

THE MYTH OF COMMUNITY AS ORGANISM

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The traditions of natural philosophy, natural history, and one of their successors, ecology, converge on a concept of nature having the properties of an organism or, as it came to be called, a supra- or superorganism. This tradition was surveyed by Haraway, who traced it to Aristotle [1]. The extension of biological organicism to the social group, single species, or community was accomplished in the 19th century, and protoecologists and ecologists applied the metaphor of organism to the entire complex of organisms, the multispecies community, or even to organisms and environment, the ecosystem [2]. For example, Karl Semper characterized species as related "like the organs of a healthy living organism," while the pioneer ecologist-limnologist, Stephen A. Forbes, wrote: "A group or association of animals or plants is like a single organism" [3, 4]. Clements and Shelford described the organismic concept in ecology as "a veritable magna carta for future progress," and the major treatise on animal ecology of the first half of the 20th century stated: "The interspecific system has also evolved the characteristics of the organism and may thus be called an ecological supraorganism" [5, 6]. F.S. Bodenheimer declared that "every modern textbook of ecology stresses the highly integrated supraorganismic structure of communities," and he traced the notion's empirical sources in ecology and its epistemological sources in philosophy, notably Immanuel Kant and Bertrand Russell [7]. The dominance of the supraorganism concept of community in ecology was essentially uncontested before 1950, in spite of a few lonely voices opposing it—including Bodenheimer, who stated that whatever its merits as a heuristic device, there was no scientific evidence to support it.

The concept of the organismic community was most explicitly and effectively advanced in ecology by the plant ecologist Frederic Clements [8]. Clements described vegetation as composed of "climax" communities rec-

ognizable by characteristic dominant species, each occupying an extensive area of similar or identical climate: "Thus like other but simpler organisms, each climax has its own growth and development, . . . A formation arises, grows, matures, and finally dies. The formation, moreover is able to reproduce itself" [9]. Clements visualized the landscape of America as largely covered by stable, deterministic regions of climax vegetation until the advent of civilization in the form of European agriculture, which, he claimed, made recognition of distinct boundaries difficult.

Although some ecologists demurred, it was not until the 1920s that an alternative paradigm of community appeared, in the work of L.G. Ramensky in Russia and H.A. Gleason in the United States. Gleason's "individualistic concept"—which was ignored when it first appeared in 1917, attacked on its second appearance in 1926, doubted at its third appearance in 1939, and then largely ignored by ecologists—was specifically developed as an alternative to Clements' organismic concept of community [10]. Gleason's thought was based on three premises: (1) each species responded to the environment individually; (2) the environment varies continuously in time and space; and (3) dispersal of organisms from place to place is stochastic. Hence the community at any site was individualistic, differing from the community at other sites. The contrasting metaphors were "predictable," "integrated," "unit," and "organism" for Clements' idea, and "coincidence," "spectrum," "continuum," and "gradient" for Gleason's. These largely qualitative models remained as conceptual alternatives, with Clements' climax model in ascendance, until the 1950s, in spite of the doubts of some ecologists.

Michael Barbour wrote that "something profoundly important happened among American ecologists during the decade of the 1950s" [11]. What happened was that Gleason's "individualistic concept" was resurrected in ecology as an alternative to the traditional organismic concept of the community. The "fragmentation" Barbour noted beginning in the 1950s led to extended, even heated, discussion of the attributes of community [12–14]. Although some ecologists had not accepted Clementsian theory before 1950, because there was no alternative concept, hypothesis, or even paradigm, the discourse had been muted. Many discussions from the 1950s to the 1990s turned on the distinctions between a community as an organism or superorganism versus an individualistic community. These discussions were stimulated by extended quantitative studies of communities from diverse habitats—marine, freshwater, and terrestrial—and many taxonomic groups of animals and plants. The empirical evidence was the concurrence, or not, of species and their pattern of distribution in space, such as along a topographic gradient up a mountain slope, or along a gradient of an environmental variable such as dry to wet soils. According to the organismic tradition—or what came to be called the community unit theory—species should respond as integrated groups reaching their peak pop-

The author extends his appreciation to Dr. Clifford W. Gurney and Dr. David Lodge for helpful comments on early drafts of this essay.

