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FIVE PRINCIPLES OF INTEGRAL ECOLOGY

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A LOOMING MASS EXTINCTION of species the likes of which has not been seen in 65 million years, global climate change, habitat loss, diminishing supplies of fresh water and topsoil, disappearing forests, polluted and overfished oceans, increasing desertification: all are the result of human choices and destructive ways of life. The sciences of ecology, which study the relations of organisms to their environments, clearly have an essential role to play in understanding and attempting to ameliorate the mounting crises we face. The gravity and complexity of these crises, however, call for integral approaches to the theory and practice of ecology. The word *integral* here suggests, to begin with, that ecology is relevant to the full range of human knowledge and action. All human endeavor—from food production and resource use to economics, politics, and education—needs to be ecologized, in the sense that implications for the fate of the entire Earth community need to be considered. Conversely, ecology needs to draw from the whole spectrum of human inquiry, not only from the natural sciences, but from the human and social sciences, from the world's spiritual traditions (Eastern, Western, and indigenous), and from collective wisdom and individual insights.

While the sciences of ecology have already contributed to a more holistic, and in this sense, more integral understanding of the natural world and of the relation of organisms (including human beings) to their environments, the general trend has been toward ever-increasing specialization, disciplinary fragmentation, and an exclusive focus on material interactions and external relations. Outside scientific ecology proper, this trend has been somewhat compensated for with

the emergence of a growing number of hybrid approaches, including political ecology, social (and socialist) ecology, deep ecology, feminist ecology, spiritual ecology, and most recently Sean Esbjörn-Hargens and Michael Zimmerman's (2009) impressive proposal for an "AQAL" ("all quadrants, all levels") system of integral ecology, based on the work of integral theorist Ken Wilber. This Wilberian system (a detailed presentation of which appears in the third chapter of this book) involves a conceptual mandala that superimposes four quadrants (interior/exterior and individual/collective) on the traditional three levels of body, mind, and spirit. Its notable virtues include an easily mastered map of the multiple terrains of ecological theory and practice; an explicit recognition of the importance of interiority (for all organisms, not just human beings); a coherent articulation of ecological or environmental ethics; and a robust view of the nature of evolution and human development, including its spiritual dimensions.

Alongside these and doubtless other virtues, however, certain aspects of the AQAL system could meet resistance among those otherwise sympathetic to the idea of an integral ecology. Some representatives from the various schools of ecology might not recognize themselves as they are characterized, and categorized, within the system, mostly confined as they are to a single quadrant (and sometimes to a subquadrant) and level. A danger here, for both categorizer and categorized—and this despite the real care taken by Esbjörn-Hargens and Zimmerman (2009) to honor the perspectives they attempt to integrate—lies in mistaking the map for the territory, a danger amplified when the map purports to cover everything conceivable and in sight, including the ground one is standing on. Personally, I have found the AQAL map fascinating to contemplate and useful as an orienting device. I would not, however, wish to see the project of integral ecology (or more generally integral theory) collapsed into the AQAL, or any other, system (again, it is a credit to Esbjörn-Hargens that, despite his obvious commitment to the AQAL approach, he is a major advocate for healthy and vigorous dialogue among all varieties of integrality). After all, we know the importance of biodiversity for the overall health of ecosystems. The same should hold true for the field of integral ecology, or better, as we have indicated with the title of this volume, integral ecologie*s*.

Instead of another system, therefore, I want to propose a set of five principles that together can allow for a kind of thinking that will be sufficiently vital and supple to match the complexity of the terrains being explored. In this case, the terrains include not only the relations of humans and other organisms to their environments, but the theories used to understand these relations. While

these principles apply to integral theory in general, they are especially relevant to any approach to ecology that would consider itself integral.

Before turning to the principles, however, a few brief comments about the history of integral thought might be helpful. The first explicit and fully developed use of the term *integral* for our purposes is to be found in the voluminous writings of the 20th-century Indian sage and spiritual teacher, Sri Aurobindo (see especially Aurobindo, 2010). His philosophy and yoga of integral nondualism constitute a monumental synthesis of Hindu and Western traditions (though the latter are rarely explicitly acknowledged). The nondualism in question refers to the true nature of things, where matter and spirit, the individual and the universal, the finite and the infinite, time and eternity, and a whole series of other pairs of terms are seen to be manifestations of the more inclusive reality of the Whole or Absolute. This Absolute, however—and this in contrast to monistic nondualism (whether of the idealist or the materialist type)—maintains the reality of the differentiated pairs. Though clearly influenced by the Hegelian concept of the Absolute and its associated dialectical logic, Aurobindo puts a greater stress on the idea of evolution, explicitly recognizes the existence of subtle worlds, and sets a higher value on trans-rational, or *supramental* modes of knowing.

From Aurobindo, the word *integral* was taken up by Jean Gebser (1985), whose dense but highly original and visionary book, *The Ever-Present Origin*, presents a view of different fundamental structures of consciousness (archaic, magical, mythic, mental, and integral) and evidence for the transition underway from the mental and perspectival to the integral-aperspectival. By *perspectival* Gebser refers to a late phase of the mental structure and its associated worldview, which, signaled by the invention of linear perspective during the Renaissance, made possible the emergence of modern science, politics, and industry. The power of perspectival thinking is that it allows for a detailed mapping of systems, especially with respect to the prediction and control of certain (ideally quantifiable) properties of the systems in question. As the Romantics, Idealist philosophers (such as Schelling and Hegel), and many others since have argued, however, this kind of thinking, if not checked, is antithetical to the character of living beings, whose nature is irreducibly qualitative and withers when confined to the perspectival space of Cartesian grids. The integral character of nature and life, and therefore the possibility of an integral ecology, calls for the critical integration of perspectival thinking into a way of knowing and being that is more true to what is (or becomes), is better for realizing what ought to be, and is more beautiful to behold.

Hegel, Aurobindo, and Gebser each contributed central elements to Wilber's version of integral theory, though many other—and in principle all other—figures

and theories find a place in the AQAL map. Based as it is on this map, Esbjörn-Hargens and Zimmerman's (2009) proposal for an integral ecology succeeds in integrating hundreds of distinct schools of ecology. To my mind, however, because the quadrants in particular can lend themselves to a kind of residual perspectivalism (where there is a place for everything—and everything, though not always happily so, is in its place), it is, as already noted, important to cultivate alternative approaches to integral ecology. My own approach, while both friendly to, and in dialogue with, that of Esbjörn-Hargens and Zimmerman, lays a greater emphasis on principles than on a system or map. In what follows, I consider five such principles in the form of five adjectives: *evolutionary*, *planetary*, *transdisciplinary*, *(re)enchanted*, and *engaged*. Others doubtless could be proposed, but these five seem to me necessary for any approach to ecology, including one based on the AQAL map, that would consider itself integral. As we shall see, each of these principles in one way or another implies the others, and it is only after all five have been considered that a more adequate (though still provisional) understanding of each of them can be achieved.

EVOLUTIONARY

The first principle invites us to enact ecological inquiry within a more integral understanding of time. To begin with, and in contrast to the ordinary, purely quantitative conception of time, such an understanding involves the recognition that we now stand at a singular and in many ways unparalleled moment. This moment can be characterized by two Greek words—*eschaton* (literally, the last or end time) and *kairos* (the right or opportune moment).

We are currently in the early though quickly accelerating phase of the sixth mass extinction of species, and in the process bringing to an end the 65-million-year geological period called the Cenozoic.[1] The Cenozoic began with the last mass extinction event, which claimed about 75 percent of the world's species, including the nonavian dinosaurs, and which was probably caused by a massive meteorite impact on the Yucatan peninsula. The new geological period that followed saw the rise of birds and mammals, including the relatively recent appearance of our first hominid ancestors perhaps some six or seven million years ago. The current mass extinction could be happening at a much faster rate than the previous one, and this time it is not a giant meteorite, but our own species that is bringing it about. Some might take comfort in the idea that the last mass extinction seems to have made way for the greatest spurt of biodiversity the

planet has seen and for the eventual emergence of our own species. However, apart from the fact that we have no reason to believe in the possible repetition, from our point of view, of such a positive outcome, the grim reality is that life as we have always known it is on the brink of collapse. This is the most momentous eschaton, the end of the longest arc at whose uncertain threshold we now stand.

We stand at another end, that of the Holocene, the last subphase of the Cenozoic, which began with the lifting of the most recent glacial period about 12,000 years ago. The Holocene has been marked by a relatively stable climate within ranges that favored the rise of human civilization. As we know, this stability is now threatened by global climate change, itself the newest critical factor (alongside habitat loss, attrition or decimation of populations, and environmental pollution) contributing to the current mass extinction. There are other ends as well, including that of the historical period as a whole (around 5,000 years), the modern period (500 years), and that of cheap oil (100 years), each of which might be seen as increasingly focused perspectives on the complex processes that are bringing about the end of the Holocene and the Cenozoic.

If we are living in an end time, however, it is also a time of *kairos*, "the right moment" as Jung (2006) put it, "for 'a metamorphosis of the gods,' of the fundamental principles and symbols" (p. 110) that have brought us to this end. We are at a critical point of transition between the still dominant secular-scientific worldview and a more integral worldview struggling to take hold. Though, in its origins, the modern worldview was inspired by Hermetic philosophy, alchemy, and other mystically oriented religious and theological impulses (see Kelly, 2010, 49ff.), since the nineteenth century it has devolved into the spiritually deadening, mechanistic and materialistic view of reality that much of contemporary culture now takes for granted. From the perspective of mainstream science, the cosmos is seen as composed of essentially lifeless particles, which, without inherent meaning or purpose, have more or less accidentally given rise to life and to self-conscious beings such as ourselves.

