THE NATURE OF ECOLOGY, CHRISTIANITY AND TRANSFORMATIVE EDUCATION

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ABSTRACT

The author first explores the foundations of ecology from a historical perspective with the intent to arrive at a workable definition of a postmodern ecology of association. This interdisciplinary project then undertakes a brief overview of the ecological-spiritual domain that relates to Christianity. A major emphasis of this project is a partial critical review of various problematic areas found within Thomas Berry’s *The Dream of the Earth* (1988) and *The Great Work* (1999), and Berry and Swimme’s *The Universe Story* (1992). The author also considers the implications that an ecological-spiritual integration based on this work has for adult education focusing on the integral transformative learning approach of Edmund O’Sullivan (1999, 2002). From a position of challenging the emerging earth-based spirituality within the Christian faith, the focus is on controversial themes related to universalism, materialistic unity, organicism, equilibrium, systems thinking, hierarchies, progressive evolution and integral development. Drawing on resources including environmental history and political ecology, the analysis unveils inherent weaknesses in the integration of ecology, Christianity and transformative education. From a postmodern critique of critique, the paper contrasts modern scientific rationality and universality with faith and difference and considers two alternative interpretive approaches to transformative education: a postmodern ecology of association and a postcolonial model of coexistence constituting a postmodernism of resistance.
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Like the living mosaic of a mixed forest or an urban city, the science of ecology is a protean concept that can be read historically. More than many other fields, ecology has integrated other sciences as well as other disciplines including philosophy, social sciences, economics, anthropology and religion. In recent times, science, specifically ecology, has influenced and changed spiritual thinking as is evident in some of the emerging Christian eco-spiritual perspectives. Today there is a growing concern that science alone is not adequate to solve the countless crises that humanity and our co-inhabitants face living on planet earth. There is a call to disrupt Cartesian dualisms and integrate both objective and subjective knowledge with the hope of making this world a more environmentally-friendly and peaceful place. To that end, the relationships between spirituality and ecology in the context of adult education must be equitable informing one another rather than being antagonistic.

For this project, section 1 will explore the foundations of ecology from a historical perspective with the intent to arrive at a workable definition. In section 2, I will undertake a brief overview of the ecological-spiritual domain that relates to Christian ecology. I will then focus on a critical review of Thomas Berry’s *The Dream of the Earth* (1988) and *The Great Work* (1999), and Berry and Swimme’s *The Universe Story* (1992). Section 3, will consider the implications that an ecological-spiritual integration based on this work has for transformative education following the work of Edmund O’Sullivan (1999, 2002).

From a position of challenging the emerging materialist, earth-based spirituality within Christian ecology, I will focus on specific problems of integrating ecology, spirituality, and adult education and offer suggestions for future direction. My goal is to discover how ecological thinking has influenced Christianity and to consider two alternative interpretive approaches: a postmodern ecology of association and a postcolonial model of coexistence.
Prior to the advent of modern science, various premodern cultures developed what is now referred to as traditional ecological knowledge where mytho-poetic stories illustrated that “religion, art and ecology are one” (Berkes, 1999, p.7). In Europe, during the premodern era, culture and nature were also integrated and it was not until the age of Enlightenment that ethics, aesthetics and science became differentiated into distinct spheres. Science gradually became the preferred way modern people acquired knowledge about the world while morality and art became subordinated. Because Western science has its roots in Greek and European culture, Greek philosophers, such as Plato and Aristotle, were among the many individuals who have shaped scientific thinking and the natural and social environments that have developed over time. Since then, there has been an ongoing philosophical debate between realism and idealism; between what is and what ought to be. As part of this ongoing debate and for the purposes of this project, the first section will provide a synopsis with inherent limitations of the history of ecological thinking in modern and postmodern times.

**The Nature of Ecology**

It is necessary to reiterate the connections between the making and evolution of nature and the making and evolution of the discourses and practices through which nature is historically produced and known.

Arturo Escobar, 1996, p. 46
Darwinian Ecology

During the Victorian era, Darwin stood out head and shoulders above anyone else as the quintessential ecological thinker of his time with his theory of evolution by natural selection. In fact, he has been considered the last of the great natural history generalists. Darwin had been greatly influenced by earlier scientific minds such as the geographer von Humboldt and historical geologist Lyell. According to Worster (1994), Darwin’s reading of Humboldt and Lyell gave his science an ecological bias from the very beginning. From Humboldt, who wrote, “I must find out the harmony of nature,” he gained a holistic view of nature (p. 133). While Humboldt de-emphasized the role of a Creator and paid attention to the importance of natural forces in one grand vision of the Kosmos, in his later works, he repeatedly spoke of “one great whole animated by the breath of life” and “that beyond the realm of positive knowledge lies the ‘harmonious unity’ of nature accessible only to ‘the vivid and deep emotions’” (pp. 135-6). The emphasis of Humboldt’s work was to blend the principles of science with an aesthetic and spiritual sense of nature and to place “reason within the larger framework of feeling and sensibility” (p. 136). He attempted to merge Romantic nature worship and progressive scientific views, “so that science became the principle route to natural piety” (p. 137).

While absent in Humboldt’s writings, a prominent theme in Darwin’s ecological thought was the conflict and violence in nature and for this he turned to Lyell’s Principles of Geology. Lyell based his work on a radically different assumption than his predecessors. “Creation, he stated, is perpetually new: it has been in the making since God first began the process eons ago,” and as Worster (1994) explained: “Ecology must therefore become historical too; it must emulate geology by understanding the present order of plant-animal relationships as the long accumulated work of nature, not a permanent system installed once and for all by God” (p. 138). In contrast to
sudden catastrophic upheavals, Lyell opted for a gradual evolutionary change based partly on observations of the fossil record which gave rise to the principle of uniformitarianism. He also introduced a radical theme of violence into ecological studies which “raised disturbing questions about how ecological associations are determined and how unstable they might prove to be” (p. 139). Lyell’s historical geology overturned the faith in an enduring balance of nature, and his studies of migration and geological transformations portrayed a complex network of interrelations in continual flux and disturbance including humans as a natural disturber. For Lyell, nature was a continual “struggle for existence” (p. 143). As Worster (1994) summarized, Darwin’s ecological model “emphasized an individualistic conflict between competitors vying for the goods of life” (pp. 148-9).

According to Worster (1994), “Darwin’s reading of Malthus can make good claim to being the single most important event in the history of Anglo-American ecological thought” (p. 149). Malthus’ argument claimed that food grows at an arithmetic linear rate whereas population increases exponentially. Although, education and a change in culture might ameliorate human fertility, fecundity and the pressure of population increase, the Victorian age learned from Malthus the “imperious, all pervading law of nature” (p. 153). Surprisingly, Darwin simply accepted Malthus’ argument without much further thought and based all his ecological thinking on fertility, “the essential determinant of nature’s economy,” but as Worster (1994) noted, “strangely enough, he never applied the same kind of naturalistic analysis to the development of fertility that he applied elsewhere” (p. 153). Darwin observed in nature a struggle for existence which somehow proved the accuracy of the ratios. However, the problem of fertility is one of the many areas where Malthus’s argument breaks down and the ratios are shown to be flawed, except under certain conditions of ecological disturbance. Nonetheless, it seemed that Darwin
accepted Malthus’ doctrine uncritically and from his observations in South America, he assumed that the transmutation of species needed only an explanation and found the mechanism: “evolution is the product of natural selection” and now that “mysteries of mysteries” had finally been solved (p. 155). Thus, “as a consequence of his observations on geographical distribution and economic struggle in nature,” Darwin’s theory of evolution was grounded in ecology from the very beginning (p. 156).

However, as Worster (1994) explained, there was a problem with Darwin’s logic. From a traditional naturalist’s perspective, he continued to see “‘allotted places’ in nature as fixed” which contradicted the evolutionary expansion and diversification that occurred over time, and moved to correct this discrepancy with the principle of divergence. In short, “rather than competing with one another for the same economic place, offspring may work out wholly new occupations for themselves” (p. 160). Now a constantly increasing diversity of organic types had become nature’s goal; yet, despite this awareness, “competitive replacement, not divergence and tolerance, continued to dominate Darwin’s thinking” (p. 163).

This indecisiveness regarding divergence may be attributed to Darwin’s mixed education. On one hand, he gained “a static rationalism based on the model of Linnaeus, for whom nature was a neat mechanical arrangement, perfectly simple, finished, logical” while on the other hand, his sense “that nature is a growing creative, unfinished structure” he learned from Humboldt and the Romantic philosophers (p. 163). In Worster’s (1994) words, “[Darwin] was never able to reconcile the two outlooks, but muddled along in unresolved ambivalence” (p.163). For example, his tree of life metaphor was a Romantic concept that illustrated that the whole of nature is an organic unity, but he would not allow himself to surrender his belief in competitive replacement as the essence of natural selection. Given the emphasis Darwin gave to the competition for place
could not have been so credible to people living in another place and time, they were simply the products of the Victorian frame of mind.

There were other influential theorists in this era that contributed to ecological evolutionary thought. Well known for his *survival of the fittest*, Herbert Spencer (1820-1903) attempted to reconcile religion and science by integrating deism and positivism into his *System of Synthetic Philosophy*. For Spencer, the law of evolution would become the first philosophical world view to incorporate scientific knowledge in all fields of inquiry. His position was:

> Evolution is an integration of matter and concomitant dissipation of motion; during which the matter passes from a relatively indefinite, incoherent homogeneity to a relatively definite, coherent heterogeneity; and during which the retained motion undergoes a parallel transformation. (as cited in Edwards, 1967, p. 525)

Rather than Darwin’s natural selection, the primary mechanism of evolution for Spencer was Lamarck’s inheritance of acquired characteristics which he used to explain the social development of humanity as a social organism evolved from a simple state to a more complex state. Spencer also maintained that there are varying degrees of energy or force in all phenomena and that knowledge is a study “of the manifestations of the Unknowable among phenomena” (Edwards, 1967, p. 524).

As Worster (1994) noted, Haeckel, a prominent Darwinian, coined the term *oeecologie* in 1866 from *oikos*, the same root as economy, referring to the operations of the family household which was later shortened to ecology: “the science of the relations of living organisms to the external world, their habitat, customs, energies, parasites, etc” (p. 192). With the christening of the new science of ecology, a new breed of ecologists explored the field and mapped out its boundaries and thus began a new phase in the history of ecological thought. Ever since Darwin, ecology
represented a “scientific natural history” or metaphysically speaking, it was “‘a point of view,’
an integrating outlook rather than a closet specialty” (p. 203). Nonetheless, the emphasis on “the
communal life of organisms” is what gave ecology its identity: “a study of the social relations of
the natural world – sometimes called synecology” (p. 204). In other words, ecology is the
“science of communities” or more precisely, “‘the science of the development of communities’ –
their progression through succession to the climax stage” (p. 204).

Alfred North Whitehead was yet another philosopher who had a great influence on ecological
and religious thought in the early twentieth century with his process philosophy. In contrast to
the mechanistic materialism that has dominated western thinking, Whitehead “foresaw the
advent of ‘an age of reconstruction’ in science and culture” that would become, what Worster
(1994) named, “an age of organicism” (p. 317). For Whitehead, “organicism was a movement to
restore moral values to the pursuit of science” and “by emphasizing the quality of relatedness in
the natural world, it would teach mankind a new ethic of interdependence” (p. 319). Further,
religion was, for Whitehead, “the vision of something which stands beyond, behind, and within,
the passing flux of immediate things” and with his organic philosophy wanted to reconcile
science with “an older idealist tradition: the One incorporating the many” (p. 324). For Worster
(1994), the general pre-World War II consensus among ecologists reflected “nature’s grand
strategy: evolution toward greater integration” whereas, after the war, the dangers of excessive
social integration became apparent (p. 328-9). Subsequently, ecological organicism began to lose
its appeal and was eventually eclipsed, as we will soon discover, by the New Ecology.

Clementsian Ecology

By the turn of the century as the fledgling science of ecology experienced much new growth
from plant sociologists in Europe and Great Britain, it was Cowles and Clements in America, as
Worster (1994) related, “who independently created a distinctive Anglo-American school of ecological thought, known as ‘dynamic’ ecology, that remained dominant until at least the 1940’s” (p. 206). While Cowles is recognized as America’s first professional ecologist, from the testimony of his students, it was Clements who more than any other individual had a profound impact on the path ecological thought would take.

Clements’ work consisted of two interwoven threads: “the dynamics of ecological succession in the plant community and the organismic character of the plant formation” (p. 209). The course nature takes, for Clements, “is not an aimless wandering to and fro but a steady flow toward stability that can be exactly plotted by the scientist” (p. 210). Whether forest or desert, there is “a system of developmental stages that begins with a primitive, inherently unbalanced plant assemblage and ends with a complex formation in relatively permanent equilibrium with the surrounding conditions, capable of perpetuating itself forever” (p.210). In the earliest or pioneer stages, soil conditions are important, but “each succeeding community becomes ‘less controlled by soil or terrain and more by climate factors until the adult or climax is attained’. In this way, “each stage thereby readies a home for its successor” (p. 210).