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ulations at similar points on the gradient and having coincident boundaries. In the individualistic concept, species populations were represented as peaking separately along the gradient, and boundaries were similarly scattered. The interpretation of data became more problematical with the increasing use of quantitative measurements and the advent of multidimensional mathematical models. Nevertheless, the debate continued with the classical Clements/Gleason poles filled in with a variety of alternative models [15-17].

A corollary of the organismic concept of community was that the climax community responded as a unit to changes in climate. The classical interpretation was that the "zoned climaxes" retreated southward in front of advancing Pleistocene glaciers, returning north as the glaciers retreated and the climate ameliorated. Clements and Cheney described the southern border of the beech-maple climax retreating from the Ohio River to the Gulf of Mexico during maximum glacial stages [18]. Paleocological studies during the 1960s and 1970s, however, showed that species of a putative climax migrated separately to diverse places during the advances of Pleistocene glaciers and reassembled as different combinations in the areas freed from ice in the postglacial period [19]. This independent movement of species in response to climatic change was taken as support for the individualistic concept of plant and animal communities [20].

As might be expected, a superorganism is difficult to kill, and it has demonstrated its "resilience" in a number of ways [21]. The superorganism has even on occasion been revived [22]. The debate among ecologists about the community as organism persists to the present. What is unusual is that the dispute has been taken up by non-ecologists, among them historians, philosophers, and writers about the environment. This is not entirely surprising, because the metaphor of organism applied to nature is familiar in historical, philosophical, and literary discourses and is linked to other terms, such as *holism* and *emergence*, which are commonly associated with the organismic community in ecological discussions. However, even after the name *ecology* became widely familiar in diverse contexts with the widespread recognition of the environmental crisis in the 1970s, reference to substantive ecological scientific issues was rare. The purpose of this essay is to examine references to the organismic/individualistic debate among ecologists, especially Frederic Clements and H.A. Gleason, in the context of diverse non-biological disciplines. The interpretations of this long-term dispute about the ecological community turn on the powerful myth of nature as an organism.

The diversity of positions among ecologists should suggest caution to non-ecologists seeking justification from ecology. It is not that ecology has nothing to contribute to the interests of historians, philosophers, theologians, and environmental thinkers, but the various positions among ecologists must be considered. Ecology is a scientific way of examining the attri-

butes of nature defined by the presence and activities of living organisms in all their complexity. Recognition of this complexity has led ecologists into the depths of the mathematical theories of information, systems, chaos, catastrophe, and complexity, which have been explored in an effort to address the difficulties with which ecologists have struggled for decades. It is flattering to the ecologist's ego that ecology has been seized on as a source of enlightenment by writers in a variety of fields. However, it has been rather a selective process. The myriad terms using the prefix *eco-* or the adjective *ecological* commonly bear little relation to the science of ecology, and the interpretations do not necessarily follow from the evidence of ecology [23].

The first historian to refer to ecology, James A. Malin, identified three groups of ecologists: a Clementsian organismic group, the explicitly opposed Gleasonian individualistic group, and an intermediate group [24]. Malin cited Gleason and considered his individualistic concept in detail at a time when texts and references in ecology largely ignored him. Malin's analysis of these contrasting views appears, significantly, not in the two chapters he entitled "Ecology," but in a later chapter on "Science and Social Theory." Malin vigorously attacked Frederic Clements' role as consultant to the U.S. Department of Agriculture during the 1930s drought and the social consequences of his ideas for management of the American grassland, based on his organismic theory of climax community. Clements envisioned the development of the American grasslands in terms of his theory of the climax community, which established the proper ecological system for the development of the Great Plains. He enunciated the traditional litany of organismic ecology: "Within such a huge organism, the whole is much greater than the mere sum of its parts and hence the need for coordination and correlation far transcends all other considerations whatsoever" [18].