There have been exceptions to the mainstream, of course, including the great Romantic and Idealist philosophers (especially Schelling and Hegel) and lone visionaries such as Aurobindo, Rudolph Steiner, Jung, Teilhard de Chardin, and Ken Wilber in our own times. A notable contemporary exception to the mainstream is represented by the work of evolutionary cosmologist Brian Swimme. Along with his mentor and colleague, Thomas Berry—both of whom were inspired by the work of Teilhard de Chardin—Swimme has devoted his life to articulating the New Story or Journey of the Universe (see especially Swimme, 1992, 1999, and Swimme and Tucker, 2011). In contrast to the dominant evolutionary

narrative, Swimme sees the cosmos as engaged in the process of actualizing its intrinsically spiritual potentials. From the numinous Big Bang or *primal flaring forth*, as he prefers to call it, to the eventual appearance of self-conscious life, finally able to recount the grand epic of its own emergence, Swimme challenges belief in the despotic reign of mere chance and necessity, the jealous twin gods of mainstream science and standard evolutionary cosmology. While honoring and joyfully celebrating the continuing revelations of the modern scientific project, he recasts them in a more integral context. His telling of the New Story liberates the cosmological imagination from the mechanistic straitjacket to which it has been confined. Swimme invites us to experience our participation in an evolutionary dance that manifests such cosmological powers as *seamlessness*, *allurement*, *transmutation*, *transformation*, *interrelatedness*, and *radiance*.

"This is the greatest discovery of the scientific enterprise," Swimme (2006) has said: "You take hydrogen gas, and you leave it alone, and it turns into rosebushes, giraffes, and humans" (para. 14). Along with transmutation (the power to change the self) and transformation (the power to change the whole), the evolution of the cosmos from hydrogen gas to humans involves the power of *emergence* (creativity and self-transcendence). Unlike most of Swimme's other powers of the universe, the idea and problem of emergence has come to the forefront of more mainstream considerations of evolution. It is a problem because, from within the dominant mechanistic paradigm, all properties of a given system must be explained in terms of—which is to say, reduced to—the properties of its simpler constituent elements. This is problematic since, as Swimme's words above imply, there are at least two miraculous leaps from hydrogen gas to humans: the first from matter to life, and the second from life to mind (or self-conscious life). Of course the problem disappears if one is content to regard life as "nothing but" a manifestation of specialized chemical interactions, and mind or self-consciousness as a mere byproduct of organic chemistry. The technical philosophical term for this way of thinking is *epiphenomenalism*, the essence of which was nicely summed up more than two centuries ago by the French Enlightenment philosopher Cabanis, who pronounced: "The brain secretes thoughts as the liver secretes bile."

For those not satisfied with the dogma of epiphenomenalism, it sooner or later becomes necessary to conceive that, in ways we will probably never fully understand, what emerges is somehow already present as an initially hidden potential. Life and consciousness themselves, in other words, are powers of the universe. The very word *emergence* suggests as much, as does Cabanis's "secrete," for only that which is already present, though invisible, can come out (emerge)

or be pushed out (secrete). This is the view taken by Aurobindo (2009) (and by the esotericists in general), for whom evolutionary emergence is unintelligible without a metaphysically prior *in*volution. Here the simplest forms, such as hydrogen gas or elementary particles, are seen as among the last of a series of successive self-limitations on the part of the Absolute or the Whole.

The metaphysical notion of involution presents its own challenges, however. Apart from turning the dominant habit of reductionistic thinking on its head, there is the necessity of conceiving of processes or stages outside of time as we know it (since the time of science is the time of the evolving universe) and of granting the existence of other, subtle realms beside the one of physical matter/energy, the only one that science has so far chosen to recognize. I will not pursue these challenges here. Instead, I want to conclude this section on the evolutionary principle with a brief consideration of a third Greek word: *telos*, which, like eschaton, also means "end" in the sense of "goal" or "purpose" (*eschaton*, by contrast, suggests "end" as "edge" or "limit").

In dialogue with me a few years back, as a kind of gloss on the miraculous potentials of hydrogen gas, Swimme remarked:

> I would say that the most significant discovery in the last 30 years of science is the telos of the universe. And this is something that we worked hard, very hard to convince ourselves did not exist in science. . . That is why it is so incredible that we are coming to this: the realization that the universe has been *rushing to life*. Before, it was that life *happens*, and it was either accidental or beside the point. Now the idea is that the universe has been rushing to life. It is a very, very different conception (Kelly & Swimme, 2006).

It is of the very nature of matter, in other words, to manifest as life. No sooner had the young Earth, in all appearances a mere ball of molten rock, cooled just enough to allow for the formation of liquid water, than the first living beings emerged. If the telos of our rock-planet was life, however, the story would have stopped with single-celled organisms. It is true that, after the initial emergence of life on Earth, it took more than three billion years for complex organisms to emerge, but when the conditions were right, emerge they did. In the only instance of life with which we have any direct acquaintance, moreover, it is also the case that life has evolved to mind, which seems to be its telos.[2]

I had a visceral experience of the emergence of life from matter and mind from life as I walked with Stephan Harding and our students one summer in

England along the Devon coast. In 4.6 kilometers, or 4,600 meters—which is about twice as many steps—we retraced the 4.6 billion years of Earth's history, from the ball of molten rock to our own end times. With each step, we traveled half a million years. For the better part of an hour, or around 700 million years, nothing but slowly cooling molten rock. Then suddenly, matter unfolds into life with the first cells. It was as if, until this moment, Earth had been in a state of deep, trance-like sleep, and with the first life, it began to dream.

We walked this early dreaming for another hour and a half, around sixth thousand paces, equal to three billion years, before the first multicellular organisms appeared. Another billion years pass and, finally, the pace of life accelerates dramatically with the Cambrian explosion of new, more complex life forms. Eight hundred paces, or 400,000 years further along, the first rodentlike mammals walk alongside the dinosaurs. Two hundred or so paces later, we pause to mark the asteroid impact that triggered the last mass extinction 65 million years ago.

Another hundred or so paces and we are approaching the city of Dartmouth, the end of our Gaia walk. Miraculously, after the last mass extinction, we enter the age of mammals, of birds and butterflies and grasses and finally, less than 10 paces from the end of our journey, our first hominid ancestors. Before we take the last couple of steps, Stephan takes out his measuring tape for the final half-meter, or five hundred thousand years, during which our own species, *Homo sapiens sapiens*, makes its very late appearance We all crouch beside him, with a sense that the long dream of Earth has passed into a kind of fitful waking. Focusing our gaze on the yellow measuring tape at our feet, we try to take in the idea that the whole of human history is contained within the last five millimeters, or about one quarter of an inch. We would need a magnifying glass to see the last half of a millimeter that saw the birth of the modern period and with it, the Planetary era (of which I shall have more to say in the next section), let alone the merest fraction of this last half-millimeter, the last 50 or so years, which have brought us to the threshold of this eschaton.

An experience that some people have at this point is that of the apparent insignificance of the human, whose historical presence barely registers as the tip of a toe-print on the last of almost ten thousand paces. Surely, however, this is an illusion of perspective. More particularly, it is an illusion of hyper-perspectival, or what Gebser (1985) also calls *deficient-mental*, consciousness. This kind of consciousness arose after the modern scientific revolution and is typical of the dominant mechanistic paradigm. Its sense of time is strictly linear and quantitative. From within this paradigm, as we have seen, the cosmos is seen as essentially without purpose, its evolution a mere catalog of material events,

"a tale told by an idiot, . . . signifying nothing" (*Macbeth*, V). Imagine for a moment, however, that some alien civilization millions of light years away had sent a signal our way. Would the day it was received be any the less significant for the silent stellar distances the signal had traveled? In this case, the sender is Earth itself, and we, the receivers, are also Earth.

The merely quantitative judgment of insignificance is also belied by the qualitative fact of our moment as eschaton and kairos. If it is a time of epochal endings, it is also the time in which we can finally tell the story of our own emergence, a story in which life reveals itself as the telos of matter, butterflies and giraffes and humans as the secret longing of molten rock. It is also the time in which we humans are called to a second, more lucid awakening to and as the voice of the wider Earth community.

As for the telos of mind, at least in its human form, the world's great religious traditions each have their proposals, which we recognize in such words as *enlightenment*, *beatitude*, *satori*, *ananda*, *the Kingdom of Heaven*, *nirvana*. For Hegel the ultimate telos is Absolute Spirit (or the Whole knowing itself as the Whole); for Aurobindo, the realization of infinite being-consciousness-bliss (*sat-chit-ananda*); for Teilhard de Chardin, the Omega Point of the Cosmic Christ. Though parallels, overlaps, and convergences arguably exist among the various proposals, there is (happily, to my mind) no universal consensus. One might say that the telos of life is Spirit, as long as we recognize, as Jorge Ferrer (2002) puts it, that the ocean of Spirit has many shores (p. 147).

