

The Trumpeter
Volume 19, Number 2 (2003)
ISSN: 0832-6193

The Living Earth and Its Ethical Priority

Stan Rowe

Stan Rowe is a retired ecology teacher, professor emeritus at the University of Saskatchewan, and is interested in Earth-human relationships and especially ecospheric ethics. Author of the book *Home Place* and of numerous essays published in *The Structurist*, he lives happily in the mountainous terrain of New Denver, British Columbia.

Abstract

“Living Earth” means that Earth is the carrier of the vitalizing essence or animating principle here capitalized as “Life” to differentiate it from “life” as traditionally associated with organic things alone. Planet Earth exhibits cyclic processes of organic construction known as “aliveness” and of inorganic/organic deconstruction named “deadness,” and the various states or phases of these closely integrated processes have developed within and dependently on Earth’s air-water-land ecosystems—named “geoecosystems” because they are place-specific. Thus Earth, the Ecosphere, and its sectoral geoecosystems—resembling mega-terrariums and mega-aquariums with all their organic/inorganic contents—have from the beginning of time been the evolutionary source and purveyors of Life. Metaphorical language has equated *life* only with organisms. Ecological knowledge, by revealing the importance of context, shows that Earth is synonymous with Life in its larger sense. When the miraculous quality Life is located in Earth and its geoecosystems, a realistic foundation is established for a new kind of extra-human ethics: Ecological Ethics or Ecospheric Ethics. Axiomatic is the belief that organisms, including humanity, are secondary in importance to the creative Earth and its geoecosystems.

Key Words: Life, Earth, Ecosphere, Ecosystems, Ecological Ethics, Ecospheric Ethics, Metaphorical Language.

Introduction

My thesis is that ecological understanding negates the traditional view of Earth as merely a “life-support system,” as no more than a passive ark serving to keep afloat its organic cargo, including humanity. The sun-warmed Ecosphere exhibits many evolved inorganic/organic processes that in endless cycles link its improbable air, water, rocks, sediments, and organisms. By integrating these diverse components, Earth shows itself to be a higher level of organization than organisms, just as organisms are a higher level than their organs, and as organs surpass in organization the tissues and cells they comprise.¹ So far as is known in the solar system and beyond, Earth, the Ecosphere, is the only celestial body that exhibits the closely related organic/inorganic cyclic processes that have been named “living” and “dying.” As such, Earth exceeds in creativity and importance all organisms, including the human species.

Ecology accents the importance of the Earth context, underlining the fact that humans and all other organisms are Earthlings: born on and from Earth, made of Earth’s surface dust (itself derived from ancient star-dust), evolved and sustained by its ecosystems of which they are dependent parts. These truths support the hypothesis that Earth and its ecosystems are the essential Life-giving *source* and not merely the *support* of organic life-forms. Conceiving the relationship of organism-to-Earth as that of part-to-Whole, inverts the traditional value system that identifies people as more important than their Earth context. The identification of Earth and its sectional ecosystems as possessing higher intrinsic value than its organic/inorganic components, elevates the status of the former as moral objects and points toward an ecological Ecospheric Ethic that transcends while including the human species.

Morality and ethical action involve choices, with fundamental values providing the standard. Comprehension of Earth as the generative source of Life and the carrier of Primary Values shifts ethical emphasis from people-centredness (homocentrism) to Earth-centredness (ecocentrism). Thus to protect and perpetuate the creativity of Earth’s ecosystems, ecocentric people will reject many of the traditional cultural norms and practices of homocentric society. They will replace the concept of the autonomous individual with the ecological individual, reclassify “progress” as whatever is conducive to sustainable participation in Earth’s ecosystems, and redirect science and technology to the same end. In action they will place limits on their population numbers, their consumption, and the wastes they produce. Situating the primary ethical standard outside the human race—asking: “Is it good

for Earth?”—will facilitate solution of such human dilemmas as global versus regional trade, appropriate technology, population numbers, and the control of births.