According to Worster (1994), “Clements had an almost metaphysical faith that the development of vegetation must resemble the growth process of an individual plant or animal organism” and “that the climax plant formation is in fact a ‘complex organism’.” Further, “it is a unified mechanism in which the whole is greater than the sum or the parts and hence it constitutes a new organic being with novel properties” (p. 211). Ultimately, “climate determines which ‘complex organism’ among rival formations will survive in the struggle for existence,” and just as the oak tree is in the acorn, “so the climax community marches toward an automatic, predetermined fate” (p.211, italics added). Worster (1994) has made a good claim that the
probable source for Clements notion of complex organism originated in his reading of Spencer’s *Principles of Biology*, and “expected great things in the days when Comtian Spencerian positivism was almost a religion to scientists” (p. 212). Extending his concept of an organismic society to include mechanical metaphors, Spencer’s “hybrid organism, a creature half protoplasm and half locomotive” became integral to his philosophy of cosmic evolution with its “progressive differentiation . . . [and] progressive integration . . . [advancing] towards a moving equilibrium completely adjusted to environmental conditions” (p. 213). As Worster (1994) claimed: “It was the paradoxical belief of both of these men that the war of each against all for the essentials of life results in a more harmonious social or ecological organism” (p. 214).

However, not only was the climax model seen as a threat to a farmer’s livelihood, there were also several scientists who did not favour its anti-technological implications. One of the first anti-climactic advocates to take issue with Clements’ climax theory was Herbert Gleason. He did not care much for the organismic metaphor applied to plant formation. He argued that plant formations are merely “accidental groupings, each the result of unique circumstances and too loosely related to be likened to an organized being”. As Worster (1994) commented, Gleason’s (1926) essay *The Individualistic Concept of Plant Association* viewed the climax model as “a haphazard, imperfect, and shifting organization” (p. 239). We shall return to Gleasonian ecology later.

**Ecosystem Ecology**

A.G. Tansley (1871-1955), from Oxford, was another early dissenter who would not “drink from the pure milk of the Clementsian word” and often criticized the succession-climax school (Worster, 1994, p. 241). While he disagreed with the monoclimax ideal, he was mostly against
the exclusion of human activities which were always assumed to be disruptive. Basically, “Tansley did not want to accept any climax achieved by purely natural processes as an ideal for man [sic] to respect and follow,” as Worster (1994) described, “not to reestablish man [sic] as part of nature, but to put down the threat to the legitimacy of human empire posed by the natural climax theory.” For, “if there were no meaningful differences between the balance achieved by nature and that contrived by man [sic]. . . then what reasonable objection could there be to man’s [sic] rule over the biological community, or to the further extension of his empire” (p. 241)?

In other words, ecology was not meant to act as a scientific standard by which to measure human activity and that the idea of the climax ought to be replaced by some kind of environmental relativism. Despite its critics, succession-climax is an “enduring conundrum” entrenched in ecological consciousness that, according to Worster (1994), “is inextricably wrapped up in those muddled, subjective things called human values” (p. 249). Tansley sought to rid ecology of all that remained of organismic philosophy, and “purge all that was not subject to quantification and analysis, all those obscurities that had been part of its baggage at least since the romantic period” (p.301). For him, the old chestnut: “The whole is greater than the sum of its parts,” was fiction and that “wholes are in analysis nothing but the synthesized actions of the components in association” (p.301). In an attempt to do away with the fuzzy analogies of organism and community, Tansley conceived a new model of organization: the ecosystem, which helped usher in the next phase of ecological thought of an energy-economic model often called the New Ecology. It is ironic that the ecosystem model promoted what it initially tried to prevent.

Sometimes it is helpful when trying to define something to identify what it is not. In this case, ecology is not environmentalism. During the sixties, many scientists helped bring awareness to the ever increasing problems that are threatening the welfare of the planet and its inhabitants.
Rachel Carson made us aware of the problems of the presence of chemicals in food webs; Paul Ehrlich warned us about the impending population explosion initiating neo-Malthusianism; and Barry Commoner set the standard for environmental activism in politics. Together, they publicized the environmental crises and when the first Earth Day rolled around on April 22, 1970, we had somehow entered the Age of Ecology and the beginning of a cultural revolution.

One thing is certain – the public needed environmental education and ecologists had to show the way.

Specifically, it was Eugene and Howard Odum who offered a unified theory and focused on the ecosystem to bring unity to the diversity within the field of ecology. The ecosystem was, for them, the basic unit in ecology which, as Worster (1994) noted, “refers to ‘any unit that includes all the organisms (i.e. the ‘community’) in a given area interacting with the physical environment so that a flow of energy leads to clearly defined trophic structure, biotic diversity, and material cycles (i.e. exchange of materials between living and nonliving parts) within the system” (p. 364). Understanding the ecosystem, the highest of a hierarchy of levels, was to understand how the earth was organized; however, “ecosystems ultimately became, by that logic and definition, nothing more than abstractions in the minds of ecologists” (p. 366).

Moreover, in terms of life histories, Eugene Odum held that all ecosystems shared a common “strategy of development” which implied “that ecosystems were conscious beings”; whereas, Worster (1994) also noted “he meant only that ecosystems were self-organizing entities like organisms” (p. 366). While Odum might have had different ways of describing things, “he did not depart from Clements’ notion that the law of organic nature was to bring order and harmony out of the chaotic materials of existence.” For him, it was “the notion of a ‘mature ecosystem’ described in a ‘tabular model of ecological succession’” that “reached the point of homeostasis”
which was open to “measurement and mathematical modeling” (p. 366-7). In terms of human ecology, “scientist had become social planner, seeking to ‘ecologize’ all of society,” and as Worster added: “The goal of ecology, then was to study nature as a model for society” (p. 368). An obvious issue with the concept of the ecosystem was the mixed mechanistic and organismic metaphors. “Was the Earth alive or dead?” Worster asked, “Sick like an organism or malfunctioning like a machine? Did it need a physician or an engineer? Eugene Odum tried to have it both ways” (p. 370). In short, ecosystem ecology was a holistic equilibrium model based on the concept of the superorganism.

**Non-equilibrium Ecology**

However, by the end of the 20th century, the idea that nature is in a state of equilibrium, that it is balanced, ordered, and permanent, was challenged by contradictory evidence or better, by lack of evidence. Subsequently, a non-equilibrium ecology emerged which proposed that stability was not normal in nature. This new ecology, as Neumann (2005) described, “replaces assumptions of equilibrium, predictability, and permanence with instability, disequilibria, chaotic function and dynamism” (p. 63). New observations made by scientists “found no evidence of a progressive development over time,” and as Worster (1994) recounted “they found none of the criteria Eugene Odum had posited for mature ecosystems” (p. 391). Others described “a world of perturbations,” a “dynamic, fine-textured mosaic,” and the “patch” while some fence sitters preferred a “shifting-mosaic steady state”. Whatever the case, “a gradual consensus began to emerge and it stressed the naturalness of disturbance” (pp. 394-7).

From this perspective, communities emphasize “variability, spatial heterogeneity, and nonlinear causation” which is due to a system’s “resilience,” or what Neumann (2005) described
as the “ability to ‘maintain its structure and patterns of behavior in the face of disturbance’” (p. 63). Here, a disturbance such as a fire, disease, or storm is “no longer considered anomalous, or an event from which the system ‘recovers’, but rather is considered to be integral to the systems functioning” (p. 63). In fact, system’s that were once thought to be unstable were now considered highly resilient.

For Simberloff, as cited by Worster (1994), ecology must be purged of all vestiges of metaphysics and mechanistic determinism or in other words:

A genuine scientific materialism, in contrast, rejected determinism, because matter was fundamentally indeterminate and could not be wholly captured by any precise calculus. Nature was neither a simple machine nor a wispy ghost in the machine. The long war between rival metaphors was over, both were exhausted and defeated. Nature, it was now claimed followed the rules of chance, not necessity. (p. 400)

Simberloff’s ecology was “a science of probabilism” where any statement we make about the world “is a probabilistic one: a distribution of probabilities of states of the physical universe (or some part of it)” (p. 401). Suddenly, Darwin was back in the game and a turn, or return, to evolutionary ecology had begun and now ecology had to show not only why but how relationships came to be what they were.

Other concepts that relate to non-equilibrium ecology are chaos theory and complexity theory, as Neumann (2005) explained:

complexity recognizes that chance – or more correctly, an event that is the result of a series of chances each dependent on many different factors – is inherent in natural systems. Chaos theory, then, suggests that what appears as chaotic change is actually ordered, though not linear or predictable. (p. 64)
According to Hasting et al (1993), the best definition of chaos is “sensitive dependence on initial conditions” but the role of chaos in ecology has not been clearly defined because ecological thinking has been dominated by equilibrium concepts. If the hallmark of science is predicting, then the hallmark of chaos is to make sense of the inability to make long term predictions. Predictions can be made over short time scales in chaotic systems like the weather because the dynamics are deterministic, but cannot be made over the long term (pp. 2-3). Further, “chaos and stochasticity are not equivalent” whereas “systems that are stochastic are unpredictable over any time scale because of the probabilistic nature of the components” (p. 7). “Complexity, according to one interpretation, was ‘the emerging science at the edge of order and chaos’” and as Worster (1994) also noted, complex ecosystems must be conceived “as shifting patterns in the endless flux, always new, always different” (p. 412). Then, there are those that might agree with Botkin who proposed: “Nature, in the 21st century, will be a nature that we make” (as cited in Worster, 1994, p. 412).

**Postmodern Ecology**

Both chaos theory and complexity theory are often related to what some, such as Capra (2002), Gare (1995) and Spretnak (1991) would call Postmodern Science. While avoiding the pitfalls of modern science such as reductionism, mechanism, and atomism, postmodernism embraces diversity and difference. However, Marshall (2002) observed this new breed of postmodern scientists has opted to revive more appropriate ecological and social ideas rather than rejecting all metanarratives and foundational ideas. For instance, as David Griffen wrote:

> The postmodernism of this series can, by contrast, be called constructive or revisionary. It seeks to overcome the Modern worldview not by eliminating the possibility of
worldviews as such, but by constructing a postmodern worldview through a revision of modern premises. (as cited in Marshall, 2002, p. 150)

Moreover, while many postmodernists have been critical of science, there is for the postmodern scientist, “a new science, just now arising with a conception of the cosmos as a self-organizing genesis” (p. 150). Or, as Charles Birch has put it: “In a postmodern world, the new images are no longer mechanical: they are organic and ecological. The universe turns out to be less like a machine and more like a life” (as cited in Marshall, 2002, p. 151). Given that:

Postmodern Science is the science of chaos and complexity, the science of self-organization, the science of unity, organicism and holism. All this gives rise to the following conclusion. Postmodern Science is basically equivalent to the complex systems theories . . . (pp. 152)

It occurred to Marshall (2002), that this presented a contradiction:

Given the penchant for unity and generalisation and universalisation in the holistic sciences, systems theory and the New Sciences, and given the penchant for heterogeneity, fragmentation and difference in postmodernism, how can unitarians contemplate labeling holistic science or systems theory or the New Sciences as 'Postmodern'? (p. 153)

Consequently, after contrasting postmodern science with several postmodern characteristics, the verdict was “that Postmodern Science is hardly postmodern” (p. 182). In fact, Marshall (2002) suggested that systems theory in the guise of Postmodern Science exhibited intellectual imperialism and totalitarianism which is what postmodernism is rigorously against.

Most would agree that modern science is predominately mechanistic and promotes a materialistic worldview. And few would argue that what is needed is a new science based on organicism to counteract the mechanistic materialist mindset. As Marshall (2002) related:
This organicism is what Postmodern Scientists believe lies in Postmodern Science. It is also what New Scientists believe lies in the New Sciences, what holistic philosophers of nature believe lies in ecological holism, and what systems thinkers believe lies in systems science. (p. 198)

Assuming “that (in ecology at least) organicism and mechanism is probably a false dichotomy,” Marshall (2002) added that “organicism and mechanism are hardly appropriate tools to dichotomize ecological science” (p. 200). If the objectivity of organicism and mechanism is broken down so that they are virtually similar, following Marshall, in “this view, and with regards to twentieth century science, to call something organic is to invoke mechanical metaphors and to call something mechanical is to invoke organic metaphors” (p. 211). Clearly, looking ahead, it can be said “that any truly new environmentally-friendly scientific narrative might have to be post-mechanist and post-organicist” (p. 211).

Furthermore, ecology can be viewed through the lens of social nature (Bowie 2009a; 2009b). From the position that nature is socially constructed, Escobar (1996) has argued for a poststructural political ecology and proposed:

From a certain poststructural perspective (Foucaultian and Deleuzian in particular) there cannot be a materialist analysis which is not, at the same time, a discursive analysis. The poststuctural analysis of discourse is not only a linguistic theory; it is a social theory, a theory of the production of social reality which includes the analysis of representations as social facts inseperable from what is commonly thought of as “material reality.”

Poststructuralism focuses on the role of language in the construction of social reality; it treats language not as a reflection of reality but as constitutive of it. (p. 46)
For Demeritt (1998), “artifactual constructivism focuses on the powerful and productive practices of science by which the reality of nature and our socially constructed knowledge of it are produced and articulated, thereby dispelling the modern dualism on which the debate about science and social constructivism has turned” (p. 180). Moreover, Haraway’s concept of cyborg challenges the conventional wisdom of modern science and transgresses the fixed boundaries of human-environment relations where “Cyborgs are hybrid creatures, composed of organism and machine,” as Escobar (1996) explained, “not organic wholes but strategic assemblages of organic, textual, and technical components” (pp. 59-60).

