified) equilibrium (Capra 1996, p. 181). Whenever a situation becomes static and moribund, the web and dance are there to restore dynamism. We can speculate that we would have a much less connected world if everything were in constant balance just as we would have less exciting human minds and psyches in a world lacking natural and cultural diversity.

All this, I suggest, makes me worry about global and environmental educators who continue to genuflect at the altar of "balance". What kind of balance do they have in mind between forces that are profoundly unequal and voices that are unequally heard, in a world that is out of kilter? Is balance an appropriate objective if the overall goal is transformation? *Or should we encourage tilt towards the dis-equilibrium that will effect radical change leading to new, more complex, configurations within a new equilibrium?* Disequilibrium is probably a pre-requisite of holistic, global and transformative perception. "Coherence far from a state of equilibrium acquires huge dimensions in comparison with what happens in a state of equilibrium. In equilibrium each molecule can only see its immediate neighbours. Out of equilibrium the system can see the totality of the system. One could almost say that matter in equilibrium is blind, and out of equilibrium starts to see." (Prigogine, 1989,399).



## Educational Implications of Radical Interconnectedness

So, what does the radical interconnectedness of the dance have to say to global and environmental educators?

*Radical interconnectedness suggests that we take a "both/and" as against an "either/or" approach to the ongoing debate between those who think our environmental education should be locally/bio-regionally focused and those calling for a global focus.*

David Orr, Madhu Prakash, and others have called for place-based environmental education and have discounted globally-framed and global environmental education as outside our experience and beyond our knowledge. Prakash (1994, p. 51) has argued that we can't "know" the globe except by reducing the whole to statistics, as it's too big. Orr (1992, p. 131) argues too that you can only know and appreciate what is really close, but concedes that place-oriented environmental education can be „inherently parochial and narrowing." These thinkers not only seem to harbour questionable mechanistic understandings regarding what it means to "know" but also posit local and global as dichotomies. False dichotomies. Local and global are embedded or nested in each other. Both web and dance are everywhere. My Green Lane experience was and remains both a local and global (a glocal) experience. As global and environmental educators, we need to allow both web and dance to inform our conceptual frameworks, as well as the learning programs and learning experiences we offer.

*We should help students move beyond the mechanistic sense of the individual that mainstream Western culture propagates.*

Too much environmental and global education has been outer-directed (looking out on the world) and has denied interiority (inner journeying). The hidden agenda of this tendency is to collude with mechanism by implying that our inner self is outside the universe. (The English word "environment" is itself problematic here - that which surrounds, but, by implication, is not, and does not include, us!)

Through appropriate topics and methodologies, we need to help those in our learning communities know and experience at one and the same time the discrete self, the relational self, and the dancing self. In Western education, we are very good at the first, weak at the second (despite the best efforts of global, environmental, holistic and transformative educators), and are usually blind to or ignore the third. This speaks, for example, to working with relational modes of knowing that would help us to recognize our inner connectivities (the embedded nature of body, mind, emotions and spirit) and our deep connectivities with each other and with nature. It would

also mean introducing new modalities enabling students to explore their inner ecology, to cultivate their attunement to their senses and body rhythms, and thus, to develop an embodied relationship to nature - contemplative and therapeutic art, artful self enquiry, dance, deep breathing exercises, yoga, meditation, relaxation, peer reflexology would all become valued features of a truly global learning process (Houston 1982; Liebmann 1986; Lipsett 2001; Macy 1991; Miller 2000; Nakagawa 2000; Nhal Hanh 1990; 1992; Selby 1996).