The latter topic raises the question of where the life-force is centred and most needs protection: in fused sex cells, in the human mother, in Mother Earth?”

What is life?

No scholar-philosopher has yet been able to adequately define “life,” and Wendell Berry’s “Life is a Miracle” (2000) may be as close to the truth as humans will ever get. The word “life” is a cover for human ignorance, a term for an ambience whose absence has been named “death.” Linked with organic “aliveness” are such functions and processes as metabolism, development, growth, reproduction, and evolution. In studying these biological phenomena, perceptive scientists acknowledge that they are not studying “life” *per se*. Ernst Mayr noted that attempts to define life are futile because “there is no special substance, object or force that can be identified with life,” and Lancelot Hogben protested that “biology is not the science of ‘life’ [because] science is not about the study of abstract nouns.”² If the vital non-thing called “life” is an abstract concept, inaccessible both to the literary scholar and to the scientist, what accounts for its unquestioned association only with organisms, as their special possession?

Morison (1971) provided one answer, referring to Whitehead’s “fallacy of misplaced concreteness” whereby an abstraction is mistakenly accepted as a thing. We observe an unusual set of objects that exhibit growth, production, and special ways of using energy, he wrote, and we elect to call them “living things” as a separate class from “dead things.” The next step is to invent a hypothetical entity possessed by all living things that accounts for their difference from nonliving things. We describe this attribute as “livingness” and then increase its substantiality by shortening it to “life.” By making “life” a short, snappy noun and thereby conferring thinghood on it, the way is eased toward believing that “life” is a kind of mobile agent that vitalizes organisms from within and whose departure marks their death. But “life” is not a thing, nor is it the possession of organisms in an otherwise dead world.

Ecological unawareness is a second answer to why “life” has only been associated with organisms. From ancient time to the present, humanist thinkers have rarely considered the Earth-context as of more than passing interest. The improbability and indispensability of the matrix that surrounds organisms was not known. Today the logic of ecology

suggests that “Life,” though undefinable except as an organizing potential, is a qualitative characteristic of Earth and its spatial segments named “ecosystems.”

What Is an Ecosystem?

Ecosystems are defined as inclusive, three-dimensional, geographic places. This accords with the definition proposed by a Committee of the Ecological Society of America. An ecosystem, said the Committee, is “a *spatially explicit unit of the Earth* that includes all the organisms, along with all components of the abiotic environment within its boundaries.”³ Earth or Ecosphere, the largest ecosystem, can be divided into sectoral landscape ecosystems and waterscape ecosystems at scales that suit human purposes. These “geoecosystems”—home to humans and all other organisms—are volumetric chunks of Earth-space that can be mapped, and studied structurally and functionally.⁴ They are real, place-specific entities, not abstract concepts as implied, for example, by the vague definition of ecosystem as “community-plus-environment.”

The geographic definition of ecosystem as geoecosystem draws attention to all Earth’s components: landform, soil, water, and air as well as organisms. Thus the importance of the functionally inseparable inorganic and organic is taken into account in cycles of “livingness” and “deadness.” The geoecosystem is neither centred on organisms *per se* nor centred on the air-soil-water matrix surrounding organisms, but rather on that portion of Earth wherein the organic and inorganic interact and are integrated.

The “geoecosystem” concept is especially important in a philosophical sense because it fills a vital gap between the concepts “Earth” and “organisms.” Each geoecosystem—continental, regional or local—is a complete sector of Earth containing inter-related inorganic and organic contents: air, water, land, organisms. Like giant terrariums or aquariums, each is participating in Earth’s functions and processes that are accompaniments of living and dying and living again, in eternal evolutionary cycles.

Arne Naess has written: “In the Deep Ecology Movement we are biocentric or ecocentric. For us it is the ecosphere, the whole planet, Gaia, that is the basic unit, and every living being has an intrinsic value.”⁵ Interpretation of this passage is assisted by the geoecosystem concept that bridges the scale change from “the whole planet, Gaia” to “every living being.” Geoecosystems, along with their Earth summation, provide a logical referent for the adjective “ecocentric,”

distinguishing it from “biocentric” whose referent has always been organisms.