Adapting Haraway, Braun (2002) described that "ecology is a discourse, not nature itself; its knowledges are at once cultural and political . . . it suggests the existence of an ordered set of statements and concepts that govern what can be known and said about nature . . . [and] that these concepts are historical and partial; rather than timeless and universal" (p. 225-6). Also, following the Heidiggerian concept that knowledge conceals as much as it reveals, according to Braun “human knowing too easily became dehistoricized and transparent, and the order of the world too easily understood as something simply discovered in the passive act of observation” (p. 16). Further, Braun related: “For Haraway – like Heidigger – what counts as nature cannot preexist its construction; when we take nature to be self-evident, we simply mistake our discursive practices for the things they seek to describe” (p. 17). In other words, it is possible to mistake our “‘ordering’ of the world with the world itself” (Braun & Castree, 2005, p. 16).

At this point, the reader is probably aware that the science of ecology is a highly ambiguous or enigmatic enterprise that eludes definition. In keeping with Kuhn’s concept of paradigm shift, it is possible to imagine that the development of ecological science has undergone a pre-paradigmatic phase with the competition between an arcadian natural history, Christian
pastoralism and the imperial Linnaean system transcending to Darwinian evolutionary ecology (Worster, 1994). Subsequently, in reaction to the Cartesian-Newtonian mechanistic mindset, this evolved into a normal science phase of Clements’ superorganism ecology leading to Odum’s ecosystem ecology and Lovelock’s Gaia theory which in turn has been countered by Gleason’s association community ecology. More recently, equilibrium ecology has been challenged by non-equilibrium ecology which could relate to the extraordinary science phase and a new paradigm. Here, the development of ecology may be viewed as a dialectical progression leading to a synthesis resulting from competing paradigms.

In the final pages of *Structure of Scientific Revolutions*, Kuhn (1970) sought a more refined solution to the problem of progress suggesting the relinquishment of the notion that paradigm change leads closer and closer to the truth. In his essay, he described a developmental process that was based on biological evolution: “a process that moved steadily from primitive beginnings but toward no goal” (p. 172). In contrast to Lamarck, Spencer, and the German *Naturalphilosophen*, “the abolition of that teleological kind of evolution was the most significant and least palatable of Darwin’s suggestions” (p. 172). Though, “the analogy that related the evolution of organisms to the evolution of scientific ideas can easily be pushed too far,” for Kuhn (1970), “it is very nearly perfect” and “the resolution of revolutions is the selection by conflict within the scientific community of the fittest way to practice future science” (p.172). Surely, we can’t have it both ways!

In his cogent account of science as ideology in the historical critique of scientism, Briton (1996) argued that Kuhn’s historical analysis reveals “science’s actual development to be one of ruptures and revolutions, rather than incremental evolutionary change” (p. 47). He then wrote “that a choice among these competing research paradigms can be justified if they are viewed as
logically related ‘moments’ in a dialectical progression” (p. 82). However, this is a misunderstanding considering Kuhn’s selection of evolutionary change. Further, “only with the emergence of postmodernism does the notion of a dialectical progression become problematic” and as Briton (1996) noted, “its critique calls into question the Enlightenment ideal of progress: ‘the superiority of the present over the past, the modern over the pre-modern’” (p. 83). Accordingly, I offer an example of what Briton (1996) referred to as “postmodernisms of resistance that reject analytic and dialectic reason both – due to the former’s *a priori* principles and the latter’s preordained purpose” (p. 94). Arguing against the modern root-tree dialectic, Deleuze and Guttari’s (1987) metaphor of rhizome attempted to rupture dualisms and notions of unity. Emphasizing multiplicity and interconnectivity, they suggested that evolutionary schemas were “operating immediately in the heterogeneous and jumping from one already differentiated line to another” rather than descent from lower to higher differentiation (p. 11).

Owing to the many contradictions of holism, organicism, equilibrium and unity in ecosystem ecology and Gaia theory, this author concurs with Marshall (2002) and adopts a postmodern Gleasonian ecology of the individualistic association of organisms. In an attempt to postmodernize ecology, Marshall (2002) has sought “an alternative narrative that does not rely on systems, physicalism, functionalism, anti-individualism, self-regulation or progressive evolution and which does not posit ontological unities, hierarchies or organic/mechanical balances” (p. 215). Further, he posited that a postmodern ecology:

- would appreciate ephemerality and change, dissent and disunity, atypicality and strangeness, and non-universal story-telling . . . a postmodern ecology might be anti-scientific, anti-systems, anti-hierarchical, anti-teleological, anti-foundational and inclined
towards fragmentation, heterogeneity, absence, aporia, pastiche, meaninglessness, while working toward a multidimensional exploration of Otherness. (p. 216)

Here, the notion of “anarchic patches of unrelated individuals (and groups of individuals)” resonates with postmodernism’s “pensant for pluralistic pastiche and muddled mosaic” (p. 217). It also holds “viewing the world as a plurality of heterogeneous spaces and temporalities” and “‘the uniqueness of the parts rather than the unity of a theoretical whole’” (p. 217). A postmodern alternative would also want to abolish any “orderly and hierarchical conceptualization” which lean towards “essentialism and holism in ecological science which are every bit as totalizing as reductionism” and “cohesive ‘smoothable’ emergent properties” (pp.219-220). Jettisoning both co-operation and competition which tend to glue individuals together, “will undo the unity concept in ecology by eliminating the need for intense (co-operative or competitive) relationships between all nature’s members and by breaking up the levels of biological organization” (p. 222). This suggests that there is not one immanent global ecological catastrophe just waiting to happen, but that there are multiple local disasters happening daily and that such an abstract big picture actually devalues the environmental degradation that is already taking place.

While freed from any top down control working within an overarching ideological ecological whole, the individual becomes the only important agent with any theoretical and normative relevance. As Marshall (2002) declared “while the cohesive identity of the autonomous Modernist subject may be pronounced dead, ‘the postmodern individual is still very much alive’” (p. 223). Although such a deconstruction of nature might offer “philosophical support for natural selection (which is founded upon the sanctity of the individual as being the basis of the selection process),” individual organisms may be seen as more pluralistic than genetics has allowed (p.
223-4). This plurality of an ecological self in non-humans seems to resonate with “Rosenau’s postmodern human individuals, submitting ‘to a multitude of juxtaposed logics, all in a perpetual movement without possibility of permanent resolution or reconciliation’” (as cited in Marshall 2002, p. 225). A postmodern ecology of Gleasonian associationism “would place emphasis on respecting the individual Other as arbiter of its own reality without imposing metaphysical imperialism under the guise of organic unity” (p. 226). We will explore these themes further in Section 2 and 3.

Ecology and Christianity

It’s all a question of story. We are in trouble just now because we do not have a good story. We are in between stories. The old story, the account of how the world came to be and how we fit into it is no longer effective. Yet we have not learned the new story.

Thomas Berry, *The Dream of the Earth*, p. 123

In the previous section, we have seen how the theories of ecology and evolution are inextricably linked. As different ways of seeing the world continue to influence the transition toward new paradigms that lay beyond the boundaries of modern science and traditional religion, we have seen the historical role that evolution and ecology have played in this change – how humans view and think about the world and their relations with it and each other will affect how nature is cared for.

There are many, like Berkes (1999), who feel that “ecology occupies a unique position” where, as we have seen, “the more holistic approaches in ecology provide a new vision of the earth as an ecosystem of interconnected relationships in which humans are part of the web of
life” (p. 164). As a result, Berkes proposed that the question Theodore Roszak asked in 1972 is still relevant: “Which will ecology be, the last of the old sciences or the first of the new?” (p.164). However, not every ecologist would be comfortable with Gregory Bateson’s restoration of the “unity of mind and nature” or, for that matter, with Thomas Berry’s claim that ecology is “discovering a new version of the ‘enchanted world’ that was part of the natural mind for most of human history” (pp. 164-5). While deficient in modern science yet flourishing in traditional ecological knowledge (TEK), Berkes (1999) noted that “it is not surprising that many of the thinkers of alternative visions (such as Leopold) incorporate a component of value, wisdom, ethics, or belief in environmental stewardship” which has engendered a sacred ecology (p. 164). So, without further pause, I will first critically examine the integral ecology of Thomas Berry and then attend to the conversation it is having with various streams of Christianity.

**Thomas Berry – The Dream of the Earth**

Considering the many challenges that currently preoccupy humans, cultural historian, Thomas Berry who has been referred to as a geologian or eco-theologian, opined that human-earth relations are the most basic issues concerning our future destiny. Berry, a Catholic priest of the Passionate order, was chair of the history of religions program at Fordham University and president of the American Teilhard Association. Berry also studied Asian religions while in China which later influenced his work and those whom he taught. From the opening lines of *The Dream of the Earth*, Berry (1988) maintained that humans “are returning to our native place after a long absence, meeting once again with our kin in the earth community” (p. 1). He also suggested that we are experiencing a feeling of intimacy as we are recovering a sense of presence within this earth community: “a realization that the earth community is a wilderness community
that will not be bargained with” (p. 2). While this loyalty can be seen within human activities like the environmental movement, art, poetry and music, Berry (1988) related:

one of the significant historical roles of the primal people of the world is not simply to sustain their own traditions, but to call the entire civilized world back to a more authentic mode of being. Our only hope is in a renewal of those primordial experiences out of which the shaping of our more sublime human qualities could take place. (p. 4)

In Berry’s words, “we are experiencing a postcritical naiveté, a type of presence to the earth and all its inhabitants that includes, and also transcends, the scientific understanding” (p. 4). In relation to First Nations’ intimacy with the earth, Berry (1988) claimed, “they are emerging as one of our surest guides into a viable future” (p. 5). Furthermore, in The Great Work, Berry (1999) devoted a whole chapter entitled The Wild and the Sacred to exploring these themes in greater depth.

Drawing on several different sources including environmental history and political ecology, I will present a critique of Berry’s otherwise noble endeavor to articulate this most pressing situation. In The Trouble with Wilderness, Cronon (1995) critiques the use of wilderness by environmentalists. In modern times, the historical biblical and secular themes of wilderness as “desolate,” “savage,” and “barren” have been transformed by the romantic cultural constructs of “the sublime and the frontier” (p. 3). Given that “its influence is so pervasive and, potentially, so insidious,” for Cronon (1995), wilderness “had to become sacred” and “sublime landscapes were those rare places on earth where one had more chance than elsewhere to glimpse the face of God” (p.4). Moreover, frontier nostalgia counteracted modernity:
If one saw the wild lands of the frontier as freer, truer, and more natural than other, more modern places, then one was also inclined to see the cities and factories of urban-industrial civilization as confining, false, and artificial. (p. 8)

Ironically, “wilderness came to reflect the very civilization its devotees sought to escape” and as Cronon (1995) summarized, “there is nothing natural about the concept of wilderness. It is entirely a creation of the culture that holds it dear, a product of the very history it seeks to deny” (p. 9). Consequently, “wilderness offers us the illusion that we can escape the cares and troubles of the world in which our past has ensnared us” and explains why it is “permeated with spiritual and religious values that reflect human ideals far more than the material world of physical nature.” “Wilderness,” Cronon (1995) declared, “fulfills the old romantic notion of secularizing Judeo-Christian values so as to make a new cathedral not in some petty human building but in God’s own creation, Nature itself” and conflating the sacred and the primitive:

the trouble with wilderness is that it quietly expresses and reproduces the very values its devotees seek to reject . . . embodies a dualistic vision in which the human is entirely outside the natural . . . [and] poses a serious threat to responsible environmentalism at the end of the twentieth century. (p. 12)

From a poststructural perspective, cultural geographer Bruce Braun has grappled with environmental discourses on Canada’s West Coast (Bowie, 2009a). While “the attempt by environmentalists to ‘save Clayoquot’ opened up as many issues as it resolved,” according to Braun (2002) “at the heart of the environmental imaginaries that informed many Canadian and international environmentalists working in Clayoquot Sound lay much more than what William Cronon has described as a thoroughly cultural discourse of wilderness; it was mediated by and through a discourse of indigeneity” (p. 71). As Braun noted, "the angry responses by some
environmentalists to recent ‘blasphemous’ critiques of the wilderness idea say much more about their unwillingness to take questions of justice and equality seriously than about their credentials as radical ecologists” (p. 72). Further, ”in one of the great ironies of the period, the ‘preservation’ of nature increasingly came to follow the logic of the commodity form, such that ‘ecological reserves’ were produced either as the negative image of capitalist production or as themselves highly commodified spaces” (p. 34).