We need not venture so metaphysically far afield, however, to recognize a more proximate telos for the human presence on Earth. To do so, however, we must continue with a consideration of the other four principles of an integral ecology.

PLANETARY

If the evolutionary principle is primarily concerned with the temporal context of an integral ecology, the planetary principle focuses more on the spatial (recognizing, of course, that the reality under consideration is always in fact a space-time continuum). The importance of the spatial intuition for standard ecology is evident in its stress on the notion of *environment* (literally, the surroundings). The unifying term that describes the relationship(s) of organisms to their environment is *ecosystem*. As is the case with systems thinking in general, the boundaries that define an ecosystem depend on the system being considered. The core insight of ecology, however, is that no system, including individual

ecosystems (such as the Marin County watershed in northern California or the Amazonian rainforest), can be isolated from the (eco)systems in which it is embedded. Thus, while there is obviously a need for more narrowly focused ecological studies, an integral ecology will naturally concern itself with the most inclusive of ecosystems. From one perspective, this would be the cosmos as a whole. And indeed, there can be no integral ecology that does not address matters of cosmology (especially, as we saw in the previous section, an integrally inflected evolutionary cosmology). For pragmatic purposes, however, the natural focus of an integral ecological gaze can be said to rest on the planet as a whole, on Gaia, our *homeland Earth* (see Morin and Kern, 1999).

For such a gaze to be possible, it was first necessary for a sufficient number of humans to have an actual experience, or at least enough evidence in their day-to-day experience, of actually living on a planet. Though humans had spread from Africa to all of the world's continents before the end of the last interglacial period (reaching Australia about 40,000 years ago and the Americas about 15,000 years ago), until fairly recently, the human population lived in mutually isolated communities, each with its own language and origin myths, and in general in complete ignorance of the existence of any but their immediate neighbors, let alone the planet as a whole. This began to change about 500 years ago, however, with the European voyages of discovery and conquest. From this point onward, and at first at a gradually accelerating pace, humans established ongoing communication and exchange between all of the continents and so initiated the Planetary era (see Kelly, 2010, and Morin and Kern, 1999).

The birth of the Planetary era coincides with the beginning of the modern period, dominated by the rise of the West, during which modern science, technology, and industry eventually transformed the face of the planet and led it to the current eschaton. A complex amalgam of utopian idealism and the forces of empire have driven the growth of planetary awareness and our rush to this eschaton. The establishment of the World Expositions (the first in 1851) and the first Parliament of the World's Religions (1893), though both dominated by the colonial powers, capture something of the idealism. The world wars of the twentieth century, themselves not lacking in a certain form of idealism, made explicit how deep are the shadows of our planetary awakening.

Two years mark particularly significant shifts in this awakening. The first is 1945, which, through the atomic bombs dropped on Japan, simultaneously signaled the end of World War II and began the era of the superpowers and the nuclear arms race. The year 1945 also saw the birth of the United Nations, the first international organization devoted to fostering global peace and (what would

later be called *sustainable*) development. The second year is 1970. Midway through the Cold War and nearing the end of the glory days of the space program, the first images of Earth from space were widely diffused and so entered the collective consciousness of humanity. The famous "Earthrise," the "photo that changed the world," was taken in 1968, the same year as the first Earth Day celebration.

It was also in 1969–1970 that James Lovelock, while working as a consultant for NASA, proposed his first version of the Gaia hypothesis (now referred to as Gaia theory). A few years earlier, he had suggested several tests for determining the existence of life on Mars. "One of these," Lovelock (1990) recounts,

> was a top down view of the whole planet instead of a local search at the site of landing. The test was simply to analyse the chemical composition of the planet's atmosphere. If the planet were lifeless then it would be expected to have an atmosphere determined by physics and chemistry alone and be close to the chemical equilibrium state. But if the planet bore life, organisms at the surface would be obliged to use the atmosphere as a source of raw materials and as a depository for wastes. Such a use of the atmosphere would change its chemical composition. It would depart from equilibrium in a way that would show the presence of life. (p. 100)

Later comparing infrared data from Mars with what was known about the chemical composition of Earth's atmosphere, it was possible to determine that Mars does not currently support life. Dominated by carbon dioxide, its atmosphere is in a state of chemical equilibrium. On Earth, by contrast, carbon dioxide is a mere trace element and, Lovelock continues, the "coexistence of abundant oxygen with methane and other reactive gases, are conditions that would be impossible on a lifeless planet. Even the abundant nitrogen and water are difficult to explain by geochemistry" (p. 100). It was these observations that led Lovelock to the central insight of Gaia theory—namely, that Earth is a self-regulating system far from equilibrium, one that has evolved in such a way as to maintain climatic and chemical parameters favorable for life (see also Lovelock, 2007).

This insight clearly accords a central, guiding role to life in the Earth system. From the point of view of mainstream science, the notion of life is limited to the totality of organisms, which together constitute the planet's biosphere. Even if we define the biosphere as including all organisms and their habitable environments, it is dwarfed by both weight and volume by the rest of the Earth system (only 0.00008 percent of the total mass, and 0.0007 percent of the volume.[3]

As quantitatively negligible as this may seem, however, the biosphere has determined the specific chemical profile of the atmosphere (the predominance of nitrogen and oxygen, minimization of carbon dioxide), has preserved the hydrosphere (through biotic fixation of hydrogen), and has shaped the upper reaches of the lithosphere (including not only its chemistry, through bio-assisted rock weathering, but plate tectonics as well) (see Volk, 2003 and Harding, 2006). If we combine these facts with the qualitative appearance of Earth as seen from space—its blue oceans and white clouds and green forests—one might justifiably consider the planet as a whole as alive, as a single *superorganism*.[4]

Despite initial resistance on the part of the mainstream scientific community—a resistance triggered not only by the word *Gaia*, the name of a Greek goddess, but by the specter of teleology (the taboo of purpose)—the central insight of Gaia theory has since gained wide acceptance and is presupposed by the new polydisciplinary field of Earth system science. One of the leaders of this field, H. J. Schellnhuber (1999), has proposed the following:

> At the highest level of abstraction, the make-up of the Earth system E can be represented by the following "equation":
>
> $$E = (N, H) \quad (1)$$
>
> where N = (a, b, c, ...); H = (A , S). This formula expresses the elementary insight that the overall system contains two main components, namely the ecosphere N and the human factor H. N consists of an alphabet of intricately linked planetary sub-spheres, a (atmosphere), b (biosphere), c (cryosphere; that is, all the frozen water of Earth), and so on. The human factor is even more subtle: H embraces the "physical" sub-component A ("anthroposphere" as the aggregate of all individual human lives, actions and products) and the "metaphysical" subcomponent S reflecting the emergence of a "global subject." This subject manifests itself, for instance, by adopting international protocols for climate protection. . .
>
> Global environmental change is all around us now, and the material components of the Earth system, N and A, are behaving like a strongly coupled complex. . .
>
> But H embraces a second sub-factor, S, which makes all the difference. This entity, introduced as the "global subject" above, represents the collective action of humanity as a self-conscious control

> force that has conquered our planet. The global subject is real, although immaterial. (pp. C21–C22)

As we have seen, the biosphere, though quantitatively miniscule relative to the other spheres of the Earth's total ecosphere, is nevertheless qualitatively significant. The same holds for the anthroposphere, which, though itself (from a physical standpoint) a fragment of the biosphere, is responsible for the sixth mass extinction currently underway.[5] What is striking in Schellnhuber's proposal is that he explicitly recognizes an immaterial (and *metaphysical*) planetary ego or *global subject* as integral to the Earth system. In this he was preceded by Teilhard (2008), who claimed that, with the emergence of humans, the planet began to weave another, subtler sphere of mind or consciousness—the *noosphere*.

While I find Schellnhuber's (1999) idea of a global subject a step in the right direction toward a more integral Gaia theory, I would not want to limit the subjectivity of Gaia to the sphere of conscious human egos, at least not in their current ordinary states or modes. Although he is obviously cognizant of, and deeply concerned about, the worsening threats to the planetary ecosphere, Schellnhuber seems to share something of Teilhard's (2008) unbridled confidence in the promethean powers of the human noosphere to control the destiny of the planet, at least in the short to middle term. "The global subject," Schellnhuber writes, "will reign over the centuries to come. One of its most responsible tasks will be to seek out a tolerable environmental future from the infinity of optional co-evolutions of N and A. In other words, S must guarantee sustainable development" (p. 100).

But of course, there is no guarantee. At this critical point of our coevolution, there are only tentative indications of the global subject being "a self-conscious control force" with respect to the ecosphere, or even to its own anthroposphere. With all of our scientific knowledge and technological prowess, we are still struggling to emerge from the "Planetary Iron Age," as Morin (1999) puts it (p. 133ff). Whatever success we might have in becoming "co-pilots of the Earth" (p. 133ff) will depend not only on the adequacy of the increasingly sophisticated models of Earth system scientists, but on a more generalized mutation of consciousness in service of the fledgling Planetary era. Gaia theory and now Earth system science can themselves, as I have suggested, be taken as evidence of such a mutation at the more rarified levels of the noosphere. But even here, more work needs to be done. To understand Earth as a single, self-organizing system is a momentous intellectual achievement. A central task of a more integral Gaia theory, however, will be to illuminate the complex relation between the human and the rest of

the planetary ecosphere. Standard Gaia theory will quite naturally concern itself with a physiology of Earth (see Volk, 2003). Even here, however, the Gaia theorist or Earth system scientist cannot avoid taking the human factor into consideration, if only because Gaia has evolved to the point where the human has itself become a decisive geological force. In very real terms, therefore, there can no longer be a neat division between the natural and human sciences, between Gaia and anthropos.