These modalities of inner journeying clear the clutter of explicate reality, limit or stop thought, bring together the physical, mental and emotional aspects of our being, and can create an awareness of the oneness of everything. They are ways to meet the dancing self. Many of us have experienced that occasional sense of self as oceanic - from the thrill of climbing a mountain, of weaving the waters of a difficult rivet in a canoe to other manifestations of what Abraham Maslow (1985) calls "peak experiences" such as T.S. Eliot's "moment in a rose garden." But here the suggestion is that we cultivate contexts and opportunities for such experiences within our formal learning programs. Beginning will be difficult but this is a kind, not all or nothing, philosophy. We can feel good about small beginnings - for what we are doing is difficult and countercultural - knowing that the ripples will go where they will and remembering that what happens somewhere is in a strange way, happening everywhere.

The inner journeying modalities also speak to mindful, still and slow learning as a counterbalance to the packaged rush and treadmill of transmissional/mechanistic learning and the usually pacy quality of much learner-centred learning. Slow learning is also an attunement to the pace of nature. "The natural world is really slow. Save for the waving of trees in the wind, or the occasional animal movement, things barely happen at all. To experience nature, to feel its subtleties, requires human perceptual ability that is capable of slowness. It requires that human beings approach experience with patience and calm." (Mander 1991, p. 86).

As Krishna says in *The Bhagavad Gita* (6: 24 - 31): "When all desires are peace and the mind, withdrawing within, gathers the multitudinous straying senses into harmony of recollection. Then, with reason armed with resolution, let the seeker quietly lead the mind into spirit, and let all his [sic!] thoughts be silence. [...] He sees himself in the heart of all beings and he sees all beings in his heart [sic!]." (Mascaro, 1982).

If this sounds like spirituality in the curriculum, that would be an appropriate conclusion. It is unlikely that environmental and global education can ever impact our culture unless we embrace a radical interconnectedness that revives mystery, a sense of the ineffable, the unknowable. A common deep ecological reading is that spirituality is a recognizing of deeper levels of connection within ourselves and between ourselves and the world. Theodore Roszak (1992, p. 45; 63) suggests that there is no likely way to return to planetary and societal health unless we heal the dichotomy between psyche and nature born of industrialism and seventeenth-century mechanistic science. He adds: "The great changes our runaway industrial civilization must make if we are to keep the planet healthy will not come by the force of reason alone or the influence of fact. Rather, they will come by way of psycholo-

gical transformation. What the earth requires will have to make itself felt within us as if it were our own private desire. Facts and figures, reason and logic can show us the errors of our present ways; they can delineate the risks we run. But they cannot motivate, they cannot teach a better way to live. That must be born from inside our own convictions. And that birth may have to be a painful one" (ibid., p. 47).

As an afterword on the nature of self, I would like to make the likely controversial suggestion that we bring death into the curriculum. Death denial is, perhaps, a central aspect of our planetary crisis. We buy and consume and rush for seeming immortality. As Susan Griffin (1995, p. 51 -52) puts it: "Fragmentation creates a temporary reprieve from the fear of death and loss. But it also creates its own grievous sense of death and loss. [...] In dividing itself from mortality, the European psyche dulls its own experience of the world."

If we wish school-age or adult learners to see themselves at one level of presence as processes or perturbances in the energy field, then the return to the implicate order is something we need to talk about and reflect upon. The cycles of birth and death arc central to an ecological perspective. How to do this - within a dominant death denial culture - is something we need to address (and in multiple and complex ways given environmental, socio-economic and cultural diversity).

### *Radical interconnectedness calls for multi-dimensional ways of knowing.*

Transformative global, environmental (especially ecofeminist), and holistic educators have been to the fore in trying to move learning away from an over-emphasis upon reason, thought, analysis, and objectivity (Russell/Bell 1996; Selby 1996). Inspired by the metaphor of the web, they have called for intuition (the ability to be immediately sensitive to the whole), synthesis, the sharing of subjectivities, and relational sensibility to be accepted as equally valid ways of knowing. But, perhaps in deference to prevailing culture, we have not pushed these ideas with the conviction we might have brought to bear. The dance metaphor calls for a thorough reclaiming of emotion, subjectivity, bodily sensibility, intuition, empathy, caring and compassion, love, and relational and spiritual sensibility as means of knowing (Russell/Bell 1996; Miller 1993; 2000; Selby 1996).