Despite the support given by environmental groups to First Nations on Canada’s West Coast, for Braun (2002),"ecopolitics can very easily become merely the latest in a long line of neocolonial incorporations, where indigenous identities are defined and contained within the environmental imaginaries of European environmentalists and the postcolonial nation-state” (p. 81). Here, that nature is consigned to the past and "Native Culture is assigned to the premodern," Braun explained, "is the result of two reinforcing discourses . . . romanticism . . . [and] a discourse of indigeneity" where indigenous culture is conflated with indigenous nature (p. 86-7). Therefore "within this system of signification, the Nuu-chah-nulth can appear in only one mode: as a natural culture (‘At home in the wild’). If present in any other mode - that is, as modern, technological peoples - the region loses its identity as wilderness. It becomes, instead, a 'modified' landscape, and thus less worthy of our attention" (p. 88). Just as "a state discourse of natural resources turned on the spatial displacement of First Nations", Braun also argued that , "an environmental discourse of wilderness turns on the temporal displacement of First Nations" and that "such temporal displacements have long underwritten the hegemony of the West" (p. 88, 94-5). Braun and Cronon offer adept critiques of Berry’s underlying philosophy that challenge his assumptions of a pan-indigenous culture coupled with a romantic wilderness nostalgia.
Another significant issue was the attempt to integrate traditional ecological knowledge (TEK) with Western science that created a hybrid authority responsible for recommending forestry practices and resolving environmental disputes (Bowie, 2009a). For example, Iisaak Forest Resources developed a model of "innovative ecologically sensitive forest management" based on the strict guidelines of the Clayoquot Sound Science Panel that was a direct result of commitments made by the Nuu-chah-nulth and MacMillan Bloedel (iisaak, nd). However, as Gary Shaw explained, while this joint venture "was designed to facilitate the resumption of logging," it also placed the Nuu-chah-nulth in a position “as 'partners' in projects that continued the process of colonization” (as cited in Magnusson and K. Shaw, 2002, p. 276). While the attempt to create equality had a destabilizing effect, it did not displace the status quo, it merely integrated Nuu-chah-nulth TEK into the modern scientific ways of doing things (Bowie, 2009a).

Moreover, Shaw (2002) recognized two distinct ways of reading the Clayoquot Sound Scientific Panel's report, one "as providing a methodology for maximizing logging in a sustainable fashion . . . [as] TEK 'enriching science,' the epistemology of the liberal state . . . [where] ecosystem integrity is of economic value to the center", and the other, "as a paradigm shift, as ushering in a postmodern, inclusive, community-based economy. Ecology in this place is lived; science and TEK combine to facilitate ecosystem integrity" (p. 233). Regardless of one's perspective, though the alternative accounts of ecologists and First Nations have been effective counter-hegemonic forces hopefully initiating a more democratic system that considers responsibility in terms of our connections to the forest, on the other hand, the grafting of TEK onto the scientific tree of knowledge has further contributed to relations of neocolonialism (Bowie, 2009a). Considering the conflicts inherent in the integration of TEK and Western science, Berkes (1999) concluded “the two kinds of knowledge may be best pursued in parallel”
(p. 164). For example, disputes arising from worldview conflicts related to multinational pharmaceuticals and ethnobotanical knowledge can often result in indigenous groups being co-opted and adopting a scientific rational agenda instead of their own traditional beliefs.

Furthermore, ecology has been called the subversive science as it challenged the reductionist foundations of modern science. As early as 1964, Paul Sears wrote:

Is ecology a phase of science of limited interest and utility? Or, if taken seriously as an instrument for the long-run welfare of mankind [sic], would it endanger the assumptions and practices accepted by modern societies, whatever their doctrinal commitments? . . .

By its very nature, ecology affords a continuing critique of man’s [sic] operations within the ecosystems. (as cited in Forsyth, 2003, p. 5)

Emphasizing “a level of ‘community’ beyond simple individuals, and the establishment of a new political agenda questioning the destructiveness of human behavior,” Forsyth (2003) cautioned that ecology “does not question how its statements about ‘community’ and ‘mankind’ [sic] might pose problems for establishing universal explanations of environmental problems” (p. 5). The concern here is that the universal application of ecological principles does not take into account the differences between cultures in a pluralistic society.

**Gaia.** According to Berry (1988), “our discovery of the earth as a living organism” is a reflection of the new sensitivity to nature that has “finally brought us beyond a microphase perception into a larger macrophase awareness that the entire planet is a single organic reality that needs to be addressed in its spirit and person qualities as well as its physical aspects” (p. 18). Combining cosmological principles of the East with Western science, the cosmic forces of compassion and intimacy foster the creative process. In Berry’s words, Gaia is the culmination of “ancient mythic insight” and “our modern scientific perceptions” comprising of “the geosphere,
the hydrosphere, the atmosphere, the biosphere, and the noosphere” (p. 19). Recently represented by James Lovelock and others, the concept of Gaia – that the world is one big interrelated whole ecosystem or sacred Mother Earth – has been around a long time at the periphery of Western thought beginning with Plato’s “soul of the world” or *anima mundi*. Berry (1988) added:

> This reenchantment with the earth as a living reality is the condition for our rescue of the earth from the impending destruction that we are imposing upon it. To carry this out effectively, we must now, in a sense, reinvent the human as species within the community of life species. Our sense of reality and of value must consciously shift from an anthropocentric to a biocentric norm of reference. (p. 21)

While it has been claimed that the Gaia theory is the latest incarnation of Clements’ concept of a superorganism, Marshall (2002) has added that “it is a theory of high technology, a theory of imperialism and a theory that is hostile to socially-aware environmentally policy-making” which is a “technocentric embodiment of the unity of nature” (p. 53).

Drawing on Ken Wilber’s critique of ecological spirituality, Michael Zimmerman (nd) also challenged spiritually-oriented deep ecologists’ belief in Gaia, arguing that they “may not provide the understanding of spirit, humankind or nature necessary for resolving global ecological problems” (para. 5). Calling for a restoration of spirituality in the postmodern world, yet preserving the perennial philosophy of the past ages, Zimmerman echoed Wilber’s critique of radical environmentalists’ one dimensional, *flatland* ontology that is void of spirituality. Wilber, like Heidegger, contended that “the monological vision of mechanistic materialism” as Zimmerman noted “amounts to an industrial ontology” (Beyond Flatland Ontology section, para. 6). Thus, for Wilber: “The religion of Gaia, the worship of nature, is simply one of the main forms of industrial religion, of industrial spirituality, and it perpetuates the industrial paradigm”
(as cited in Zimmerman, Beyond Flatland Ontology section, para. 6). While I do not agree entirely with Zimmerman’s and Wilber’s spirituality, this critique must be taken seriously.

The new story and creative energy. Another theme in Berry’s work that warrants attention is creative energy. Just as a photon particle can be perceived over time as an energy event, Berry (1988) also wrote of energy as our primary experience where “the universe can be seen as a single, if multiform, energy event,” (p.24). Further, he suggested that the primary basis of Western spiritual tradition is the belief in a personal creative energy principle with power as its distinguishing characteristic. For Berry, a present problem here in the West is the “division into a secular scientific community which is concerned with creative energies and a religious community which is concerned with redemptive energies” (p. 25).

Creation stories of earlier times served as the personal and social context for a diversity of cultures which “were energy expressions recognized primarily as subjective and psychic rather than physical in nature” where a “truly great society was the society of the divine, the natural, and the human” (p. 25). This premodern energy structure was radically disrupted in the modern period and created a “new axis for the expression of energy” as Berry (1988) noted, producing a shift “toward some ultimate fulfillment within the historical order” (p. 27). In effect: “The very purpose of this new energy was not to maintain the existing system nor to spiritually transcend the natural systems, but to change the system in its deepest meaning and the entire modality of its functioning” (p. 28).

In the Western world, the new scientific enterprise began by Bacon, Galileo, Descartes and Newton “was less concerned with such psychic energies than with physical forces” that could be harnessed to serve our own self-interests. In this new objective world, science and technology “became the modern substitutes for the mystical vision of divine reality,” where the “historical
drive of Western society toward a millennium of earthly beatitude was driven not by divine grace but by human effort” (p. 40). Thus, the technological age was a revolution of both physical and psychic energies that was associated with social and political transformation altering the very structure of existence. As Berry (1999) proclaimed: “With the rise of the modern sciences we began to think of the universe as a collection of objects rather than a communion of subjects” (p. 16). For Berry, this is the story of Western civilization.

“The excessive analytic phase of science is over” according to Berry (1988) and the “countermovement toward integration and interior subjective processes is taking place within a more comprehensive vision of the entire universe” (p. 37-8). He also conveyed a longing for a communion with nature and a return to a prior world “sustained by a cosmic presence” arising in human consciousness from the earth process where once the “sense of an all-pervasive, numinous, or sacred power gave life a deep security” (p. 39). Essentially, for Berry, “we need to alter our commitment from an industrial wonderland achieved by plundering processes to an integral earth community based on a mutually enhancing human-earth relationship” (p. 30). This “ecological vision,” Berry related, “is the only context that is consistent with the evolutionary processes that brought the earth and all its living beings into a state of florescence that existed prior to the industrial age” (p. 30). Given “the mythic power of the industrial vision” in conjunction with its obvious desolation, Berry proposed “a more-adequate elaboration of the mythic phase of the ecological process” (p. 30). As a counter to the industrial mystique, Berry envisioned a “commitment to the earth as an irreversible process, to the ecological age as the only viable form of the millennium ideal, and to the sense of progress that includes the natural as well as the human world” (p. 33). While “neither a romanticism nor an idealism,” this new ecological energy that is emerging in all walks of life “is rather a deep insight into the structure
and functioning of the entire earth process” which “finds its most effective expression in the great story of the universe” (p. 33-4). This new historical era, the ecological age, or what Berry and Swimme (1994) named the Ecozoic period, is not just an adaptation or mitigation of energy resources, a modification of social and economic conditions, or educational reform, “it is a radical change in our mode of consciousness” (p. 42). Once recognized by intuition and now understood by scientific reasoning, the ecological age must now energize the principles of differentiation, subjectivity, and communion (p. 45).

Focusing on the American experience, Berry (1988) described the sense of destiny in bringing about a universal millennial age. While he identified specific difficulties with a transcendent deity and eternal salvation separate from the natural world, it is the millennial doctrine that is most significant. Particularly, “when this millennial age did not appear by divine grace, the American people felt an obligation to raise it up” (p. 115). It is worth quoting Berry at length here:

This is the original dynamism of American political and economic life. It also provided the deeper inspiration of science and technology. Commercial and political programs as well as universal education were all means to millennial transformation of the earth. Just as the doctrine of divine transience took away the pervasive divine presence to the natural world, so the millennial vision of a blessed future left all present modes of existence in a degraded status. All things were in an unholy condition. Everything needed to be transformed. . . Nothing in its natural state was acceptable. (p. 115)

Although the idea of pristine wilderness as divine presence has long been part of the American ethos, materialism and the pursuit of the American Dream have prevailed paving the way for consumerism.
If I am reading Berry correctly, the human expectations of the millennium ideal have resulted in the devastation of the planet. According to Berry (1988), the prophetic visions of the millennium found in Daniel and the apostle John’s Revelations are “what may be the most powerful psychic energies ever released on the earth” (p. 28). Whether Berry believed that biblical prophecy and the psychic are the same or used some other interpretation, either way, this is problematic. For most Christians, true biblical prophecy is a word of the Lord and can never be equated with psychic or human creative energy. Berry also wrote that the millennium has already appeared as the industrial wonderland, yet claimed “the ecological age as the only viable form of the millennial ideal” (p. 33). Moreover, Berry has neglected to mention the period of the great tribulation immediately preceding the millennium. While there are debates concerning when and how it will come, many Christians would agree that the millennium is the thousand year reign of Jesus Christ on earth following the great tribulation when the dragon is chained and is a time of peace and justice, but it has nothing to do with human ideals or psychic energy. I find Berry unclear regarding his eschatology and propose that his dependence on a millennium ideal is misguided and unwarranted.

**Dominion**

A major factor in human-earth relationships is the interpretation of *dominion* as written in Genisis 1:26, 28. Like Berry, Jeremy Rifkin (1979) related that “an overemphasis on ‘otherworldliness’ has led to disregard and even exploitation of the physical world” (p. 245). Rifkin also wrote:

The concept of dominion has been used by people to justify the ruthless manipulation and exploitation of nature. Now, for the first time, evangelical scholars are beginning to
redefine the meaning of dominion, and in so doing, they are creating the theological foundations for a steady-state world view. (p. 245)

Moreover, he added that “anything that exploits or harms God’s creation is sinful and an act of rebellion” and that a “Christian life, then, must be one of conserving order out of chaos, wholeness over fragmentation, balance over imbalance, and harmony over disharmony” (pp. 245-6). “Dominion, then, does not mean the right to exploit nature,” Rifkin noted “Dominion means stewardship over nature” (p. 246). While Genesis 2:15 recounts the human role “to tend and to keep” the garden that God planted, it does not preclude having dominion over all the earth. For Rifkin, stewardship is “the New Testament term for this role of human beings in relation to the natural order” (Barnette as cited in Rifkin, 1979, p. 246). However, a different perspective emerges when considering how the word “stewards” (οἰκονόμος which shares the same root as ecology) is actually used in the New Testament – “stewards [οἰκονόμος] of the mysteries of God (1Cor 4:1) and “as stewards [οἰκονόμος] of the manifold grace of God” (1Peter 4:10). Regarding the grace of God which is unmerited favour, Berry’s (1999) notion of “a moment of grace” as the transition period into the twenty-first century is undoubtedly not referring to the same kind of grace (p. 199). For, “God resists the proud, But gives grace to the humble” (1Peter 5:5).