TRANSDISCIPLINARY

Standard Gaia theory and Earth system science already represent significant challenges to the dominant trend in late modern science toward increasing specialization and disciplinary fragmentation. The sciences of ecology, for their part, are generally following the dominant trend.[6] Even Earth system science remains entrenched on one side of the great rift between the natural sciences and the humanities, despite the fact that, according to one description, it "embraces chemistry, physics, biology, mathematics and applied sciences in transcending disciplinary boundaries to treat the Earth as an integrated system" (Ruzak, 2013, "What is earth system *science*?" para. 1). The kind of poly- or multidisciplinary integration taking place in Earth system science is a necessary, but in itself still insufficient, expression of the transdisciplinarity called for by a truly integral ecology. Such an ecology, write Esbjörn-Hargens and Zimmerman (2009), "unites, coordinates, and mutually enriches knowledge generated from different major disciplines and approaches."

> Integral ecology can be: a) applied within a discipline (e.g., by integrating various schools of ecology); b) applied as a *multi*disciplinary approach (e.g., by investigating ecological problems from several disciplines); c) applied as an *inter*disciplinary approach (e.g., by using social science methods to shed light on economic or political aspects of environmental values); and d) applied as a *trans*disciplinary approach (e.g., by helping numerous approaches and their methodologies interface through a well grounded meta-framework). (p. 2)

To my mind, while an *integrative* ecology may indeed be multi- and interdisciplinary in nature, it is only by becoming *trans*disciplinary that ecology becomes integral.

The word *transdisciplinary* seems to have been coined by Jean Piaget at a conference on interdisciplinarity and higher education, held in Nice in 1970 (the same year, it is interesting to note, as the first Earth Day and the birth of the Gaia hypothesis)[7], where he remarked:

> Finally, we hope to see succeeding to the stage of interdisciplinary relations a superior stage, which should be "transdisciplinary," i.e. which will not be limited to recogniz[ing] the interactions and or reciprocities between the specialized researches, but which will locate these links inside a total system without stable boundaries between the disciplines. (as cited in Nicolescu, 2006, p. 142)

Esbjörn-Hargens and Zimmerman's (2009) "well grounded meta-framework," in the form of the AQAL model, is an example of Piaget's "total system" As with integral ecology itself, however, there is no single path into the transdisciplinary phase.

Three years after Piaget's coining of the term *transdisciplinary* (1973), the Center for Studies in Mass Communications in Paris, under the direction of Georges Friedmann, Edgar Morin, and Roland Barthes, was renamed the Center for Transdisciplinary Studies. From this point onward, Morin has been the leading figure of the center's research activities (in 2008 it was renamed the Edgar Morin Center), which have included the production of many hundreds of publications and dozens of international conferences. In 1994, the year before the simultaneous appearance of the term *integral ecology* in the writings of Boff, Berry, and Wilber, Morin collaborated with physicist Basarab Nicolescu and Lima de Freitas to convene the First World Congress of Transdisciplinarity and the promulgation of the Charter of Transdisciplinarity, whose 14 articles are equally relevant to the project of integral ecology (and integral theory in general).

"Transdisciplinarity," writes Nicolescu (2002),

> concerns that which is at once *between* the disciplines, *across* the different disciplines, and *beyond* all discipline[s]. Its goal is the understanding of the present world [an understanding in service of the entire Earth community, as the Charter makes clear], of which one of the imperatives is the unity of knowledge. (p. 44)

In response to this imperative, Nicolescu proposes three pillars of transdisciplinarity: (1) multiple levels of reality (addressing the question of ontology), (2) the logic of the included middle (addressing logic), and (3) complexity (addressing

epistemology or the question of method). The idea of multiple levels of reality will be familiar to anyone acquainted with traditional, premodern, or esoteric worldviews. Though not without interest, Nicolescu's presentation of three distinct realms seems somewhat simplistic when compared with the much richer and fully articulated descriptions of multiple levels of reality that one finds in such figures as Aurobindo, Steiner, Wilber, and Stanislav Grof, for instance. In any case, Nicolescu draws particular attention to the discontinuity between, on one hand, the material world as normally experienced, which more or less conforms to the laws of Newtonian physics, and on the other hand, the quantum realm, which requires its own laws or principles of intelligibility (notably, the principles of complementarity, uncertainty, and nonlocality). A third level, disclosed by certain kinds of nonordinary experience (which Grof would call holotropic), offers the possibility of intuiting the unitary reality that grounds the other two levels.

Though Nicolescu (2002) himself doesn't make the point, it would seem that, from an ecological point of view, the main levels of reality to be considered are those of the geosphere (or physiosphere), the biosphere, and the noosphere. These levels correspond to the traditional ontological levels of matter, life, and mind. Wilber (1995) has proposed a fourth sphere—the theosphere (the level of Spirit)—of which I will have more to say in the next section. Mainstream, disciplinary ecology grounds itself in the scientific study of the biosphere and its relations to the geosphere (with the study of biogeochemical cycles, for instance). By contrast, an integral, and therefore transdisciplinary, ecology is more concerned with the principles of intelligibility that allow for free passage between spheres (or levels or quadrants). For Nicolescu (2002), such passage demands a new kind of logic—that of the included middle—as a counter to the still dominant logic of the mechanistic paradigm. While I agree with Nicolescu that there is such a need, his proposal for a new logic is, to my mind at least, an impoverished version of the Hegelian dialectic. A much more coherent engagement with dialectical thinking is provided by the philosopher of science, Errol Harris (see especially Harris, 1987) and Nicolescu's sometime collaborator, Edgar Morin (on the relation of Hegel to Morin, see Kelly, 1988). I will not repeat here what is covered in the separate chapter of this book devoted to Morin. In this context, I would point out that Morin's understanding of the principles of complexity—especially the dialogic, the holographic principle, and recursivity—take us far beyond the old, reductionistic logic.

As for the third pillar of transdisciplinarity—complexity—Nicolescu (2006) remarks that it "is a modern form of the very ancient principle of universal

interdependence" (p. 153). While this is true enough, it does not take us very far. For Morin (1977), by contrast, the method or "way" of complexity—which is nothing other than the logic of transdisciplinarity—is that which allows us "to re-member the mutilated, articulate the disjointed, and think the obscured" (p. 23).[8] The challenge of complex thinking at the heart of transdisciplinarity

> involves the task of holding together, without incoherence, two (or more) ideas which are nonetheless contrary to one another. This is not possible unless we find, a) the meta-point of view that relativizes contradiction, and b) a way to insert into a productive feedback loop antagonistic concepts which thereby also become complementary (p. 379).

As noted in the previous section, the main theoretical contradiction finds expression in the rift between the natural and human sciences. An analogous contradiction is evident in the continuing tension between nonanthropocentrism (biocentrism and ecocentrism) and anthropocentrism in environmental ethics, a tension that also shows up in the contrasting positions of two of the founding figures of integral ecology: Thomas Berry and Ken Wilber. Berry's position on environmental ethics is decidedly ecocentric in emphasis. "The ecological community," Berry (1996) asserts,

> is not subordinate to the human community. Nor is the ecological imperative derivative from human ethics. Rather our human ethics is derivative from the ecological imperative. . . The Earth is not part of the Human Story, the human story is part of the Earth Story. (p. 8)

Clearly, however, Earth is part of the Human Story. It is a question, rather, of how Earth figures in the human story, and vice versa. Not only are there multiple stories on both counts, but the meaning of the stories is always subject to more than one reading. Elements of the Biblical story, for instance, have been interpreted by some to justify the domination of nature, by others to argue for the ideal of stewardship, and by yet others to suggest a more mystical and participatory view of the human-nature relation (see Bunge, 1994, and Baker, 1990).[9]

In stark contrast to Berry's ecocentric position, Wilber (2001) states:

> The fact that all holons [in this case, organisms] have equal Ground-value is confused with the notion that they must therefore all have equal intrinsic value ("bioequality"), and this

> completely paralyzes any sort of pragmatic action at all. It is much better to kill a carrot than a cow, even though they are both perfect manifestations of Spirit. They both have equal Ground-value, but one has more intrinsic value because one has more depth (and therefore more consciousness). (para. 6–7)

Wilber's position is consistent with the view, explored above in the section on the evolutionary principle, that life is the telos of matter, and mind the telos of life. We could extend this line of thinking to say that the biosphere is the telos of the geosphere, and the anthroposphere is the telos of the biosphere. In other words, it is only in and as human self-consciousness that the full potentials of matter and life (at least here on Earth) can be fully actualized. Whether in fact they will ever be fully actualized is another matter. We have seen that we are still in the Planetary Iron Age, but in principle, at least, the teleo-logic of Wilber's position is sound. The complexity of our evolutionary moment, however, calls for this kind of teleo-logic to be articulated with the kind of eco-logic represented by Berry, an articulation that Morin (2008) attempts when he writes:

> The world cannot appear as such . . . as the horizon of the eco-system, the horizon of *physis* [nature], without a thinking subject, the ultimate development of self-organizing complexity. But such a subject cannot appear except through a physical process, through which the phenomenon of self-organization developed, in a thousand steps, always conditioned by an eco-system becoming richer and vaster. And so the subject and the object emerge like two ultimate, inseparable consequences of the relation between the self-organizing system and the eco-system. (p. 23)

As for Wilber's (2001) appeal to pragmatic considerations, it appears to me that Berry (1996) is more sensitive to the pragmatic criticality of our evolutionary moment. While it may be the case, from a teleological point of view, that the anthroposphere represents a higher degree of actualization than the rest of the biosphere considered in isolation from the human, it is of course the case, as Morin (2008) points out above (and as Wilber himself recognizes),[10] that there can be no anthroposphere (or thinking subject) without the biosphere (the eco-system as object). The biosphere is not only integral to our evolutionary history and constitution, it is our very home (*oikos*). In trying to halt the collapse of the biosphere, we are also trying to halt the growing possibility of our own extinction.