Thinking Fundamentally

The British ecologist Tansley coined the word “ecosystem” and justified it in these words: “Though the organisms may claim our primary interest, when we are trying to think fundamentally we cannot separate them from their special environment with which they form one physical system.”⁶ As he noted, the ecological unity of organism/environment is not apparent without fundamental thought.

The logic of Tansley’s insight that any living organism and its immediate environment comprises a more realistic system than either one alone, leads to the conclusion that every chunk of Earth space—air over land/water with organisms sandwiched at or near the interface—carries the Life potential, expressed not only in its organisms but also in their unlikely matrix. The improbable composition of air, of water, of rocks, soils and sediments, shows them to be integral parts of the marvel of Life rather than “dead environment.” How is it that we have assigned the greater part of the Earth spaces where we live to the category “dead environment?”

Humans interpret the world around them primarily by the sense of sight, and sight is not tuned to reveal ecological relationships. Sight inside the atmosphere operates on the “figure-against-background” principle, picking out objects while ignoring their equally important contexts. Language follows sight, assigning names (nouns) to the sight-created fragments, falsely confirming their stand-alone existence. Sight leads people to believe that the organic can be disconnected from the inorganic, that living fish can be separated from water, living rooted plants separated from soil, living human bodies separated from air. “Thinking fundamentally” means thinking relationally, thinking ecologically. It means learning to perceive the world more truly than sight and language at first suggest.

Learning to perceive organisms as situated in the context of Earth places, as parts of geoecosystems, gives meaning to their origins, evolution, maintenance—to their “aliveness.” What it means to be human has roots in the geoecosystems within which people have lived and evolved. Upright posture, two-legged locomotion, bifocal vision, and only a few strategic patches of fur, point to an ancestry in warm African savannah-ecosystems. The savannah pattern is repeated nostalgically in green-carpeted homes with flora decorations, and in urban parks dotted with trees where people go for re-creation. More

recent human history, living in the geoecosystems of different continents and islands of Earth, has elicited the minor racial differences exhibited within the species *Homo sapiens sapiens*. Humans have been shaped by Earth's geoecosystems and the concept points to the high importance of geographic parts of Earth that contain organisms and are their "houses" (Gk. *oikos* = eco = house).

Terminology is clarified when the prefix "eco" is attached only to what "houses" organisms; that is, to the Ecosphere and its subsidiary geoecosystems at all scales from the continental and oceanic to the regional and local. "Ecocentrism" means a central focus on Earth's geoecosystems with all their inorganic/organic contents. In contrast, "biocentrism" focuses on the class "organisms," on biodiversity. From an ecological viewpoint, biocentric perceptions are abstract and non-functional because they omit the Earth matrix. Biocentrism takes for granted the possession of "life" by organisms only, which ecocentrism denies. Further, "biocentrism" slips easily into "homocentrism" (a less gendered term than "anthropocentrism"), because humans are taught to believe that they are by far the most important members of the "bios." Also dangerously unecological in emphasis, and still narrower than biocentrism and homocentrism, are "ethnocentrism," and "egocentrism."

Earth and Its Ecosystems: The Context that Gives Life

Before ecology taught the importance of context, organisms seemed to exist as things-in-themselves, and the mysterious qualitative essence "life" was attributed only to them. Still today, both in the languages of the arts and the sciences, the words "organism" and "life" are used interchangeably. For example, Edward O. Wilson's latest book is titled *The Future of Life* but, of course, he means the future of organisms, of biodiversity. Similarly the question asked by scientists, "Is there life on Mars?" really means, "Are there organisms like us, or like our cells or organelles, on Mars?" This equation of "life" with "organism" has been called The Biological Fallacy.⁷