In seeking multi-dimensional ways of knowing, let me add a caution against computers. Computers, we are often told with almost hysterical fervour, can connect us to the world. As one advocate (cited in Maxwell, 1999) exhorts: "Let's put a computer in every home and every classroom [...] Let's connect Canadians of every age, race, and gender to each other and to the rest of the planet." Yet it is important to recognize that computers offer a disembodied form of connectivity that denies physicality, compresses emotions through a cognitive prism, cushions us from direct experience of others and the outdoors, and ignores spirituality (Maxwell 1999). A radical rendition of interconnectedness would resist the onward rush to dot-com the learning community. While computers have their uses we should recognize that they are amongst the latest technical phenomena in the process of disconnecting humans from nature. We should see them for

what they are - machines that have their uses. They are no substitute for lived and embodied connectedness with nature and people. It is significant that, while we understand "media literacy" as the ability to critically deconstruct and decode media of various kinds, we are becoming conditioned to interpret "computer literacy" as the ability to use computers efficiently (while relating to them uncritically). We need education for the biosphere, not for the "bitesphere".

### *Radical interconnectedness suggests that environmental and global educators recognize that they are part of a wider community of counter-cultural and liberationist educators and that coalitions and alliances are necessary.*

Although alliance building between environmental, development, health, humane, human rights, and peace educators as well as educators working against discrimination has been central to transformative varieties of global education (Goldstein/Selby 2000), it remains the case that liberal/technocratic proponents of global education (Selby 1999, p. 126 - 128) and the majority of environmental educators have been shy of actively and concretely recognizing that they are part of a community of educators seeking environmental and social justice and non-violent change. For instance, peace education has long identified "environmental damage" as a problem of peace and "ecological balance" as a value underlying peace (Hicks 1988; Smith/Carson 1998), but the concepts, models and theories of peace education have found little space within environmental education discourse. With some notable ecofeminist exceptions (for instance: Bell/Russell 1999; Donovan 1993), environmental and global education have largely shied away from creative engagement with humane education with its emphasis on animal-related issues, challenging anthropocentrism, and exploring the correlation of human and non-human oppressions. Soul sisters have barely talked and the majority of global and environmental education that have fought shy of engagement (Selby, 1995). Also, most environmental educators, colluding with Cartesian nature/culture divide, have failed to seriously engage with multicultural education by recognizing the interplay of different cultural perspectives around understandings of environment and environmental issues (Running Grass, 1996). Biodiversity and cultural diversity have not danced together. Preservation of biosphere and preservation of ethnosphere (Davis 2000, A 15) have not coalesced in environmental education's learning and teaching programs. Finally, save at the cutting edge (Russell/Bell 1996; Russell/Bell/Fawcett 2000), environmental education has not combined with anti-discriminatory education to any extent. Environmental issues are very much social justice issues if people of a different gender, and/or belonging to different racial and ethnic groups, contribute to, or feel the effects of, environmental despoilation differentially (Lousley 1998, p. 27).

The radical interconnectedness of the dance suggests that the respective fields are mutually enfolded. We need to see each field as one among a "network of pearls" as in this passage from the *Avatamsaka Sutra* (cited in Pike/Selby 1995, p. 13):