Berry's (1996) position, however, is not merely pragmatic, nor is he calling for a new, ecocentric ethic merely as a means of preserving a meaningful human presence on the planet, which would amount to a provisional and instrumental ecocentrism in the service of a more fundamental anthropocentrism. "The basic ethical norm," as Berry says, "is the well-being of the comprehensive community, and the attainment of human well-being within this comprehensive community" (p. 8). Berry's meta-point of view, therefore, is that of the Earth community or Gaia as an integral whole. For Wilber (2001), on the other hand, the meta-point of view is provided by the AQAL version of integral theory, within which Gaia is understood as an intermediary level in only one of the four quadrants.

While it is probable that Berry and Wilber would agree on many essential points regarding the gravity of our planetary situation, factors that have contributed to its emergence, and even on specific matters of environmental policy, theoretical tensions between the two approaches remain. One important task of integral ecology will be to explore such tensions in ways that lead to better mutual understanding and to the possibility of novel and generative theoretical outcomes. The tension between the integral approaches of Berry and Wilber, which in significant respects reproduces the more pervasive disciplinary tension between the natural and the human sciences, is an invitation to the kind of transdisciplinary thinking invoked by Morin (1977) when he writes that the meta-point of view

> can only be a retroactive/recursive loop that does not annul, but rather feeds on those contrary movements without which it would not exist and which it integrates into a productive whole. In this way the antagonistic character of the [bio-]physical and of the anthropo-social points of entry becomes not only that which impedes, but also that which is necessary to, the constitution of the meta-system. . . It is in and through this loop or circuit that we can establish a twofold theoretical rooting in both "nature" and "culture," in the "object" as well as the "subject." (p. 276)

(RE)ENCHANTED

Transdisciplinarity, it will be recalled, "concerns that which is at once *between* the disciplines, *across* the different disciplines, and *beyond* all discipline[s]" (Nicolescu, 2002, p. 44). The previous section explored some ways in which an integral ecology moves beyond—*trans*/*meta*—the dominant tendency toward disciplinary

fragmentation. It is worth remembering that the disciplinary mind of modern science—which, as we have seen, extends to standard ecology as well—was schooled within the wider cultural process of what sociologist Max Weber called the "disenchantment (*Entzauberung*) of the world." For the ancients as well as for medieval and most Renaissance practitioners of *natural philosophy*, the cosmos was seen as pervaded with spiritual meaning. The Platonic notion of the World Soul (*anima mundi*); the Stoic idea of the cosmic Logos; Saint Paul's view of the world in labor with the cosmic Christ; Saint Francis's relationship to animals and to "Brother Sun and Sister Moon"; the magical correspondences between minerals, plants, animals, stars, and other heavenly beings of the alchemists; the two parallel "books" of revelation of the theologians (the book of scripture and the book of nature): these and other related notions all manifest the essential quality of what Owen Barfield (1988) calls "original participation," by which he means a mode of being and of consciousness that involves the idea that there exists,

> behind the phenomena, *and on the other side of them from me*, a represented which is of the same nature as me. Whether it is called "mana," or by the names of many gods and demons, or God the Father, or the spirit world, it is of the same nature as the perceiving self, inasmuch as it is not mechanical or accidental, but psychic and voluntary. (p. 42)

There are, to be sure, significant differences among the notions Barfield lists, or among those I listed above, for that which was thought to exist "behind the phenomena." The sequence leading from "mana" through "many gods" to "God the Father," for instance, arguably reflects an evolution of consciousness that itself involves increasing degrees of disenchantment, to the extent that the sacred or divine is associated with ever-greater transcendence relative to the everyday world of the profane. Compared with the secularized worldview of the later modern period, however, the worldviews associated with all of the notions listed are participatory insofar as they share the fundamental idea of an ontological continuity, however mediated, between the sacred and the profane.

In its extreme form, the later modern worldview denies the sacred altogether. This does not mean, however, that this worldview is without its idols. Something functionally equivalent to mana or gods persists wherever there is "ultimate concern" (Paul Tillich's term for the religious function), even if this concern is reserved for such notions as the "laws" of physics, selfish genes, power, or profit. Still, in the late modern worldview, whatever the object of ultimate concern, the tendency has been toward the view that "the human self," as Richard Tarnas

(2006) summarizes the situation, "is an infinitesimal and peripheral island of meaning and spiritual aspiration in a vast purposeless universe signifying nothing except what the human self creates" (p. 34).

If the premodern worldviews can be characterized as manifesting various forms of original participation, the late modern can be seen as tending toward "idolatry," which involves an instrumental relationship to phenomena as mere "things" without intrinsic meaning or value. Happily, however, Barfield (1988) also envisions the possibility of a *final participation*, and indeed not only the possibility, for its essential traits have been recognized and elaborated on as early as the first great countercultural projects of the Romantics and Idealists (Goethe, Schelling, Hegel) and those who have followed in their wake (Fechner, Jung, Steiner, Barfield himself, and many others) (see Kelly, 2010). Prominent among these traits is the aspiration toward a *re-enchantment of the world*. In contrast to original participation, however—and reflecting the intervening phase of modernity—the re-enchantment of final participation goes hand in hand with the recognition of the principle of evolution (of the dynamic type first articulated by Schelling), with a critical sensibility informed by the postmodern turn (in this case, with a constructive rather than a merely deconstructive inflection[11]), and increasingly, with an awareness of our crisis-ridden planetary context. The notion of final participation, in other words, overlaps considerably with the principles of integral ecology explored in this chapter.

As for how an integral ecology might approach the ideal of re-enchantment, various possibilities present themselves. As we saw in the previous section, Berry's (1996) biocentric approach takes the entire Earth community as the focus of ultimate concern. The same is true for Morin (2008), as seen in his proposal for a new species of religion based on the fact and ideal of planetary solidarity or "re-liance" (pointing to one etymological derivation of the word "religion"—from the Latin: *re-ligare*, to "tie back together") (see the chapter on Morin in this volume). Though heavily indebted to Teilhard, Berry and Swimme (and Morin, for that matter) consider Earth, and the wider cosmos of which it is an expression, as the ground of the sacred. In this way, one could argue, they implicitly reject Teilhard's panentheistic theology,[12] which conceives of the cosmos as the "body" of a Deity (the cosmic Christ) who retains a certain degree of transcendence over the material cosmos. At the very least, they remain agnostic about this and other meta-physical possibilities, preferring instead to concentrate on the inherently sacred character of our embeddedness in the physical cosmos.

Wilber, by contrast, explicitly aligns himself with the panentheistic tradition, drawing not only from Teilhard, but from Whitehead, Plotinus, Emerson,

Aurobindo, and certain strands of (especially Buddhist) esoteric teachings. His contribution to this tradition can be seen, as Zimmerman (2005) puts it, as an "effort to integrate nature, humankind, and Spirit [or ecosphere, anthroposphere, and theosphere] in order to form a constructive postmodernism that re-enchants the world without inviting personal and social regression" (p. 1,744). To guard against such regression, they maintain that, though the cosmos is indeed fundamentally sacred or divine (recall Wilber's distinction between ground and intrinsic value), as physical or material nature (nature with a lower case *n*), it is to be conceived as "but the lowest-level manifestation of Nature, understood as creative Spirit" (p. 1,744).

What they propose, in other words, is a version of the perennialist Great Chain (or Nest) of Being, the basic "levels" of which, as mentioned previously, are matter, life (matter and life being subsumed under "nature"), mind, and Spirit (or again, from an ecological perspective: ecosphere, anthroposphere, and theosphere). The levels are said to be hierarchically/holarchically related, such that "higher" levels transcend and include the lower, but not the reverse. Life, for instance, clearly "includes" matter insofar as it presupposes the chemical interactions by means of which cells are organized. Mind or consciousness, similarly, "includes" life insofar as some kind of living organization is necessary for the emergence of such mental processes as perception and thinking.