Scientists occasionally search for evidences of "life" other than organisms. Perhaps there is life on Mars, they say, because the presence of water has been detected there, and experience on Earth shows that water is essential for the generation of organisms. Here the idea is implicit, though unrecognized, that water is an essential external/internal part (source) of "life." Extending this logic, Earth's lithosphere with its surface sediments, and Earth's atmosphere with its peculiar mix of reactive and inactive gases, are also the necessary context and generating environment of organisms. James Lovelock

made himself unpopular with space-explorers keen to jet off to Mars by correctly predicting no life on that planet because of its inactive atmosphere.⁸ Although all agree that animated organisms could not exist without air-water-sediments, the Earth's matrix that provides them has, in the modern world, been denied "life."

Early human cultures—similar to today's surviving vernacular cultures that are "primitive" only in the sense of being "the first"—attributed life to Mother Earth and her solid-liquid-gaseous components warmed by sunlight. The soil underfoot was perceived as giving birth at springtime, renewing a profusion of plants and animals. Humus gave rise to humans, and both words are from the same Sanskrit root. The soil produced new life when fertilized by rain and irrigation, and so liquid water is prominent as a life-giving substance in many ancient myths. Various sprites and nymphs represented the life of sacred springs, waterfalls, streams, and lakes. The unseen air was also animated and gave life through breathing, through re-spiration from whose root such words as "spirit," "psyche," "animated," and "animal" have been derived.

Ecology, the science of context, shows that the concept of organisms as being alive in a dead matrix of Earth's sediments, water, and air, is insupportable. A logical step is to attribute Life to the fundamental organic/inorganic geoecosystems that in sum the Earth comprises. Thus ancient wisdom is recovered.

Obstacles Presented by Language and Culture

After the Earth Day celebrations in 1970, optimism ran high that the rest of the century would usher in the Age of Ecology making central the health of this unique, cloud-girdled, blue-green Planet. Not so. A sharper public consciousness did emerge, with greater understanding of such environmental problems as acid rain, stratospheric ozone depletion, rising levels of carbon dioxide in the atmosphere, climate change, desertification, water pollution, extinction of plant and animal species, and so forth. But national political systems resisted and still resist addressing the obvious causes: burgeoning human populations, continued growth of economic systems by increasing their through-put of living and non-living materials, polluting technologies such as those based on the internal combustion engine, and the tremendous waste and destructiveness of warfare.⁹

Ecological warnings over the last four decades have had negligible political effects. They seem to have stirred only the emotions and activities of a minority of environmental Greens. Western civilization

continues on its self-destructive path, treating Earth as a dead stack of “natural resources” and “raw materials.” Ecological ignorance is rampant, partly because of the inertia of language and of cultural dogmas.

As to language, note for example the lowly status that the uncapitalized word “earth” communicates. All the other planets are capitalized—Mercury, Venus, Mars, Jupiter, etc.—but rarely the one on whose supportive surface, under a warming blanket of atmosphere, humans are born, live, and die. Uncapitalized “earth” is also a synonym for “dirt” and “soil”—another sign of the low esteem in which this planet is held. Contrasted with heaven, uncapitalized “earth” is a place of sin, suffering and woe. Again, while granting that science-fiction humanoids from Mars would aptly be named Martians, Earth-humans seldom refer to themselves as Earthlings. Such examples suggest that language has been designed to conceal the source and support of *Homo sapiens sapiens*. As earlier noted, language follows sight-that-separates. Every noun potentially subverts ecological wisdom.

Ingrained cultural dogmas further separate people from their life-giving context. The old idea that man-made “culture” has lifted humans to a plane higher than “Nature” makes of Earth a lower brutish adversary. In reality, culture and Nature are inextricably merged in human society. Culture is social learning founded on and evolved from survival in Earth’s ecosystems. Cultures that persist over long time periods are those that incorporate in their belief systems and rituals an ecological knowledge of and sensitivity to their particular land/water-organism environments. Misunderstanding of this point is ecological ignorance—especially dangerous when wedded, as today, with tremendous technologic power that can be used to destroy or reconstruct land and water ecosystems.