I believe Berry and Rifkin are right for all the wrong reasons. While Rifkin is using ecology within the evangelical community to bring about a steady-state worldview and the second reformation, Berry attempts to synthesis the models of the secular scientific community with the religious community to create his vision of a new ecological millennium. Although there are differences between Protestant and Catholic perspectives, any movement that attempts to usher
in Jesus Christ’s thousand year reign by human effort is counterfeit. Whether taken literally or allegorically, the millennium will be a great work of God rather than *The Great Work* of humans.

**Third Industrial Revolution**

More than thirty years later, Rifkin has written a cogent account of the Third Industrial Revolution. With the global economic meltdown and peak oil, Rifkin (2011) suggested that “we are currently in the end game of Second Industrial Revolution and the oil era upon which it is based” (p. 14). Like the First and Second Industrial Revolutions:

Today, we are on the cusp of another convergence of communication technology and energy regimes. The conjoining of Internet communication technology and renewable energies is giving rise to a Third Industrial Revolution . . . The conventional top-down organization of society that characterized much of the economic, social, and political life of the fossil fuel-based industrial revolutions is giving way to distributed and collaborative relationships in the emerging green industrial era. We are in the midst of a profound shift in the way society is structured, away from hierarchical power and toward lateral power. (pp. 36-7)

Though there has been an explosion of green energy technologies such as solar, wind, geothermal, biomass and hydrogen, the recent turmoil from economic debt is thwarting the implementation of new infrastructure to support these enterprises. Nevertheless, according to Rifkin (2011), “barring some unforeseen circumstances, this is likely where society is headed” (p. 166). Consequently, this shift to a Third Industrial Revolution is forcing a change in the educational system and paving a way for biosphere consciousness. Drawing on ecopsychology and ecophilosophy, Rifkin (2011) advocated the development from the individual to an extended
ecological self and the emphatic or emotional identification with not only other lifeforms but also
the biosphere itself. While lateral learning and environmental education are salient features of
this new educational approach, for Rifkin, it seems that there is no room for God or spirituality in
the Third Industrial Revolution.

The Great Work

In a special edition of *Worldviews* devoted to Berry’s *The Great Work*, David C. Korten
(2001), suggested “three elements of the ‘great work’ that of telling the story, the creation of a
new politics, and the creation of a new economy are essential for the transformation of the
society” (p. 148). “Our future hangs on a profound choice between life and money – or in the
more biblical sense between God and Mammon” and while the love of money is the root of all
evil, for Korten (2001), “life is the foundation of all real wealth, the essence of our being, the
breath of God, a miracle of creation” (p. 149). The essence of Berry’s *The Great Work* is “both
profound and simple,” according to Korten (2001): “We must transform societies dedicated to
the love of money into societies dedicated to the love of life” (p. 151). So far, I agree with
Korten, yet, I have trouble with his thinking that God is some kind of spiritual intelligence or
energy and instead of being banished to some remote place beyond experience as in previous
centuries of Christianity, God is now integral to all creation. I question whether the new story
can heal the breach between science and religion: “torn between a theology that denies the
evidence of logic and observation and a science that denies our experience of consciousness and
spirit” (p. 151-2). I also have trouble with Korten’s, as well as Rifkin’s mentioned above,
conception of sin as that which is destructive of life. In the New Testament, it is written, “for all
have sinned and fall short of the glory of God” (Romans 3:23).
Another contributor to this *Worldviews* edition, ecofeminist theologian, Heather Eaton (2001) addressed Berry’s central thesis, “that we are ethically destitute before the severity and magnitude of the situation unless we revision the macro aspects of Western culture within a cosmological horizon” (p. 157). She also highlighted Berry’s foremost concern with the “soul of the future” as the shaping of the spirit and “the inner vision that we need if we are to make the intellectual, social, economic, religious – and ethical – adjustments required for a viable future” (p. 157). Regarding the new *problematique*, a shift in perspective is necessary because effective ecological ethics cannot emerge from an anthropocentric Euro-Western paradigm. Using Berry’s example of the Titanic, Eaton claimed: “Microphase concerns needed to give way to macrophase decisions about the whole,” and similarly, “that the concerns for the human community can be fulfilled only by a concern for the integrity of the natural world” (p. 159).

Further, Eaton (2001) cited Stephan Toulmin’s description that the momentum of modernity “will not carry us into a new and better world” and that “the continuation of modernity threatens the very survival of life on our planet” and must give way to postmodern sensibilities (as cited in Eaton, 2001, p. 160). While a macro and micro distinction is necessary, Eaton (2001) related that in Berry’s cosmology “it is unclear how deep rooted global systems would be transformed” and is perhaps why “ecofeminists deliberately choose to address the particular rather than the vast, because that is where they consider change to be most effective” (pp. 163-4). For Eaton, “the danger lies in mistaking the micro for the macro” or vice versa and that we must “address micro problems with macrophase consciousness” (p. 164-5). Recalling Einstein’s observation that “problems cannot be solved at the level of consciousness in which they were created,” if the macro or cosmological horizon is missing, “then the need for a cosmological perspective to the ecological crisis is also the need for a radical change of consciousness” (pp. 164-5). Eaton (2001)
asked and answered: “Can ethics be derived from cosmology? Possibly” (p. 165). Berry has called for an awaking to the cosmos whereas the apostle Paul wrote “awake to righteousness” (1Cor 15:34). If righteousness is absent, all else is vanity.

In the same *Worldviews* issue, biologist Ursula Goodenough (2001), questioned Berry’s “frame work of purposive, hierarchical progress of the universe” and suggested that “an alternative view is to see cosmic change as non-progressive and contingent” (p. 142). While Goodenough agreed that the mysticism of progress is problematic, she had trouble with some of the sources Berry identified. For example, she quotes what Berry wrote:

> The sense of progress as ‘control over nature’ attained by human talents was manifested in economic competition in a realm of free enterprise, an attitude derived from Darwinism that can be considered the background of the industrial and corporate control of America, . . . of the continent, and of the planet itself. (p. 142)

However, Goodenough (2001) argued “that Berry’s universe story is rife with concepts of hierarchical progress” and that “once hierarchy and progress are seen as important features of the universe story, then the notion that the universe has a purpose is not far beneath the surface” (p. 143-4). For Goodenough, contingency offers “a particularly germinative foundation for our approach to ecology” with the main focus being “the here-and-now, the inherent immanent Is-ness of the cosmos, and not the progressive transcendent vision of cosmogenisis” (p. 146).

**Ecology and Christianity**

While much of Lynn White’s argument that the ecological crises originated in Christianity has already been successfully critiqued, Berry (1988) has argued that “our ecological difficulties lay in our spirituality itself” and “could be remedied only by a more intimate human association
with the natural world” (p. 116). From this position, he distinguished between “traditional Christian spirituality, the more recent American spirituality, and the emerging spirituality that is the challenge of our present generation” (p. 110). Since, “there is no definitive Christianity” for Berry, “but only an identifiable Christian process,” now “the time has come for the most significant change that Christian spirituality has yet experienced, but this change is part of a much more comprehensive change in consciousness brought about by the discovery of the evolutionary process” (p. 116-7). Consequently, what is required is a recovery of the reverence for nature until the spirituality of the ecological age becomes efficacious. Berry (1988) proposed that one of the historical roles of our generation is initiating “the spiritual context of the ecological age, the next great cultural coding that is presently taking on its effective form” and mentioned Marilyn Ferguson’s *The Aquarian Conspiracy* as a resource (p. 119). The reference to this New Age text is enough to qualify Berry’s (1999) statement that “there is still a tendency to think of ecologists as radical, romantic, or trivial New Age types” (p. 113).

**Emergent Christianity**

In the remaining portion of this section, I would like to address this emerging spirituality, the spiritual context of the ecological age, the next great cultural coding that is the challenge of our present generation and its implications for Christianity. I draw mostly from sources that have been influenced by Berry and Swimme. Put into context, does the new story of the universe fit into Christianity?

As Tickle (2008) described in *The Great Emergence* there are three outcomes whenever major religious upheavals arise. First, a new form of Christianity emerges. Second, the dominant expression of Christianity is reconstituted into a less ossified version of its former self. Third,
there is a spreading of the faith into new areas (p. 17). While emergent Christians are postmodern and are not afraid of paradox, according to Tickle, this Great Emergence is rethinking the foundational assumptions where beliefs like “the Atonement, for example, or the tenet of an angry God who must be appeased, or the question of evil’s origins are suddenly all up for reconsideration” (p. 162). Tickle is not alone in observing that this Great Emergence “will rewrite Christian theology – and thereby North American culture” (p. 162).

Further, she asked the important question: “Where, now, is our authority?” Within the shifting sands of spirituality, the mantra – “I’m spiritual, but not religious” – can be heard echoing all around (p. 93). The *Alcoholic Anonymous* program is a prime candidate for this rebellious move away from orthodoxy. Its main point is that an addict can only be helped by God, however, not the God of the Bible, but by God as we understand Him, or a Higher Power. Consequently, not only did it deliver a serious blow to pastoral authority, it also revived the small-group dynamic. Interestingly, Berry (1988) wrote: “Mythic addictions function something like alcohol and drug addictions” (p. 32). With the new ecological age rhetoric, are we not just substituting the dualistic industrial addiction for a holistic ecological one: *ecoholism*?

Bruce Sanguin, a progressive Christian minister from Vancouver, has authored *Darwin, Divinity, And the Dance of the Cosmos: An Ecological Christianity* which raises concern that in his position as a pastor, people may be more easily persuaded and indoctrinated by his personal beliefs. For example, in reading Jesus’ parables from an ecological perspective, Sanguin (2007) teaches a *green* gospel, yet, in misappropriating scripture to support an ecological imperative, the scriptures lose their vital meaning (pp. 167-198). Another problematic area is found in his rendering of the wisdom traditions. Reading Proverbs 8: 22-33, we see that wisdom or *sophia* is created or brought forth; Sanguin, however, then unpersuasively presented Jesus of Nazareth as
Sophia’s child and the Spirit of God as the Spirit of Sophia (p. 202-213). This is clearly against accepted hermeneutical understanding that neither Jesus nor the Holy Spirit is a created being. Sanguin (2007) also wrote:

When viewed in the context of chaos theory, Jesus is not simply the presence of order fighting against the dark forces of chaos. As the anointed presence of Sophia, he is the embodiment of the universal wisdom that recognizes chaos and order as implicit within each other, as two aspects of the one creative force. He is, in this sense, the integral presence of both order and chaos. (p. 233)

Contrast this with what is written in scripture: “what communion has light with darkness” (2 Cor 6:14) or again in 1 John 1:5: “God is light and in Him there is no darkness.”

West Coast teacher, Margaret MacIntyre has wrestled with the current interface between ecology, science and religion in her book *The Cosmic Pilgrim*. Her writing is strongly influenced by the new cosmology of Berry and Swimme. She has also co-guided an eco-theology program at local churches and retreats on Vancouver Island. While her work has many insights in this area of inquiry, I want to focus on a few aspects which diverge from my own.

MacIntyre (2010) supplemented her narrative quoting Brian Swimme: “In the spirit of Aquinas, I would say that the Universe itself is the primary revelation of God, and the Universe is made in the image and likeness of God” (p. 13). This is far from the position of either scientific materialism or revealed biblical doctrine. The question is has this integration of science and Christianity resulted in a more robust field of inquiry or has it compromised and weakened both in the name of ecumenism? It is no surprise that the etymology of the word ecumenism is the same as ecology and in Webster’s (1996), it is derived from the Greek words *oikomenikos* - of or from the whole world and/or oikoumene, the inhabited world. In this sense, Berry’s *The
*Dream of the Earth* and Berry and Swimme’s *The Universe Story* can be seen as an ecumenical evolutionary ecology. In short, the new cosmology can be read as a one world religion ushering in the new ecological age.

For MacIntyre (2010), as it is for Berry and Swimme, the work of Jesuit paleontologist, Teilhard de Chardin, is essential to the new story of the universe. The notion that the material world is revelatory of the divine with no distinction between the sacred and profane was central to Teilhard’s cosmology. For Swimme, he was one of the first to “see the universe in an integral way, not just as objective matter, but as suffused with psychic or spiritual energy” (as cited in MacIntyre, 2010, p. 16). Further, Teilhard saw the pattern of a progressive development to a higher conscious form he called the law of complexity-consciousness where atoms form molecules, molecules form cells, cells form organisms becoming more complex and more conscious. (p. 17). The universe is not just empty space: “It is a unity – a unified material, spiritual organism” (p. 18). What is even more problematic is “that the direction of evolution is from matter to life to spirit to God . . . through the process of hominization” and that “by the ‘Omega Point’ Teilhard meant a Universe that had become God” (Swimme as cited in MacIntyre, 2010, pp. 156-8).