This sense of inclusion-as-dependence seems straightforward enough, but what does it really tell us apart from the fact that some forms of matter are organized in such a way that we recognize them as living, and that some forms of living organization manifest qualities that we associate with consciousness? We could just as easily say that matter "includes" life as a potential form of organization, and that living beings "include" mind or consciousness as one of their organizational potentials. As we saw above, if life is said to "emerge" out of matter, then life must somehow already be "in" matter as one of its hidden potentials. The same is true of the relation of mind or consciousness to life and matter. Indeed, the idea that the lower "includes" the higher as both potential and telos is, as we have seen, a core insight of the grand evolutionary perspectives of such figures as Aurobindo, Teilhard, and Swimme. To say "not the reverse," privileges involution over evolution and only makes sense from an introverted, subjective-idealist metaphysical position. (see Kelly, 2008)

The notion that the higher transcends the lower, if not qualified, is also problematic. It is true that more complex forms of organization allow for the emergence of novel properties not possessed by the elements of which the more complex forms are constituted. To take a very simple example, animals can (and must)

drink water to live. Two parts of liquid hydrogen to one part of liquid oxygen (the simpler constituents of water), however, cannot serve as substitutes! In this way the "higher" (H_2O) both includes and transcends the "lower" (O). Conversely, however, oxygen-respiring organisms cannot make due with a lungful of water! To paraphrase Morin (2008), we could say that, while the holon (in this case, the water molecule) is more than the sum of its parts (hydrogen and oxygen atoms), it is also less, in that properties of the parts are lost (in this case, the breathability of oxygen), virtualized, inhibited, or repressed once the parts get taken up into more complex forms of organization. This becomes even more obvious the "higher" one moves along the Great Chain or Nest of Being, as we know from the work of psychodynamic psychology (which recognizes the inevitability of repression and dissociation in human development) and critical theory (which highlights the ubiquity of oppression in social organization) (see Kelly, 2008).

Just as life can be understood as the telos of matter and mind as the telos of life, so the anthroposphere can be seen as the telos of the ecosphere. Here again, however, the "transcend and include" of any supposed hierarchical/holarchical organization needs to be qualified. The human potential to transcend the constraints of matter and life as normally understood has gone hand in hand with a now-critical dissociation of the anthroposphere from the ecosphere. The human presence on the planet has disrupted key bio-geo-chemical cycles and even threatens the viability of the majority of world's species. At this point, at least, any talk of the anthroposphere including the ecosphere has a hollow ring to it.

But what of the theosphere? Clearly, much depends here on how one understands the meaning of such terms as *Spirit*, the *sacred*, or the *divine* (*theos* or *to theon*). Personally, I find a minimalist version of the panentheist vision (which I imagine even Swimme and Morin would find acceptable) to be the most accommodating. By minimalist here I mean the simple recognition that the sacred or divine in some sense simultaneously pervades the cosmos and surpasses any attempt to delimit its ultimate nature and boundaries. From this perspective we could say that the theosphere does indeed both transcend and include the ecosphere, although, given the all-pervasiveness of Spirit, we would have to say that it is also included in the ecosphere. This kind of minimalist panentheism also encourages a willingness to suspend judgment regarding the ranking of religious or spiritual traditions or disclosures (for example, Wilber's view that "subtle" or "Deity mysticism" is superior to "psychic" or "nature mysticism") (see Wilber, 1995, 287ff). Of course, most of us will have our own assessments and personal commitments, but it should be clear by now that no argument as to the relative superiority of one tradition over another, however compelling to some, will

succeed in winning over those with seemingly incompatible views. This is not to say that we should avoid all comparison and critique, only that we should proceed with theoretical circumspection and metaphysical humility.[13]

Keeping the above considerations in mind, an integral-ecological understanding of the theosphere can be assisted by Gebser's general approach to the idea of structures of consciousness (particularly the magical, mythic, mental, and integral). Wilber has already done much to introduce Gebser to a wider audience and has made his own sophisticated contribution to an understanding of the structures. There are significant differences, however, between their approaches. Most notably, though Gebser recognizes that the structures emerged more or less sequentially as discontinuous "mutations" in the evolution of consciousness, he does not see them as hierarchically/holarchically organized. This is not the place for an extended discussion of the structures, but perhaps I can devote a few words to suggest how they might function as distinct modes through which the theosphere tends to manifest.

We have already seen how the materialistic and mechanistic paradigm can be taken as an expression of the hyper-perspectival, "deficient" mental structure (which Gebser also calls the "rational" structure, though perhaps "rationalistic" would be a better term). It is with the dominance of this deficient mental structure that we have Barfield's "idolatry" and the total disenchantment of the world (an eclipse of the theosphere, in effect). It is also, however, within the late-modern culture of idolatry that we see the emergence of the integral mutation. Again, I cannot, in this context, do justice to the richness of Gebser's understanding of the integral structure. Here I would point to what is perhaps its most distinctive characteristic: *diaphaneity* (or transparency). Unlike the other structures, which are mutually opaque to one another, the integral structure is, to varying degrees, diaphanous or transparent to the other structures, as it is to the mysterious Origin (*Ursprung*), which is both source and goal, *arche* and *telos* of the evolution of consciousness.

I say "to varying degrees" since expressions of the integral mutation must transpire, for the time being at least, from within a culture still in the grips of the deficient mental structure. Thus, for example, Wilber's (1995) AQAL model, and the integral ecology on which it is based, seeks to honor the virtue of all of the structures and explicitly recognizes the pervasiveness of Spirit as both ground and summit of the Kosmos. At the same time, however, by assimilating the structures to the notion of "levels" within the four "quadrants," one can see the persistence of (rational) perspectival thinking. Still, when subjected to a certain softening of the categories[14] (and of categorial thinking in general), the AQAL approach is

arguably the most compelling example of a comprehensive integral philosophy refracted, as it were, primarily through the mental structure.[15]

Whereas the mental structure discloses Spirit primarily by means of abstract categories and concepts (especially that of system), the mythic structure privileges metaphor, symbol, and literate narrative. The work of Berry and Swimme clearly makes good use of the mental structure. After all, Berry was trained as a cultural historian and Swimme as a mathematical physicist. Berry's much-quoted injunction to relate to Earth (and not merely to other humans, as in Kant's original formulation of the categorical imperative), not as a collection of objects, but as a communion of subjects, is a sublime expression of the best of what the mental structure has to offer. At the same time, however, the titles of Berry's best-known works—*The Dream of the Earth* (1990), *The Universe Story* (coauthored with Brian Swimme) (1992), and *The Great Work* (1999)—as well as the books and video productions of Swimme—*The Universe Is a Green Dragon* (1984), *The Hidden Heart of the Cosmos* (1999), *The Journey of the Universe* (coauthored with Mary Evelyn Tucker; 2011), *Canticle to the Cosmos*, *Earth's Imagination*, the *Powers of the Universe*—all attest to the primacy of the mythic structure in their approaches. Or perhaps it would be more correct to say that, as with Wilber, the integral structure is primary, but in this case in a manner that is especially transparent to the mythical structure.

With the magical structure, Spirit needs to be felt, sensed, and embodied. Its preferred mode of expression is not conceptual abstraction or literate narrative, but invocation and incantation. Again, since we are living in a late-modern culture, the mental structure will naturally be in evidence, and even most likely the base from which any integral impulses radiate. A striking example of an ecological approach that, though working from the mental structure, is especially transparent to the magical is the work of David Abram. The titles alone of his two books give a good indication of the nature of this transparency: *The Spell of the Sensuous: Perception and Language in a More than Human World* (1997); and *Becoming Animal: An Earthly Cosmology* (2011). As one of many representative passages I could choose to illustrate what we could call magical diaphaneity, consider the following from one of Abram's (n.d.) essays:

> Our animal senses know nothing of the objective, mechanical, quantifiable world to which most of our civilized discourse refers. Wild and gregarious organs, our senses spontaneously experience the world not as a conglomeration of inert objects but as a field of animate presences that actively *call* our attention, that *grab* our focus or *capture* our gaze.

> Whenever we slip beneath the abstract assumptions of the modern world, we find ourselves drawn into relationship with a diversity of beings as inscrutable and unfathomable as ourselves. Direct, sensory perception is inherently animistic, disclosing a world wherein every phenomenon has its own active agency and power. (para. 9)

Abram is one of the cofounders, along with Stephan Harding, of the Alliance for Wild Ethics. Harding has worked closely with Lovelock over the years, extending and deepening his mentor's version of Gaia theory. Lovelock's version is firmly anchored in the mental structure, though his bold decision to name the theory after a goddess began to clear a spot on the surface of the soot-encrusted pane of the mental structure. In Harding's (2006) hands, as we see in his major written work, *Animate Earth: Science, Intuition, and Gaia*, the living glow of the magical structure is clearly seen and felt. Though firmly anchored in the mental structure of the standard Earth sciences, not only does Harding consider Earth to be a living being, but in keeping with the panpsychism typical of the magical structure, the very molecules of life (carbon, hydrogen, nitrogen, phosphorus, and sulfur) are given distinct personalities consistent with their individual modes of agency. "Attraction and repulsion," he writes,

> have something to do with the intelligence, with the "soul" of the universe itself—they are the manifestation at the level of matter/energy of the participatory nature of electrons and protons, perhaps no different in principle to the attractions and repulsions that we humans feel towards each other. Thus, atoms, like humans, are constantly trying to find fulfillment. (p. 89)

An extended discussion of the principle of (re)enchantment in the context of integral ecology could include other, more explicitly religious, theological, or broadly spiritual approaches that have not been considered in this section, including those based in indigenous traditions, the world religions, neopaganism, and esotericism.[16] To conclude this section, I would mention an interesting example of an esoteric approach in which the magical and mythic structures are both in evidence. Marko Pogacnik (2008), an artist, geomancer, and "earth healer," has described his approach as *holistic ecology*. By this he understands an ecology that holds "a pluridimensional view of life, the planet, and the landscape" (p. 233). The practice of this holistic ecology includes working with "vital-energy centers or flows of vital powers," the perception and balancing of "masculine and feminine

powers" in the landscape, and interacting with "elemental beings and environmental spirits" (p. 233). A fascinating practice Pogacnik (n.d.) has developed is that of "lithopuncture" or "Earth acupuncture," where specially carved stones are placed at critical sites to effect healing by intervening in the subtle body of Gaia. "With methods similar to acupuncture and homeopathy," he writes, "it is possible to approach the vital, conscious and spiritual levels of a place, a town or a landscape" (para. 18).