Earth = Life

In summary, two arguments are here made in favour of changing the current conception Organism = life to the more ancient conception that Mother Earth = Life. One is ecological and the other metaphorical.¹⁰

The ecological argument is that sight-from-within Earth’s surface layer has led the scientific Western race astray. Enveloped in a living system whose air-layer is transparent, people could not perceive the relatedness of everything, at least not until recently when satellite photos, sight-from-without, showed all parts of the Ecosphere—atmosphere, hydrosphere, lithosphere, biosphere—connected in a living planetary “cell.” The outer vision is supported by internal evidence.

Meteorologists attempting to model Earth's climate have found the task impossible without also taking into account the interactive oceans and continents, the marine and land vegetations.

Analogous to the outside/inside view of Earth is examination of a cell under a microscope, followed by an imaginary view from within. Looked at from the outside the cell is seen as a unit whose parts are the watery cytoplasm, the vacuoles, inclusions such as starch grains, the nucleus and various other organelles. Seeing the whole, the viewer accepts at once that all the constituents are related components of a living cell. Now suppose the viewer is reduced to micro-size and placed inside the same cell with a pair of binoculars. Looking out and around the observer will apparently see the same cell components but now as separate things. The slow flowing cytoplasm, the vacuoles and starch grains, will appear "dead" while the more active, dividing organelles will be identified as "alive." From the outside all the components participate in and express the life of the cell. From the inside only certain parts appear to be animated. Just so, people as deep-air animals on Earth's surface have misclassified most of what lies around them as "dead."

The metaphorical argument begins with the assertion that language is largely based on the facts of bodily existence on Earth.¹¹ The various things that are separated by sight—supported by the other senses of hearing, smelling, tasting, and touching—are named in relation to body-knowledge in the here-and-now as suggested by the numerous words that incorporate ("put in bodily form") ideas from the three-dimensional world: up and down, back and front, in and out, ahead and behind, over and under. Words of simple physical derivation are then used as metaphors for feelings, emotions, and other immaterial concepts. For example, a person's mental state may be described as "be-wildered" (literally, lost in the wilderness) or lacking "com-prehension" (literally, together grasping or catching on) or without "under-standing" (literally, standing under). By a similar process, body parts are often used as metaphors: brain for mind, heart for courage, sanguine (blood) for optimism. Our pre-ecological ancestors, way back in the twentieth century, confirmed "organism" as the material metaphor for "life."

To the question, "What better metaphor for 'life' is available?" the answer, in the light of present ecological knowledge, is "Earth." The latter is justified as "better" by recognition that the organizing quality responsible for the improbable atmosphere, lithosphere, hydrosphere, and biota, is expressed only on this Planet. The equation of Earth with Life points up the importance of air, water, soil and sediments—and not

just organisms—as the purveyors of Life. Earth is alive, lending its animation to all components.

An argument can be made for recognizing Earth's context—the Solar System, the Galaxy, the Universe—as a still more inclusive Life-metaphor. It is true that many of Earth's vital properties derive from its particular placement relative to the satellite Moon, to the other Planets, to the Sun, to the Galaxy. But the fact of Life for humans is here on Earth's surface, the home of all organisms so far as is known. Of all the planets only Earth displays the many inorganic/organic features of the mysterious quality that counters entropy: that is, “livingness.” To identify the locus of Life right here, in what surrounds us where we exist, is the most useful extension of the concept. At one stroke it expands the primary ethical emphasis, transferring it from humans to the Earth home, as Ecospheric Ethics.

Ecospheric Ethics

Many are first attracted to valuing Earth through their interests in the scenic wonders of their native country and in the marvellously fascinating plants and animals that inhabit its land and water geoecosystems. The thought of Nature's miraculous forms under attack is repellent. It seems obvious that sublime landscapes and wild creatures should be preserved for ethical and aesthetic reasons, beyond the crass ones of utility. The so-called Environmental Movement too is prompted in large part by Nature's beauty perceived as under threat. An in-born aesthetic sense encourages care for Earth and organisms other than our own species, prompting action on their behalf. The outcome of this wonder and appreciation of the non-human is something relatively new: viz. moral concern expressed as ethical actions that extend beyond the human race.