Contrary to MacIntyre, Teilhard, Swimme and Berry, for me, there is a fundamental contradiction between the God revealed by the Cosmos and the God revealed within the Judeo-Christian tradition for “God has revealed them to us through His Spirit . . . Even so no one knows the things of God except the Spirit of God” (1Cor 2:10-11). Every sentient being has a body and soul (mind, will and emotions), but humans do not inherently have the Spirit of God dwelling inside; the Spirit is given freely and must be received individually. In other words, the Spirit of Christ is eternal: “Jesus is the same yesterday, today and forever.” (Heb 13:8). The Spirit of God
is not the same as energy or consciousness and does not evolve. Thus, from my perspective as a bible-believing Christian, to say that matter and consciousness evolve to spirit and to God is fallacious and deceptive.

In sum, it is obvious that religion and science don’t easily mix. By appealing to the power of ecology and the new sciences, the proponents of the new spirituality had hoped it would provide an adequate counter-hegemonic force to the present industrial age and a sufficient means to move into an ecological age. I realize that if ecology is to be integral, then both natural and spiritual worlds should be studied together. However, for the same reasons why traditional ecological knowledge and science may be best pursued in parallel, it is my contention that we should not attempt to integrate ecology and Christianity this way. While there are points of communication and areas of overlap, I do believe that the two kinds of knowledge can effectively co-exist together. My concern is that this new story presents another gospel and may beguile believers from their faith. The new story is a good story, but there are myriad stories to choose from. What is most important is that we learn from whichever story we choose to listen to. We now make a turn to transformative education.

**Transformative Education**

The earth is the primary teacher in economics, in medicine, in law, in religion. The earth is the primary educator. Ecology is not part of economics. Economics is an extension of ecology . . . So with religion. Religion is an expression of ecology. Ecology is not primarily a teaching of religion . . . Ecology is less a subject for education than the context for education.

Thomas Berry, in O’Sullivan, 1999, p. xiv
In section 2, we have examined how science, specifically, ecology and evolution have influenced religion, in this case Christianity. Due to the pressing concerns of climate change, pollution and other environmental issues, let us now consider the role that adult education and transformative learning play in this conversation. Interestingly enough, the literacy programs in Britain and Scandinavia during the nineteenth century that taught people to read the Bible were one of the earliest references to adult education (Draper, 2001, p.15). Moreover, the Antigonish movement, a program of Canadian adult education which Father Jimmy Tompkins and his cousin Father Moses Coady began at the Extension Department of Saint Francis Xavier University in Nova Scotia to aid and organize rural farm and fishing co-operatives was also Christian-based (Lotz & Welton, 1987). The social gospel movement was also influential in the adult education promulgated by Lindeman and the YMCA in the early twentieth century (Smith, 1997, 2004). More recently, the philosophies of figures like Paulo Freire and Myles Horton were also steeped in Christian principles.

Furthermore, andragogy, a framework that “has been referred to as a theory of learning, as a philosophical position, as a political reality and a set of hypothesis,” has played an important role in the development of adult education as a professional discipline (Draper, 2001, p. 25). However, Malcolm Knowles, the leading proponent of andragogy in North America, came under heavy criticism for the promotion of andragogy as separate from pedagogy including a disproportionate focus on the characteristics of the learner and self-directed learning. Knowles later modified his model and referred “to pedagogy as the body of theory and practice on which teacher-directed learning is based and andragogy as that which is based on self-directed learning” (Draper, 2001, p. 22). As we entered the twenty-first century, transformative learning has eclipsed andragogy and transformative learning has taken center stage as the predominant
learning theory in the education of adults. After a brief review of transformation theory, I will critically examine the integral transformative learning theory of Edmund O’ Sullivan and then offer a postmodern ecology and a postcolonial model of coexistence constituting a postmodernism of resistance as a heuristic for an alternative transformative education in response to the concerns raised in sections one and two.

**Transformative Learning**

Jack Mezirow (1995) summarized an evolving transformative theory of adult learning that involves the process of making meaning of experiences and how meaning structures “are transformed through reflection, rational discourse and emancipatory action” (p. 39). These meaning structures are further differentiated into “a meaning perspective, a general frame of reference, set of schemes, worldview, or personal paradigm” that “become articulated in a meaning scheme - the specific set of beliefs, knowledge, judgment, attitude and feeling which shape a particular interpretation” (pp. 42-3). Further, “there are two different types of transformation which may be effected by reflection, everyday transformation of a meaning scheme, through reflection on content or process, and less commonly, a more profound transformation of a meaning perspective through critical reflection on premise” (p. 45). For Mezirow (1995), learning, either instrumental or communicative, “may be understood as the process of using a priori interpretation to construe a new or revised interpretation of the meaning of one’s experience in order to guide future action” (p. 49). Learning that is transformative can occur when “critical reflection on the content or process of problem solving, rational discourse and action transforms a meaning scheme . . . [or] transforms a meaning perspective” (p. 50).
The less common perspective transformation can be either incremental or epochal. A meaning perspective acts as a filter that can help interpret and give meaning to a new experience by reinforcing or expanding its boundaries. Depending on the degree of congruency, a disorienting dilemma can bring about either a resistance to assimilating a new experience or the transformation of a meaning perspective (Taylor, 1998). According to Mezirow (1996), “a more fully developed (more functional) frame of reference is one that is more (a) inclusive, (b) differentiating, (c) permeable,(d) critically reflective, and (e) integrative of experience” (p. 163). For Taylor (2008), a perspective transformation is a paradigm shift and “the revision of a frame of reference in concert with reflection on experience (p. 5).

However, Mezirow has not been without his critics and Taylor (1998) presented a cogent critical review of several unresolved issues: individual vs. social change (Collard & Law, 1989, Hart, 1990, Tennant, 1993); a decontextualized view of learning (Clark & Wilson, 1991); a universal adult learning theory (Clark & Wilson, 1991); adult development: shift or progression (Tennant, 1993, 1994); an emphasis on rationality; other ways of knowing; and the model of perspective transformation itself. As Taylor (1998) concluded, “it is these researcher’s own frame of reference in regard to the structuring of the self that prevents them from arriving at a congruent understanding of transformative learning theory” (p. 45).

Furthermore, regarding the shortcomings of transformation theory, Taylor (2008) readdressed three alternatives to Mezirow’s psychocritical perspective of transformative learning: a psychoanalytic view including the process of individuation, a Jungian self-reflection and identity (Boyd & Meyers, 1988; Dirkx, 2000); a psychodevelopmental view focused on epistemological change, relationships, and holistic ways of knowing (Daloz, 1986; Kegan, 1994); and a social-emancipatory view based on the work of Paulo Friere which advocated demythicizing reality.
and the development of a critical consciousness (pp. 7-8). In addition, Taylor (2008) identified four emerging views of transformational learning: neurobiological, cultural-spiritual, race-centric, planetary (p. 8). The later:

- takes in the totality of life’s context beyond the individual and addresses fundamental issues in the field of education as a whole. The goal of transformative education from this perspective is reorganization of the whole system (political, social, educational). It is creating a new story from one that is dysfunctional and rooted in technical-industrial values of Western Eurocentric culture, which gives little appreciation to the natural, or to an integral worldview. This view recognizes the interconnectedness among universe, planet, natural environment, human community, and personal world. Most significant is recognizing the individual not just from a social-political dimension but also from an ecological and planetary one. Transformation is not only about how we view our human counterparts; it explores how we, as humans, relate with the physical world. (pp. 9-10)

### Integral Transformative Learning

Previously, I have noted (Bowie, 2011a) that O’Sullivan (1999) emphasized how humans “are desperately in need of a planetary consciousness which will locate us within the creative processes of an unfolding universe story” along with “a unique kind of creativity for our educational ventures today” (p. 180). He then continued with a “reconstructive postmodern vision . . . that is comprehensive in scope and magnitude, to counter the destructive totalizing monological system of the market vision” (p.182). O’Sullivan also equated his transformative vision with process philosophy in order “to orient people for effective action to overcome environmental problems” and practice sustainable living to curtail the ecological crisis (p. 182).
While I support much of what O’Sullivan has envisioned such as ecological literacy and bioregional studies, it is what he did not see that troubles me. I will now offer a brief critical analysis of the problematic areas in O’Sullivan’s integral transformative learning including critical theory, scientism, systems theory, ecological and evolutionary thinking, integral development, spirituality, difference, and vision.

**Critical theory and scientism.** An overarching area that is problematic in O’Sullivan’s vision and transformative learning in general is the appeal to critical social theory and the modernist valorization of reason. While paying lip service to other ways of knowing, O’Sullivan utilizes scientific rationality in the guise of ecological/evolutionary thinking to support his integral transformative learning. However, as Briton (1996) described:

> it was the great success of the seemingly objective method of the natural sciences that precipitated the spread of scientific rationality into all aspects of life – scientism. While Habermas rejects scientism, contending that a practical communicative rationality is the only form of reason appropriate for life’s moral and political dimensions, he turns to scientific rationality to ground his project . . . [and] subordinates communicative reason to scientific reason, not only subverting the very purpose of his project but also revealing the inadequacy of his theory. (p. 91)

Although O’Sullivan (2002) has identified his vision with a reconstructive postmodernism and a penchant for postmodern science, by grounding his project in scientific rationality, it falls prey to the same criticisms as noted above by Briton. Maintaining that the dominant culture is no longer “formatively appropriate” and questioning all associated educational visions, O’Sullivan claimed that “transformative criticism suggests a radical restructuring of the dominant culture and a fundamental rupture with the past” (p. 3). For O’Sullivan, “transformative learning is
essentially an integrative process,” but it does not necessarily follow that integration is always transformative (p. 3).

**Systems theory.** In a previous work, I challenged O’Sullivan’s application of general systems theory as an entry point into the individual learner’s world (Bowie, 2011b). O’Sullivan (2002) explained that with “the systems theory viewpoint, in the process of learning the mind organizes itself by virtue of feedback – that is, by monitoring its interactions with its environment” (p.3). The mind continually processes information from the outside as well as from the inside and not only does the mind watch what it is doing, it also adjusts itself: “open systems, like the mind, self-monitor” (p. 3). One is reminded of Camus, as cited by Mezirow (1981) of “a mind that watches itself” as a description of an essential function of adult learning (p. 129). There are two ways the mind and the world continually shape one another, as O’Sullivan (2002) explained: “The first way is homeostatic or negative feedback, a process that brings the world around us in line with our assumptions and goals. The second is adaptive or positive feedback, which leads to change in internal codes and presuppositions” (p. 3). Whenever experiences and assumptions do not match, the cognitive system reorganizes by transforming itself and thereby learning happens. So, in this context: “Transformation means, in essence, the reorganization of the whole system” (p. 4). According to O’Sullivan:

Creativity occurs within a cognitive system when old habitual modes of interpretation become dysfunctional, demanding a shifting of ground or viewpoint. The breakdown, or crisis, motivates the system to self-organize in more inclusive ways of knowing, embracing, and integrating data of which it had been previously unconscious. (p. 4)
To support his system-based theory, O’Sullivan employed the concepts of dissipative structures where a “system transforms itself into a higher order” and autopoiesis – “the creative process of self-organization” (p. 209-10).

Furthermore, Maxwell (2002) compared hectic modern life styles to “dissipative structures” and speculated “that these high-entropy, high-energy input structures are becoming increasingly unstable” and if they remain at their present state, then they will surely “crash and burn” (p. 14). He also expanded O’Sullivan’s project which has moved “beyond the level of critique to take on the more demanding work of envisioning and articulating an ecological, communitarian, and spiritual cosmology in which transformative learning can take place” (p.18). While this new kind of education called integral/developmental mirrors “the creativity of autopoietic dissipative structures” evoking “the dynamic and evolving nature of the processes” for Maxwell (2002), “the function of an integral/developmental education is to move the human cultural ‘dissipative structure’ in an upward course, in which we can become ecologically, personally, cosmologically, and transpersonally reintegrated into the universe from which we arise and in which we are embedded” (p. 18). Recalling his critique of one-dimensional flatland ontology, Ken Wilber argued that systems theory has not relinquished scientific reductionism. Systems theory is adequate at “the material levels which lacks conscious agency and the capacity for dialogue, but cannot adequately address either the Personal level which involves such agency or the Spiritual level” (as cited in Zimmerman, nd, Beyond Flatland Ontology section, para. 1, see also Wilber, 1998, pp. 21-27). Since O’Sullivan’s integral transformative learning draws heavily from systems theory, it is thus rendered incomplete.

**Integral development.** O’Sullivan (2002) has also framed transformative learning dialectically encompassing three integral modes: survive, critique, and create. I have previously
summarized how each mode is related to consciousness (Bowie, 2011b). In the survival mode, humans are independent and above nature where a fragmented consciousness gives rise to patterns of destruction. The critique mode relates to a “profound change in cultural consciousness” that occurred, for example, during the transition from the medieval to the modern world and “the problem of submerged consciousness [as noted by Friere] that a critical resistance education must encounter” (O’Sullivan, 2002, pp. 5-6). Commencing with a planetary consciousness, the creative mode culminates with the expansion of consciousness to the universe itself. However, I disagree with O’Sullivan’s (2002) indictment of current educational ventures that “there is no creativity because there is no viewpoint or consciousness that sees the need for new directions” (p. 10). Perhaps, it is just not the creativity or direction that he wishes to see.