Whatever one might think of the efficaciousness of the kinds of practices advocated by Pogacnik, his conviction that human beings are called to assume an active role in the healing of our ailing planet highlights a crucial feature of more integral approaches to ecology. Integral ecologies, and this in contrast to the still dominant view of science as something purely neutral, objective, and dispassionate, are forms of *activism*.

ENGAGED

The theories and findings of scientific ecology have always been looked upon as having practical applications (for resource management or ecosystem assessment restoration, for example). Active engagement in countering perceived threats to the integrity of the natural environment, however, was taken up by members of the conservationist and environmentalist movements. Informed by scientific ecology, environmental science or environmental studies, which emerged along with the post-sixties blossoming of the environmental movement, is generally directed to issues of public policy. As a discipline, or interdiscipline, it is clearly more explicitly engaged in the field of social and political action. Unambiguously engaged stances are apparent in such fields as political ecology, social ecology, socialist ecology, deep ecology, and ecofeminist ecology, among others. Whether or not such engaged ecologies (using the term in the broader sense, not limited to practitioners of scientific ecology) could also be considered *integral* would depend on the presence, or lack thereof, of the other four principles, and on one's relative weighting of those principles.

The modern environmental movement was arguably launched with the publication of Rachel Carson's (1962) *Silent Spring*, a classic early expression of an integral ecology. While the evolutionary, planetary, and (re)enchanted principles are not especially evident (as they are, by contrast, in her earlier book, *The Sea Around Us*, 1951/1991, and her later *The Sense of Wonder,* 1965/1998), they are nevertheless implicit. The force of *Silent Spring* lies in its transdisciplinary

orientation (highlighting links between the environment and the political economy, challenging the dominant worldview of technological progress) in the service of an engaged concern for the well-being of all living things. In this concern, Carson was clearly following in the footsteps of Aldo Leopold, whose earlier *A Sand County Almanac* (1949/1986), with its emphasis on the intrinsic value of a diverse and resilient biotic community, established the foundations for much of subsequent environmental ethics.

The decades following the birth of the environmental movement have witnessed a mounting wave of engaged ecological writing in response to the worsening planetary ecological crisis. An impressive example of contemporary engaged ecological/environmental writing that could be considered integral is Naomi Klein's 2014 book, *This Changes Everything: Capitalism vs. the Climate*. The evolutionary and planetary principles are evident in Klein's recognition that humanity, and indeed the entire Earth community, is poised on a threshold with, on one side, catastrophic climate change and its genocidal and ecocidal consequences, and on the other, the possibility at least of a sustainable Earth community. Klein seizes on the critical and complex character of the climate moment as offering

> an overarching narrative in which everything from the fight for good jobs to justice for migrants to reparations for historical wrongs like slavery and colonialism can all become part of the grand project of building a nontoxic, shockproof economy before its too late. (p. 154)

Klein's passionate engagement with the climate crisis is notable for the many links she reveals between the science of climate change and the political economy. While she considers many instances of resistance to the extractive economy that is driving the crisis, along with many specific proposals for sustainable alternatives, she maintains that,

> Fundamentally, the task is to articulate not just an alternative set of policy proposals but an alternative worldview to rival the one at the heart of the ecological crisis—embedded in interdependence rather than hyper-individualism, reciprocity rather than dominance, and cooperation rather than hierarchy. (p. 462)

Such an alternative worldview is necessary "not only to create a political context to dramatically lower emissions," but because

> in the hot and stormy future we have already made inevitable through our past emissions, an unshakable belief in the equal rights of all people and a capacity for deep compassion will be the only things standing between civilization and barbarism. (p. 462)

An essential feature of all five principles of integral ecology is resistance to the tendency of the dominant mechanistic paradigm toward reductionism and fragmentation, a tendency that well serves the goals of the ecocidal extractive economy. With respect to the principle of engagement, a manifestation of this tendency is the common assumption that theory and practice, or more generally consciousness and action, arise out of, or inhere in, something like Descartes's two ontologically sequestered substances (*res cogitans* and *res extensa*, or mind and matter). From an integral perspective, however, this assumption must be challenged, as indeed it has been in one form or another by all of the integrally oriented figures mentioned in this chapter.

In this connection, a figure not yet considered is especially relevant to the principle of engagement, and indeed to the project of integral ecology in general. Joanna Macy is variously described as a deep ecologist, systems thinker, Buddhist philosopher, and activist. In fact, however, each of these terms, in Macy's hands, and heart-mind, are mutually implicated. Deep ecology, systems thinking, and the Buddha dharma each provide alternatives to Cartesian dualism: the idea and experience of an embedded, deepened, and extended ecological self (Arnie Naess), the unity of Mind and Nature in the pattern that connects (Gregory Bateson), and the Buddhist insight into the mutually causal, dependent co-arising of all phenomena. According to Macy, these and other related insights from the new science and the world's diverse spiritual heritage can help catalyze a generative shift in perception, cognition, and being in the world. This shift constitutes the third, most fundamental dimension of the Great Turning from Industrial Growth Society to a Life-Sustaining Society in partnership with the whole Earth Community. (see Macy 1998, 2007).

The second dimension of the Great Turning has two complementary sides, a critical and a constructive. The critical side takes the form of analysis of the structural causes of our planetary predicament, and an uncovering of the dynamics of Industrial Growth Society and its plagues: ecospheric devastation, social injustice, and psychosocial and spiritual malaise. The constructive side involves the creation of alternatives to current social, economic, political, legal, and educational arrangements—too many to list here (see lists in Macy, 1998; also Brown, 2009; D. Korten, 2006; Hawken, 2007; and Morin, 2011).

The first dimension is what most people associate with the notion of activism and consists of holding actions in defense of the greater Earth Community. These include "all the political, legislative, and legal work required to slow down the destruction, as well as direct actions—blockades, boycotts, civil disobedience, and other forms of refusal" (Macy, 1998, p. 17). Klein's (2014) extended reporting on, and advocacy of, the global phenomenon of "Blockadia" (293ff.) well exemplifies the nature and importance of holding actions. All three dimensions of the Great Turning, however, as intentional modes of engagement with the planetary *kairos*, are forms of activism. It is only from the point of view of the dominant, dualistic paradigm that the most easily visible, first dimension alone qualifies as activism. In contrast to this view, I have proposed the idea of a spectrum of action, ranging from the more manifest to the more subtle. In this way we can appreciate how the third dimension—the insights leading to a shift in consciousness, as well as the critical moment of the second dimension—are not to be diminished as "merely" subjective or theoretical processes, but must be honored as genuine, and essential, forms of active engagement in the Great Turning.

Theoretical expressions of integral ecology, therefore, as examples of the third and second dimensions of the Great Turning, are themselves instances of what I and others call *subtle activism* (see Kelly, n.d., "The Hidden Face of Wisdom"; Nicol, 2015) The same holds for all engaged ecological writing, especially when it rises to the level of a Naomi Klein or Bill McKibben. Other, more experientially inflected, forms of subtle activism include actions for the protection, healing, or well-being of the Earth Community—Pogacnik's (2008) geomantic interventions would fall into this category, as would the Tibetan-inspired movement for the ritual burial of consecrated "Earth Treasure Vases" at vulnerable planetary hotspots (Earth Treasure Vase, n.d.). Given the planetary dimension of integral ecology, a significant and increasingly popular form of this kind of subtle activism involves the new phenomenon of global meditations. The first synchronized event of this type was the Harmonic Convergence in 1987, organized by Jose Arguelles and inspired by an interpretation of a critical transition point in the Mayan calendar. The end of the so-called Long Count of this calendar (December 21st, 2012, closing a 5,126-year cycle; the starting point, it is interesting to note, corresponds to the beginning of the historical period) was the occasion of many such events. The invitation to the 1997 global meditation organized by Jim Fournier (then a student in the recently founded program in Philosophy, Cosmology, and Consciousness at the California Institute of Integral Studies) as part of the GaiaMind (1997) Project reads as follows:

> Imagine people all over the world sharing a moment of meditation and prayer, a moment of unified global consciousness when people from the world's many diverse spiritual traditions simultaneously focus attention on our interconnected relationship with Gaia—the living earth. Each person bringing love, compassion and understanding to embrace the possibility of healing the social, ecological and spiritual challenges before us. As we approach the dawn of the new millennium, increasingly aware of our interdependence, we may choose to join together as a global community in such a moment to catalyze planetary transformation by both envisioning the light and facing the darkness of our times. (para. 1)

All five principles of integral ecology are evident in this call to action. There is a strong sense, poised on the threshold of the new millennium, of our *evolutionary kairos*. As a global meditation, the context is obviously *planetary.* Informed as it is by insights from the natural, social, and human sciences—as well as being open to dimensions of knowledge and experience that transcend the paradigmatic constraints of the sciences as normally conceived—the project is *transdisciplinary* in scope. The principle of *enchantment* is not only manifest in the explicit appeal to the world's religious and spiritual traditions, but more generally in the sense of conscious participation in the *anima mundi*, the "Mind" of Gaia.