The first thought is the need for Endangered-Species Legislation, expressing a “Bio-Ethic” focused on plants and animals. But common sense and ecology show that organisms are not self-sufficient. Without the vital support of Earth's inorganic/organic matrix they simply would not be. In itself the slogan “Save Biodiversity” is unrealistic; something more is needed.

Aldo Leopold took the next step by proposing a “Land Ethic,” to protect soils, water, and organisms by making moral objects of the land that supports and shelters them. Think of the land as a community, he said, to which we belong rather than as a commodity that belongs to us. Utility to humanity was central in Leopold's thinking, but he was on the right track in recommending a high regard for the “land community”

and all its organisms. “It is inconceivable to me,” he wrote, “that an ethical relation to land can exist without love, respect, and admiration for land, and a high regard for its value,” adding, “I mean value in the philosophical sense.” Leopold recognized that the land community has its own intrinsic value.¹²

Still more inclusive is an ethic that embraces Earth (Ecospheric Ethic) and its geoecosystems (Ecosystem Ethic). Such an Ecological Ethic places highest value on Earth and its geographic places with all their contents: the matrix elements of land, water, and atmosphere, as well as their contained communities of organisms of which *Homo sapiens sapiens* is one. Geoecosystems are the fundamental “living units” on the face of the Earth—source, support, and home to humanity. To make Earth a moral object does not denigrate its organic and human contents. The latter, of undoubted importance, now are realistically placed in their correct ecological perspective. It follows that the greatest need today is Endangered Ecosystem Legislation, the logical legal expression of Ecological Ethics and the only guarantor of air-water-soil-biota protection.

Ethics by Inclusion

Ethical systems express human values, which is to say that only what is valued will be treated ethically, as moral objects. When only people matter, then ethical concerns are limited to the human race. Everything else is only valued if it serves humanity. As ecological awareness grows, things other-than-human are perceived as valuable, initially because of utility. With greater sensitivity and empathy, sentient organisms are recognized as valuable in and for themselves. Legislation may be passed to prevent cruelty to animals or to protect rare plants. Then, beyond organisms, affection and ethical concern may be extended to special places, to the landscapes of home remembered from childhood, or to majestic old-growth forests, to coral reefs with their dazzling tropical fish. This sequence illustrates “ethics by extension” as the individual’s moral sense grows from the egocentric to the homocentric to the biocentric to the ecocentric.

The weakness of ethics-by-extension is that its starting point—the person, family, society—gets most attention, while its outer reaches get the least. The ethical sense, extended beyond society to the nation and humanity as a whole, “plays out” before it reaches Earth’s non-human organic/inorganic realities. Just as light intensity varies as the square of the distance from its source, so the ethical impulse fades outward from its human-centred beginnings. This is clearly evident in the left-leaning political platforms of Social-Democratic political parties. Their

environmental concerns are no more than a greenwash on the two fundamental issues that absorb most of their ethical interests: liberty of the individual (egocentric) and a degree of communality (ethnocentric).

Given the importance of Earth and its health, a better approach is first to emphasize the intrinsic values of Earth's geoecosystems, and then turn to their valuable organic and inorganic contents. This suggests an ethics-by-inclusion that initially identifies the Life-source/support as the highest moral object. By this logic, Earth is most worthy of ethical concern, then its geoecosystems, then their organic/inorganic constituents of which humanity is one precious species. Such an inversion of traditional ethics is ecologically realistic. Further, it teaches the human race humility—a virtue so far in short supply. To the charge that placing Earth first violates the meaning of “ethics” as moral behaviour between sentient creatures, the answer is that ethical actions emanate from human values and the latter need not be limited to the homocentric and the biocentric. When Earth is highly appreciated, ethics will be ecocentric, home-centred, an Ecological Ethics.