O’Sullivan (1999) linked integral development with “the creative evolutionary processes of the universe, the planet, the earth community, the human community, and the personal world” (p. 208). For O’Sullivan, development involves the “soul of the world” or anima mundi where “consciousness resides both within us and, at the same time all around us” (p. 208). Further, integral “connotes a dynamic evolving tension of elements held together in a dialectic moment of both harmony and disharmony” (p. 209). Here, integral development is seen in the light of the differentiation, subjectivity, and communion dialectic. Moreover, “with the culmination of modernism we are left in the midst of the single greatest transformation of consciousness to take place since the human species emerged” and according to O’Sullivan (1999), “the transformation to time-development consciousness can be considered a mutation moment in the earth-human order” (p. 220-1).

Like other transformative educators such as Dewey and Freire, the naturalistic evolutionary framework of O’Sullivan’s vision could potentially lead to contemporary forms of Social
Darwinism (Bowie, 2011a). For O’Sullivan (1999), integral development is dependent not only on the earth as a single organism, but the universe as a whole: “Our universe, like ourselves, is a time-developmental being” (p 188). Another consequence of this integral thinking is the creation of a global monoculture further diminishing cultural and biological diversity. An interesting debate regarding various problematic Enlightenment assumptions which transformative learning is founded on took place between Bowers (2005) and Lange (2007). They both agreed that transformative learning “perpetuates this ideal of individual sovereignty and the authority of conscience over the traditional/institutional authorities . . . [is] founded on the key Enlightenment assumptions of progress, which privileges change over tradition . . . [and] has often promoted a rationalist way of knowing” (Lange, 2007, Enlightenment Roots section, para. 1-3). Lange (2007) defended her critical transformative learning using a Marxian ontology to show how Friere’s work had been misappropriated and that the difference between a liberal and radical approach is based on a social and evolutionary ontology where individuals overcome all alienating relations by achieving a “differentiated unity” (Gould as cited in Lange, 2007, Marxian Ontology section para. 8). Conversely, Bell and Russell (2000) have considered “how poststructuralism, as it is taken up with critical pedagogy, tends to reinforce rather than subvert deep seated humanist assumptions about humans and nature by taking for granted the ‘borders’ that define nature as the devalued Other” (p. 189). Hence, there is a need to disrupt the modern humanist thinking that still pervades the discourse of transformative education and how it applies to ecological understandings and issues.

Additionally, Bowers (2005) emphasized that “constructionist approaches to learning undermine other forms of knowledge and intergenerational renewal that are essential to resisting the spread of the anomic form of individualism that is dependent on consumerism” (p. 119). In
relation to ecopedagogy leading to a planetary consciousness, Bowers (2005) also claimed that “Gadotti reproduces both the silences and colonizing hubris that can be traced back to Freire’s penchant for interpreting cultural differences as representing different stages in the evolving development of cultures” (p. 119). While anomie is an important theme to consider, it is the problematic theory of recapitulation in relation to development I wish to address next.

Stephen Jay Gould (1977) has argued that the theory of recapitulation (biogenetic law, ontogeny recapitulates phylogeny) “fell only when it became unfashionable in approach (due to the rise of experimental embryology) and finally untenable in theory” (p. 168). Briefly, recapitulation, the brainchild of Haeckel, held that “during its own rapid development . . . an individual repeats the most important changes in form evolved by its ancestors during their long and slow paleontological development” (Haeckel, 1874 as cited in Gould, 1977, p.77). However, Haeckel’s influence lay tragically elsewhere in German national socialism. In terms of individual human development, there has been an “explicit appeal to biological recapitulation: since a human embryo repeats the physical stages of remote ancestors, the child must replay the mental history of more recent forebears” (pp. 135-6). Although Piaget, an educator and trained paleontologist, apparently denied recapitulation, he believed there were parallels between ontogeny and phylogeny. However, in reading Piaget, there seems to be support of the child-as-primitive argument of classic recapitulation:

The fundamental hypothesis of genetic epistemology [Piaget’s name for his school of thought] is that there is a parallelism between the progress made in the logical and rational organization of knowledge and the corresponding formative psychological processes. With this hypothesis, the most fruitful, most obvious field of study would be the reconstituting of human history – the history of human thinking in prehistoric man.
Unfortunately, we are not very well informed in the psychology of primitive man, but there are children all around us, and it is in studying children that we have the best chance of studying the development of logical knowledge, physical knowledge, and so forth. (as cited in Gould, 1977, p. 145)

Regarding education, Gould (1977) noted: “If all the world is in an upward flux along a single path of development, then instruction must follow nature as a child mounts through the stages of lower creatures and primitive civilizations towards a higher humanity” (p. 148). For example, a recapitulation curriculum was implemented in Germany during the nineteenth century based on a cultural-epochs theory which worked well for history but not for science and mathematics. In America, although Dewey had contempt for a rigid and sterile reliance on recapitulation, he nonetheless applied it:

The child is not, educationally speaking, to be lead through the epochs of the past, but is to be led by them to resolve present complex culture into simpler factors, and to understand the forces which have produced the present. (as cited in Gould, 1977, p. 154)

Further, “recapitulation was a major weapon in the liberalization of education” and as Gould (1977) described, “was the bulwark of a naturalistic argument: we must not force children to learn in a pre-set logical pattern: we must, instead mold education to the child by following the course of his natural development” (p. 154).

At this point, it is worth mentioning that it was von Baer’s critique of recapitulation on which Spencer based his *Synthetic Philosophy*, a universal system integrating the organic and inorganic: “the progressive differentiation of complexity from an initially poorly-bounded homogeneity, just as the chick develops from a uniform egg” (p 113). True to his *Naturphilosophie* roots von Baer wrote “there is one fundamental thought that permeates all the
forms and stages of animal development and governs all their relationships. It is the same thought that, in the cosmos, collects the separated masses into spheres and binds these together into a solar system” (as cited in Gould, 1977, p. 114). From this, it is apparent that O’Sullivan along with Berry and Swimme and other transformationists have resurrected the romantic Naturphilosophen ideology of “an uncompromising developmentalism and a belief in the unity of nature” where “all previous dualisms are dissolved into a ‘biocentric universalism’” and synthesized it with recapitulation (pp. 35-6). O’Sullivan’s (1999) planetary context of creativity also suggested a naturalized universal curriculum: “that the universe story can help to guide and direct our educational vision” and “enable us to interact more creatively with the emergent processes of the universe” (p. 195). In fact, O’Sullivan referred to “a type of biological remembering within our mother’s womb that reminds us that we have worn vestigial gills and tails and fins for hands” (p. 222). O’Sullivan’s application of Berry’s evolutionary cultural-epochs courses is like building “pedagogical mountains out of biological molehills” (Starch, 1927, as cited in Gould, 1977, p. 153).

**Spirituality – a sense of sacred.** In an earlier work, I have shown how O’Sullivan added a spiritual dimension through the notion of communion as sacred relationship contrasted with the alienation of individualism (Bowie, 2011a). Although there is a cosmological aspect to spirituality, various religions identify with, above all, an intimate relationship between an individual and the creator and not with the cosmos, as O’Sullivan (1999) inferred. Since a primary relationship between the cosmos and the person cannot be universally sustained, his argument “that personal development is integrally related to planetary development” is weakened and suffers the same fate as the closely resembling discredited theory of ontogeny recapitulates phylogeny (p. 191).
In relation to the sense of the sacred, O’Sullivan (2002) stressed that “transformative education must address the topic of spirituality” and “that educators must take on the development of the spirit” (p. 10). While O’Sullivan has held that institutional religion and the market have compromised spirituality, I would add that Christianity has been seriously compromised by science and new age ideals. If, as O’Sullivan suggested, “our first and foremost task in life is to take hold of our spiritual destiny,” then it follows that “we must begin to consider education as a spiritual venture” and that it encompasses all aspects of transformative learning (p. 10). While spirituality, for O’Sullivan (1999), is subject to the same time-developmental context as the universe, I find his vision inadequate. For instance, he wrote:

We are in need of a spirituality which has embedded within it a biocentric vision that keeps us vitally connected to the natural world and to the unfolding of the universe. We need an enchanted spirituality that awakens us to the awesome quality of our experience within this grand mystery that we have been born into. (p. 264)

Today we are witnessing myriad forms of materialist spirituality informed by science and ecology that connect us to the earth and the greater universe such as *The Universe Story* by Swimme and Berry (1992) and *The Dream of the Earth* by Thomas Berry (1988). Proponents of deep ecology and eco-psychology have also written of the “interiority (subjectivity) of all things” and the oneness of humans and nature while ecofeminists have blazed many new spiritual paths (O’Sullivan, 1999, p. 265-6). Professor Jorge Canesse-Sevilla (2008) has traced some of the antecedents of deep ecology and eco-psychology to Schelling’s *Naturphilosophie*. In fact, “*Naturphilosophie* is the claim that both nature and ‘spirit’ (the self, self-consciousness, and consciousness) are identical agencies” (np). While O’Sullivan incorporates all of these different
streams into his work, this spiritualized evolutionary ecological framework caters more to those with new age ideals.

Furthermore, O’Sullivan (1999) posited the notion of an ecological self – a transpersonal level of consciousness where “we are all one . . . a unity of being where self is world and the world is self” (p.226). At this point, I wonder whether Rifkin’s (2011) extended ecological self and biosphere consciousness leading to a Third Industrial Revolution and O’Sullivan’s ecological consciousness leading to an *Ecozoic* age can be referring to the same process and if so: How can the same process lead to disparate events? Developing this ecological self in the education for a planetary consciousness from a so-called spiritual perspective is also a challenge to the postmodern encapsulated minimal self. I question how the ecological self compares with Clark and Dirkx’s (2002) work on a postmodern “nonunitary self” and the notion of multiplicity that is derived from our “multiple positionings” (p. 109). Accordingly, it is here that “feminist and poststructural theorizing of the subject becomes useful to investigate” (Rasmussen, 2011).

**Postmodern Critique of Critique**

In response to the claim that the Judea-Christian tradition is to blame for the ecological crises, Tirosh-Samuelson (2005) has challenged earth-based spirituality and that nature can be seen as the basis for an ecological ethic (p. 373). From a Jewish perspective, “nature was never understood apart from God, the creator of nature, and was never venerated for its own sake. Instead, nature manifests God’s power and wisdom so that an awareness of nature commands reverence to God” (p. 374). While neither pantheism (God is nature) nor panentheism (God is in nature), I believe this perspective refers to God with us – Immanuel – and simply means that although distinct, God and nature coexist as creator and creation (Isaiah 7:14, Mat 1:23). For
Tirosh-Samuelson (2005), “a nature-based feminist spirituality that is inspired by Deep Ecology is Jewishly problematic” (p. 376). Specifically, she found “Deep Ecology’s critique of ethics of stewardship as ‘shallow ecology’ to be not only unjustified but also based on a questionable conception of self” (p. 391). In addition to the covenantal relationship with its corresponding principles such as the distinction between the sacred and the profane, Tirosh-Samuelson (2005) invoked the ecological virtues of “humility, modesty, and moderation” through “self-control” which could serve as part of a Jewish environmental ethics and a theology that is ecologically sensitive (p. 382). Reflecting a postmodern sensibility, she also highlighted Karen Warren’s ecofeminist ethical characteristics: “contextualist, pluralistic, inclusive, rooted in lived experience, not value-neutral, not based on abstract individualism, relational, and concerned with care and love” (p. 388). In this light, it is worth seeking how both Jewish and Christian faiths can add to the conversation concerning ecological values.

Finally, I would like to address O’Sullivan’s overall vision of transformative learning together with Berry’s dream-vision which resonates more with an indigenous vision quest than with a biblical prophetic vision or dream. As expressed elsewhere (Bowie 2011a), Donna Haraway’s poststructural critique of science can be helpful in this case. In contrast to Haraway’s position “that difference rather than commonality of a universal is the operant critical analytic lens for viewing society,” O’Sullivan (1999) posited that “difference must ultimately be understood in an integral manner” (pp.181-2). However, this response is not helpful. Specifically, O’Sullivan uses Berry’s notion of the “universe as a text without a context,” but it is not even possible to dispute something that has been totally decontextualized (p.183). Adopting Swimme and Berry’s *Universe Story*, O’Sullivan’s integral vision is contrary to Haraway’s perspective. For O’Sullivan, with the form of the human eye, “we have the elementary particles that stabilized in
the fireball . . . the elemental creations of the supernova . . . the molecular architecture of the early organisms” (p. 188). Whereas for Haraway (1988), disembodied eyes “distance the knowing subject from everybody and everything in the interests of unfettered power” (p. 581).

Vision in this technological feast becomes unregulated gluttony; all seems not just mythically about the god trick of seeing everything from nowhere, but to have put the myth into ordinary practice. (p. 581, emphasis added)

As an alternative, she wrote of “situated knowledges” – a view from somewhere – a vision of “location, embodiment, and partial perspective” (p. 581, 584). For O’Sullivan (1999), Haraway’s “type of critique exposes us to the inherent ethical dangers that are potential in any new large vision,” (p. 181-2). For example, Marshall (2002) identified “ecological fascism (that the unity of nature is anti-individualistic and intolerant of dissent and difference in non-human ecological settings)” as a potential threat (pp. 25-6). Haraway's notion of situated knowledge is an important addition to this discourse which could breathe new life into critical pedagogy, but that would require letting go of Habermasian universality and rationality which due to its current embeddedness is highly unlikely. In a practical sense, “understanding and employing this concept of situated knowledge challenges Freirian critical pedagogy and more closely aligns with Ellsworth's (1989) approach to teaching and learning” (Rasmussen, 2011).