Metaphors	Underlying Concepts	Curriculum	Process
<b>Building Block/Clock</b>	<ul style="list-style-type: none"> <li>• Separateness</li> <li>• Fragmentation</li> <li>• Compartmentalism</li> <li>• Linear Connection</li> </ul>	<ul style="list-style-type: none"> <li>• Subjects</li> <li>• Disciplines</li> <li>• Arts/Sciences Duality</li> </ul>	<ul style="list-style-type: none"> <li>• Individualized, Competitive Learning</li> <li>• Machine-Image Education[Input-Output]</li> <li>• Fast Learning</li> </ul>
<b>Web</b>	<ul style="list-style-type: none"> <li>• Interconnection</li> <li>• Interdependence</li> <li>• Interrelationship</li> </ul>	<ul style="list-style-type: none"> <li>• Integration</li> <li>• Interdisciplinary</li> </ul>	<ul style="list-style-type: none"> <li>• Cooperative, Interactive Learning</li> <li>• Children [Not Child] Centered</li> <li>• Mixed-Paced Learning</li> </ul>
<b>Dance</b>	<ul style="list-style-type: none"> <li>• Embeddedness</li> <li>• Enfoldment</li> <li>• Interpenetration</li> </ul>	<ul style="list-style-type: none"> <li>• Other-Than-Disciplinary</li> <li>• Experience</li> </ul>	<ul style="list-style-type: none"> <li>• Empathetic, Embodied Learning</li> <li>• Spiritual Learning</li> <li>• Slow Learning</li> </ul>

Fig. 3: Summary of the the underlying concepts, and curricular and learning process implications of the billiard ball/building block/clock, web, and dance metaphors

"In the heaven of Indra, there is said to be a network of pearls so arranged that if you look at one you see all the others reflected in it. In the same way each object in the world is not merely itself but involves every other object, and in fact IS everything else."

As a basis for broadening the community of liberationist and counter-cultural educators, it is important that we recognize, as ecofeminist educators and transformative humane educators have (Russell/Bell 1996; Selby 1995), that oppressions are not only mutually reinforcing but also that their dynamics are similar - whether the oppression is of women, ethnic or sexual minorities, environments, or animals. The oppressors treat the object of the oppression as "other" and proceed (Plumwood 1993; 1996) to:

- *radically exclude* - creating sharp boundaries and maximum separation of identity between themselves and the "other" as seeming justification and reconfirmation of superiority;

- *homogenize or stereotype* - hence disregarding or denying difference and diversity in characteristics, motivations, tendencies, and perspectives among the "other";

- *inessentialize* - denying dependency on, and back-grounding, the "other";

- *incorporate* - defining only in relationship to themselves, and denying the intrinsic needs and independent agency, creation of value, and motivations, of the "other" ("Humanity is male and man defines woman not in herself but as relative to him." - Simone de Beauvoir; cit. in Plumwood 1996);

- *instrumentalize* - denying any value in the "other" beyond its usefulness to the perceiver.

*Radical interconnectedness suggests that we need to rethink how we try to bring about educational change.*

Our approaches to change have been wedded to mechanism. We have opted for restricted change focuses (e.g., developing a global or environmental pack or program for a specific grade and school subject; reduce, re-use and recycle programs, an international exchange program, schoolyard naturalization) when our ecological understanding tells us

that change is about strength/resilience through diverse, yet connected, initiatives, coalitions and partnerships, and dynamic and synergistic interplays between different change impulses (Selby 2000b). Change, in short, has to be holistic to be effective. A challenge we face, given the marginality of the fields of global and environmental education, is how to mount the kind of holistic, multi-faceted change initiatives our hearts and minds tell us are essential if we are to have sustained impact on educational institutions and systems and if we are to remain faithful to ecological principles and processes of change.

## Endword

Radical means going to the roots of things. We have to deeply ask ourselves whether we are about reform (which may simply buttress attitudes and structures that are at the root of the global ecological and social crisis) or transformation. We have to ask whether our aim is to tamper with or turn around. In a more sophisticated and contemporary version of the Hanns Christian Anderson "king is in the altogether" story, Douglas Adams wrote in *The Hitchhiker's Guide to the Galaxy* (1979, 119) that: "It is an important popular fact that things are not always what they seem. For instance, on the planet Earth, man had always assumed that he was more intelligent than dolphins, because he had achieved so much - the wheel, New York, war, and so on - whilst all the dolphins had ever done was muck about in the water and have a good time. But conversely, the dolphins had always believed that they were more intelligent than man - for precisely the same reasons."

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