Conclusion

This article sets the stage for further discussion of Ecocentric Ethics (Ecospheric Ethics, Ecosystem Ethics). The intention is not to spell out the implications of ethics centred on Earth and its geoecosystems rather than on people, beyond noting that such a transfer of values would immediately bring into question the prevalent philosophy of unlimited material growth in all its manifestations: economic, industrial, and reproductive. A standard for judging “the good” of human thoughts and actions would be established outside the race, and this could not but conduce to the health and sustainability of both non-human and human organizations.

Today, aided by satellite and aerial photography, we can more truly view the whole Earth and its sectoral geographic ecosystems as the locus of “Life.” This god's-eye-view, seeing the vital, animated wholes of which organisms are parts, is to my mind ecology's chief contribution to modern thought. It illuminates the most effective direction for conservation and preservation efforts.

The creative cradle of Life on Earth, the geoecosystem, continues to determine the birth, development, and death of all organic/inorganic forms on this planet, including *Homo sapiens sapiens*. This knowledge prompts a realistic perspective on our own living within Earth's regional ecosystems. And of our inevitable dying and recycling into other organic/inorganic forms, this happy thought from old Martin

Luther, who doubtless was unaware of its appropriateness for an Earth-based Ecological Ethics:

Media morte in vita sumus—"In the midst of death we are surrounded by life!"

References

Applewhite, E. J. 1991. *Paradise Mislaid: Birth, Death, and the Human Predicament of Being Biological*. New York: St. Martin's Press.

Berry, Wendell. 2000. *Life is a Miracle: An Essay Against Modern Superstition*. Washington, DC: Counterpoint.

Cairns, John Jr. 2000. World peace and global sustainability. *International Journal of Sustainable Development and World Ecology* 7: 3–11.

Christensen, N. L., A. M. Bartuska, J. H. Brown, C. Carpenter, C. D'Antonio, R. Francis, J. F. Franklin, J. A. MacMahon, R. F. Noss, D. J. Parsons, C. H. Peterson, M. G. Turner, and R. C. Woodmansee. 1996. The report of the Ecological Society of America Committee on the Scientific Basis for Ecosystem Management. *Ecol. Applications* 6: 665–691.

Lakoff, G., and M. Johnson. 1980. *Metaphors We Live By*. Chicago and London: University of Chicago Press.

Leopold, Aldo. 1949. *A Sand County Almanac*. New York: Oxford U. Press.

Lovelock, James. 1988. *The Ages of Gaia*. New York: W. W. Norton & Co.

Morison, R. S. 1971. Death: Process or Event? *Science* 173: 694–698.

Naess, Arne. 1990. The Basics of Deep Ecology. In *The Green Fuse, The Schumacher Lectures 1983-88*, edited by John Button. London and New York: Quartet Books.

Rowe, J. S. 1961. The level-of-integration concept and ecology. *Ecology* 42: 420–427.

Rowe, J. S. 1997. Defining the ecosystem. *Ecological Society of America Bulletin* 78: 95–97.

Rowe, J. S. 2001. What on Earth is Life? An Ecological View. *Ecosystem Health* 7(3): 1–6.

Rowe, J. S., B. V. Barnes. 1994. Geo-ecosystems and bio-ecosystems.
Ecological Society of America Bulletin 75: 4041.

Tansley, A. G. 1935. The use and abuse of vegetational concepts and terms.
Ecologist. 16: 284–307.

Acknowledgement

I thank Bruce Morito for his generous attention to this article in draft form and for his constructive comments on it.

Notes

¹ Rowe 1961

² Applewhite 1991

³ Christensen et al. 1996

⁴ Rowe and Barnes 1994; Rowe 1997

⁵ Naess 1990

⁶ Tansley 1935

⁷ Rowe 1992

⁸ Lovelock 1980

⁹ Cairns 2000

¹⁰ Rowe 2001

¹¹ Lakoff and Johnson 1980

¹² Leopold 1949