Might we also consider situated knowledge and a situated self within ecological and educational debates? It seems that the great cosmological drama is between those who look to a pre-given reality to guide them and those who adhere to a social construction of reality to inform them. From the perspective of a poststructural political ecology, Escobar (1996) placed the discourses of biodiversity and sustainable development in the broader context of what Donna Haraway (1991) called “the reinvention of nature”, which “began with the languages of systems
analysis” and “marks the final disappearance of our organic notions of nature” (as cited in Escobar, 1996, p. 59). I question how this compares with Berry’s (1999) description: “The historical mission of our times is to reinvent the human – at the species level, with critical reflection, within the community of life-systems, in a time-developmental context, by means of story and shared dream experience” (p. 159). Recall Haraway’s phrase: “Nature cannot pre-exist its construction” (as cited in Braun, 2002, p. 16). While the social construction of reality might work for education, nature and discourse, I am not convinced that the same holds for the revealed knowledge of the Christian faith.

**Toward a Postcolonial Coexistence**

Following this critique of O’Sullivan’s integral transformative learning and “how we learn to negotiate and act on our own purposes, values, feelings, and meanings rather than those we have uncritically assimilated from others” (Mezirow, 2000, p. 8), I now present a postmodernism of resistance based on two alternative approaches: a postmodern ecology of association and a postcolonial model of coexistence. Briton (1996) described that other postmodernisms of resistance which reject analytic and dialectic reason are unlike critical postmodernisms that retain dialectical thinking. For example, he cited Jennifer Gore, an advocate of postmodernisms of resistance, who was “troubled by critical postmodernism because its proponents tend to favor the abstract rationale and oftentimes obtuse discourse of critical social theory” that “holds little emancipatory promise” (p. 95). Briton also referenced Ellsworth (1989) who found that conditions became worse because “[critical] pedagogies fail to problematize the very real issues that surround the notion of ‘voice’” (p. 97). Briton (1996) concluded that “critical postmodernism inadvertently reproduces the material conditions that give rise to the
ideas it struggles to overcome, further entrenching oppressive social forms, rather than dissolving them” (p. 97). While Briton’s work is helpful in exposing modernity’s inadequacies and his postmodern pedagogy of engagement is hopeful, my point of departure is with dialectical reasoning and the realization of the emancipatory goals of the Enlightenment.

As evidenced above, throughout the work of Berry, Swimme and O’Sullivan there is an underlying synthesis of Western science and traditional ecological knowledge (TEK). However, their attempt to integrate science and spirituality in a unified new story and integral transformative education is problematic. Expanding my preliminary inquiry (Bowie, 2010), Aikenhead’s (2006) *Rekindling Traditions* research project has offered an alternative approach. While Canadian science educators “stand between two diverse knowledge systems: Western and Aboriginal ways of describing and explaining nature,” at the same time “cognitive imperialism pervades school science whenever students, particularly Aboriginal students, are assimilated (some would say colonized) into thinking like Western scientists in their science classes” (p. 223). Further, “the Aboriginal academy has argued that colonization under the guise of ‘science for all’ undermines students’ self-identities as Aboriginal people” (p. 223). Rather than enculturating students into western science, adult educators “can adopt a decolonizing approach to science teaching by enculturating students into the students’ community” (p. 224). This decolonizing approach is compatible, as Aikenhead related, “with the postcolonial notion of Third Space, where Western-scientific knowledge resides side by side with Aboriginal science without either science eliding the cultural or political authority of the other, or ‘normalizing’ the differential structures in conflict” (p. 224).

Traditional ecological knowledge (TEK) is one approach that has been conceived to bridge the two distinct knowledge systems of Western and Aboriginal science. On one hand, in the hope
of mitigating human impact on the environment, scientists have extended the boundaries of science by enquiring into the traditional knowledge and wisdom of indigenous elders. On the other hand, TEK focuses on the “web of relationships between humans, animals, plants, natural forces, spirits and landforms in a particular locality, as opposed to the discovery of universal ‘laws’” (Battise and Henderson as cited in Aikenhead, 2006, p. 225). Nonetheless, Aikenhead (2006) cited McGregor’s (2000) critique of TEK as practiced in Canada which revealed inherent power relationships and a non-Aboriginal agenda “which perpetuates the same pattern of ‘discovery’ and investigation that has characterized colonial history in North America. TEK, therefore, is symptomatic of the relationship that Aboriginal people have with their colonizers” (p. 225). Since the concept of TEK originated with Western academics outside the Aboriginal community, according to Aikenhead (2006), “TEK tends to be pervasively imbued with a Western perspective” (p. 225).

In addition to a foundational respect for local knowledge and outdoor education which emphasizes a sense of place, Aikenhead (2006) noted that “future science teaching will need to become postcolonial and cross-cultural in nature (i.e., helping students move from their everyday culture into the culture of Western science – cultural border crossing)” and that teachers will need to be “cultural brokers who could smooth students’ cultural border crossings into school science” (p. 226). Due to the great diversity in cultures from community to community, subject matter must match the meaningful cultural context of the local community. Thus, a cross-cultural curriculum must not only convey the local Aboriginal values and view of nature but also “Western science as another way of understanding nature – a way that expresses a Western-scientific world view and a Western set of values about nature” (p. 227).
Aikenhead (2006) has called learning about another culture “anthropological instruction,” and when dealing “with spirituality in Aboriginal science, students were expected to understand it, not necessarily to believe it. This distinction was most important to parents who lived a fundamentalist Christian faith” (p. 234). Further, “autonomous acculturation” is an alternative to assimilation or enculturation and “as the value structure of Western science became more apparent to Aboriginal students (e.g., the mathematical idealization of the physical world), students became freer to appropriate Western knowledge without embracing Western ways of valuing nature” (p. 235). In this case, “the integration of Aboriginal science and Western science, according to McGregor’s coexistence model (2000) was another culturally sensitive instructional strategy that proved successful” (p. 234).

Given the presence of systemic and hegemonic power relationships, rather than attempting to bridge or integrate Western and Aboriginal sciences as TEK does (and as Berry, Swimme and O’Sullivan do), I adopt McGregor’s (2000) postcolonial model of coexistence which “promotes functioning of both systems side by side . . . [and] encourages equality, mutual respect, support, and cooperation” (as cited in Aikenhead, 2006, p. 226). Although originally designed for Aboriginal and Western science curriculum which are epistemologically and ontologically different, Aikenhead (2006) suggested that this model could be transferred to other contexts including science education for Euro-Canadian and Anglo-American students (p. 223).

**Postmodern Ecology and Traditional Christianity**

Despite potential inconsistencies, a postmodern ecology of association and traditional biblical Christianity can also be integrated according to a variation of McGregor’s postcolonial model of coexistence rather than a holistic integral approach. However, this variation eschews the notion
of “hybridity as the Third Space where heterogeneous lifestyles and practices coexist with homogenizing scenarios of everyday life both at the centre and at the margin” (Bhabha as cited in Kanu, 2006, p. 214). As previously mentioned a postmodern ecology of association avoids the trappings of holism, organicism, equilibrium and materialistic unity and does not rely on systems, hierarchies and progressive evolution found in many postmodern sciences. While ecology has always been, in effect, postmodern, it does, however, rely predominately on rationality and is in need of a spiritual dimension. Since they share the same Western worldview, I suggest that traditional biblical Christianity is compatible with postmodern ecology, and that they provide a postmodernism of resistance to counter the modern universal narratives of Berry, Swimme and O’Sullivan.

In their post-foundational approach to rationality, Clark and Wilson (1991) proposed employing Bernstein’s understanding of “practical reasoning [phronesis or practical wisdom]” in place of Mezirow’s ideal conditions of discourse (p.151). Adding to this, I propose that a biblical understanding of spiritual wisdom (sophia) is more inclusive from a Christian perspective. From Romans 8:6 which refers to being spiritually minded (pneuma phronema), it is implicit there is a difference between spiritual and psychic. For, it is also written:

Even so no one knows the things of God except the Spirit of God. Now we have received, not the spirit of this world [cosmos], but the Spirit who is from God, that we might know the things that have been freely given to us by God. These things we also speak, not in words which man’s wisdom teaches but which the Holy Spirit teaches, comparing spiritual things with spiritual [pneumatikos]. But the natural [psuchikos] man does not receive the things of the Spirit of God, for they are foolishness to him; nor can he know them, because they are spiritually discerned. (1Cor 2:11-14)
Likewise, in contrast to Mezirow’s critical reflectivity: “Discernment gradually leads people to wholeness, to meaning, to a tacit knowledge of the mystery held within their own beings” which, as Boyd and Meyers (1988) related, “can be shown or witnessed or revealed, but cannot be fully explained” (pp. 275-6). Again, to extend this, I propose a spiritual discernment or “discerning of spirits” which is a gift of the Holy Spirit (1Cor 12:10).

In the Christian church, first, there is to be a unity of the Spirit, a fellowship, where each individual is connected to the head of the body, Jesus Christ, and then make and sustain connections with the local community and environment. In the letter to the Ephesians, the apostle Paul exhorted “to keep the unity of the Spirit in the bond of peace” (Eph 4:3), and again, “till we all come to the unity of the faith” (Eph 4:13), for believers are to “walk by faith, not by sight” (2Cor 5:7). From a Christian perspective, transformation entails not only meta-noia – repentance but also meta-morphosis – an inward change of the nature of the mind, so transformation is not only a change in consciousness, but also a transformed heart. For the heart knows what the mind cannot comprehend, or in the words of seventeenth-century mathematician and philosopher, Blaise Pascal (2010): “The heart has its reasons, which reason does not know” (Pensee 277).

Apart from materialism, behind feelings and emotions and beyond reason, faith, the quintessence of non-rationality, is required to counteract the apotheosis of reason, for without faith it is impossible to please God (Hebrews 11:6). Otherwise, a change in consciousness without a renewed mind is like putting new wine in old bottles. Instead of communion which connotes the special fellowship between believers and God, I suggest that coexistence is a more appropriate way to describe the integration of a postmodern ecology and traditional biblical Christianity.

O’Sullivan, Swimme and Berry identify with a certain kind of nature-based spirituality of mind and matter, but it is not the spirituality of the Bible. They present a process of
transformative learning that signifies a psychic change in contrast to a deeper spiritual change. Similar to “primitivism” of the eighteenth century, their primordial eco-spirituality serves as “propaganda for a new order,” and like the Enlightenment’s ideals leads “to the veiling of power in a new language” (Briton, 1996, pp. 63-65). Recalling Berry’s quote at the beginning of this section, this proposed postcolonial model of coexistence challenges ecology as the overarching context for all disciplines including education. Although containing some important lessons, I contend that O’Sullivan’s vision of an integral transformative education, based on Berry and Swimme’s *Universe Story*, is “a carrier of the most problematic values and concepts that imperil the future of human society and planetary life” (Lange, 2011, p. 1).

**Conclusion**

Yes, we must learn to be more responsible citizens and take better care of our immediate surroundings. Adult education is desperately in need of ecological literacy, not an ecological education that promotes an ecological consciousness for a new social order. We are living in an age of uncertainty and adult education must offer not only hope for a better future but also prepare for uncertain calamity. As already mentioned, a postmodern ecology focuses on local environmental degradation such as habitat loss, species extinction, and pollution, rather than one immanent global catastrophe. It also allows for realistic measures to mitigate harmful activities and rehabilitate small areas of degraded land where real change can occur. The recent dilemma regarding global climate change is an exemplar of the difficulties and colossal effort required to turn the crisis around. An integrated transformative education also urgently needs to embrace spirituality and allow adults, if so inclined, to seek God for wisdom and understanding in these uncertain times.
While I am encouraged that spirituality has become an important feature of transformative learning in these postmodern times, I am concerned that these various spiritualities are not congruent with the teachings of the Bible. Neither do I want to see Christianity compromise its revealed truth to accommodate a universal spirituality which has reoccurred in one form or another throughout history (i.e. Gnosticism, Mysticism). Thus, I propose a postmodernism of resistance guided by biblical Christian principles that counters the totalizing universal vision of Berry and Swimme’s *Universe Story* and O’Sullivan’s related integral transformative learning along with various Postmodern Sciences and New Age ideologies that promote a materialistic unity. This alternative postmodernism of resistance is situated with a non-hybrid postcolonial model of coexistence following McGregor and a postmodern ecology of association that was originally articulated by Gleason and revived by Marshall as outlined in the first section.

While not an exhaustive account of the integration of ecology, Christianity and transformative education, this conceptualization allows for the separate coexistence of culturally distinct ways of knowing without any one of them usurping the authority of the other or normalizing their differences. Further research will shed more light on what would hinder such a postcolonial model of coexistence. Likewise, a postmodern ecology of individualistic association challenges a universal evolutionary cosmology based on materialistic unity, holism, organicism and self-organization. I will let the apostle Paul have the last words:

> For we know in part, and we prophesy in part.  
> But when that which is perfect has come, then that which is in part will be done away.

1Co 13:9-10
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