Among the many initiatives that have followed in the wake of these pioneering efforts, I would mention the Gaiafield Project and its associated Subtle Activist Network, Center for Subtle Activism, and Gaiafield Alliance (Gaiafield Center for Subtle Activism, 2015). The project was founded by Leslie Meehan, David Nicol, and myself to help coordinate and catalyze "a multi-hub planetary network of subtle activists who participate in large-scale collective healing and global transformation programs following the Gaiafield Principles, which are in alignment with the broad principles set out in the 'Earth Charter,'" namely:

- Respect and care for the community of life
- Ecological integrity
- Social and economic justice
- Democracy, nonviolence, and peace

Following a successful staging of a live meditation event linking participants at the California Institute of Integral Studies, Findhorn College in Scotland, and Auroville in India, along with individual online participants from around the

globe, the Gaiafield crew organized two other live multisite and online events (with an online educational and experiential program leading up to the main events) in support of the best-possible outcome for the 2008 U.S. presidential elections (WiseUSA), for key events related to global response to climate change (WiseClimate), and for a series of events leading to and including 12/21/2012, a date that, whatever one may think about the Mayan calendar, became a kind of strange attractor for those attuned to the sense of *kairos* and *eschaton* that pervades our evolutionary moment.

Awakening to the potential of subtle activism in no way diminishes the need for more manifest actions (Macy's first dimension of the Great Turning) resisting business as usual and aiming at the transformation of concrete social and political power relations. Consciousness (or mind or Spirit) is clearly embedded in these relations, which, however, are equally embedded in consciousness. The relation between the two is complex, and any view that privileges one over the other can be taken as a manifestation of the paradigm of simplification. Just as not everyone is suited for the kind of frontline activism we associate with the heroic young man who stood steadfast before the tank in Tienanmen Square or the hundreds arrested for protesting the Keystone XL pipeline, not everyone is called to the path of subtle activism. The point is simply that, from an integral perspective, participation in the Great Turning demands engagement from across the entire spectrum of action, each according to their particular gifts and as the occasion arises. Anything less, this late in the game, can only be counted toward our collective disadvantage.

CONCLUDING REMARKS

I noted in the opening section of this chapter that each of the five principles implies the others and that only after having considered all five does a more integral (though by no means exhaustive) understanding of each of them begin to emerge. We saw how the evolutionary telos of the cosmos is woven into in the complex layering of Gaia's planetary spheres; how the nature of this layering calls for a transdisciplinary (meta-) point of view that not only overcomes the modern split between the natural and human sciences, between fact and value, but also helps clear a path toward a re-enchantment of the world; how such re-enchantment, itself a prime expression of the planet's evolutionary telos, manifests diversely through the structures of consciousness; and how, finally, the project of

integral ecology not only demands engagement in the planetary kairos, but even as a form of theoretical inquiry, constitutes an essential mode of such engagement.

Just as the diaphaneity of the integral mutation allows each of the structures of consciousness to serve as a primary focal point for the variety of possible expressions of an integral ecology, so it is with the five principles. Though each of the five principles is active in one way or another with all of the integral ecologists considered in this chapter, one or two tend to take center stage. For Esbjorn-Hargens and Zimmerman (2009), the principle of transdisciplinarity (in the form of system) is primary, as it is for Morin (2008) (in the form of method), with the principles of evolution and re-enchantment also strongly in evidence for the former, and planetarity[17] and engagement for the latter. For Berry and Swimme, the evolutionary principle is primary, though in a way that is intimately bound to that of re-enchantment. For Macy, though the other four principles are clearly active, they are active in a way that channels them directly through the principle of engagement.

The interpenetrating or mutually implicative character of the five principles points to an essential quality of integral thinking, which, in contrast to the reductive and fragmenting tendency of standard disciplinary discourse, is guided by an intuition of a particular kind of wholeness. The wholeness in question is not simple (or simplistic), but complex. It is a wholeness that, like that of life itself, of the living Earth and the cosmos at large, is woven of multiple and sometimes seemingly irreconcilable elements that can nevertheless work together to manifest an otherwise unrealizable creative potential. The emerging field of integral ecologies is a promising expression of this potential. It remains to be seen, of course, just how and to what extent, given the gravity of our times, this potential will be fulfilled.

NOTES

1. See Species Alliance (2009) and its major project to date: a full-length documentary, *The Call of Life: Facing the Mass Extinction*.

2. By *mind* here, I mean self-consciousness, particularly as enacted through symbolization. In the more general sense of interiority, as with Teilhard's (2008) idea of the *within* of things, *mind* is of course present from the beginning and all the way down.

3. See entry for "Biosphere" (2008) in the *New World Encyclopedia*.

4. To object to considering the Earth as a whole as alive seems as misplaced as denying that a tree is alive because only one percent of its mass consists of living cells (mostly as a thin layer just below the bark). Individual cells, for that matter, though indubitably alive, also consist primarily of apparently nonliving elements (such as cytoplasm or DNA). The emergent quality of life, in other words, is invisible to the merely quantitative or mechanistic gaze.

5. In recognition of the geological impact of the human, geologists are now proposing that we have passed out of the Holocene and into the *Anthropocene*. Erle Ellis (2011) says the following about the Anthropocene: "In the 16th century Nicolaus Copernicus moved the Earth from its privileged position at the centre of the universe. In the 18th James Hutton opened up depths of geological time that dwarf the narrow now. In the 19th Charles Darwin fitted humans onto a single twig of the evolving tree of life. As Simon Lewis, an ecologist at the University of Leeds, points out, embracing the Anthropocene as an idea means reversing this trend. It means treating humans not as insignificant observers of the natural world but as central to its workings, elemental in their force" (para. 4).

6. See, for example, some of the titles of papers in Volume 1 of *Current Trends in Ecology* (2006): "Flexible migration in diadromous fishes between freshwater and marine habitats, as revealed by otolith microchemistry," "Maternal attractant odour in newborn rat: Isolation and Bioassay," "Estimation of foliage characteristics of isolated trees with the Plant Canopy Analyzer LAI-2000."

7. And the same year, incidentally (1969–1970), that saw the emergence of the field of transpersonal psychology.

8. All of the translations of Morin in this paper are my own.

9. While it is arguably harder (some might say misguided) to make a case for an ecological reading of the mechanistic paradigm or global capitalism (which Berry focuses on in his critique, along with the Biblical traditions), an integral view of the evolution of consciousness could nevertheless see them as having played essential roles in the emergence of the Planetary era (see, in this connection, Kelly, 2010).

10. Corresponding to his distinction between *ground value* and *intrinsic value* above, Wilber has also characterized the relation between the biosphere and anthroposphere with the terms *fundamental* and *significant*, respectively (see Wilber, 1998).

11. The notion of a constructive postmodernism was first proposed by David Griffin (see Griffin, 1988).

12. Whereas, with pantheism, the cosmos as a whole (*pan*) is considered to be identical with the divine (*theism*), with panentheism (*pan*=all *en*=in *theism*=god,

but also god-in-all), the cosmos is conceived as suffused with the divine, which nevertheless both includes and transcends the cosmos.

13. Wilber's "postmetaphysical" turn is a step in this direction, as is Ferrer's participatory approach (which advocates a "dialectic of universalism and pluralism") (see Wilber 2006; Ferrer 2002; Kelly, 2008).

14. Wilber's alternative designation of the levels as "waves" and of the Great Chain of Being as a "Great Nest" is an indication of such a softening. As yet, however, there is no suggestion for an alternative for the notion of "quadrants."

15. Morin's paradigm of complexity and general ecology is also an example of the mental structure becoming more diaphanous through the integral mutation. Though less burdened by perspectival thinking than the AQAL approach, Morin's writings nevertheless retain much of the late-modern suspicion of spiritual transcendence (a suspicion shared to a lesser degree by Berry and Swimme), especially in the form of religious doctrines. The AQAL approach is much more accommodating in this respect, though there is the issue of its precommitment to a particular ranking of religious traditions.

16. An invaluable resource for those interested in pursuing the matter further is the ongoing work of two organizations: Religion and Nature (2014) (which is the gateway to information about the *Encyclopedia of Religion and Nature*, the International Society for the Study of Religion, Nature and Culture, and the *Journal for the Study of Religion, Nature and Culture*), and the Yale Forum on Religion and Ecology (n.d.).

17. I adopt this term from Gayatri Chakravorty Spivak. According to Katie Smith (n.d.), "Spivak argues that the popular conception of globalization as the financialization and computerization of the globe leads to a vicious system of exploitation, whereby it is assumed that the globe (as a kind of imaginary terrain that exists only on our computers) can and should be controlled to produce capitalist gains. Planetarity, on the other hand, is a more sensitive and attuned way of understanding the materiality of the world and our collective place and responsibility as humans within it. Spivak suggests that rather than being global agents we should instead imagine ourselves as planetary subjects, inhabiting a planet that is merely 'on loan' to us" (p. 2).

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