In Malin's view, the Clementsian "climax as a general condition, extending with any degree of uniformity over a large area, is quite out of line with reality"; Clements' concept of vegetation as organism leading to climax carried, Malin said, "something of teleology" [24]. Swieringa quoted Malin contra Clements: "it is essential to avoid . . . any form of geographical determinism, of holism or gestalt dicta about the whole being greater than the sum of its parts" [25]. Malin was explicitly pro-Gleason, writing that species were individualistic in their response to the physical environment and other species and that "Under no circumstances did an association migrate or reproduce as a unit" [24]. Such "down-to-earth realism" excluded completely any idea of vegetation units as organism" [24]. Malin distrusted the organismic concept as "collectivistic" and lending "support to the authoritarian state" [24]. Gleason's individualistic concept was more in keeping with his own ideas about the role of the individual agriculturalist in developing the grasslands contra Clements' intimations of government

planning. Malin essentially echoed Gleason: "Each and every place and time is unique and change is continuous, irreversible, and indeterminate" [24]. Thus the first entry of a historian into an ecological dispute produced a clear rejection of the organismic concept of community, widely held by ecologists-at-large—specifically of its extreme form as advanced by Clements—and endorsed H.A. Gleason's individualistic concept.

Three decades later another historian, Donald Worster, addressed these issues in *Nature's Economy: A History of Ecological Ideas* [26]. Worster's chapter "O Pioneers: Ecology on the Frontier" turned to Clements and the organismic community that developed through a series of stages—from a sere to a stable end point, the climax—like the development of a complex organism. The issue in the drought years of 1930s was no longer a purely academic or scientific one, because grassland ecologists, notably Clements and others of the University of Nebraska school, were serving as advisors to, or were employees of, federal land use agencies. Worster wrote that American policy makers in Franklin Roosevelt's Department of Agriculture relied heavily on Clements' climax theory as a basis for a broad regional plan for land management in the grasslands. Such a policy would leave the putative climax as undisturbed as possible and constrain the expansion of grassland agriculture.

Worster dates historian James Malin's protest to 1956, although Malin had defended the sod-busters' plow against Clements' climax theories in 1947 [24]. According to Worster, Malin believed that the call to respond to ecological laws was a surrender to determinism. Worster described Malin as "a crusty, unreconstructed Social Darwinist who wanted from nature a justification for free enterprise and economic individualism" [27]. Malin counted on man's machines and technology to resolve the problems created by the grassland environment. It seems anomalous that the first historian to effectively consider ecology as a basis for understanding the human use of nature should repudiate the organismic ideas of one of its founders, but Malin was eventually followed by a large proportion of ecologists in accepting Gleason's concept [11, 15, 16].

Worster had recorded the diverse approaches to ecology but found that the "Age of Ecology" had not much new to say about the organization of nature [26]. He continued to hear "now and then" the "nicely contrived balance-of-nature" and "organicism." These echoes persisted and, in a new edition of his book, Worster rewrote, and substantially expanded, his final section, "The Age of Ecology" [26]. In it he reviewed the continuation of the organismic tradition in the systems ecology of Eugene Odum, a successor to Frederic Clements. Systems ecology adopted the philosophy of Ludwig Bertalanffy and was promoted in the work of Eugene and Howard Odum and others as the basis of a new holistic theory for ecology. It gained wide visibility and funding in an International Biological Program that developed in the 1960s [28]. Systems ecology substituted the flows of energy

and materials for the traditional emphasis on species composition but, as Worster noted, it continued the organismic tradition in its elaborate mathematical models.

A revolt from theoretical constructs of the organismic, ecological community appeared in the 1970s, in a new generation of animal ecologists who failed to see the organismic order in nature and appealed to the individualistic concept of Gleason [29]. Contrary to the emphasis in organismic concept on balance, stability, and equilibrium, these ecologists turned to disturbance as the key to community development. Worster, however, found reaffirmation of balance of nature and steady state in the work of Herbert Bormann and Eugene Likens. Bormann and Likens were principally concerned with measurements of fluxes of nutrients, rather than the changes in species composition that are the crux of the debate concerning the Clementsian-organismic versus Gleasonian-individualistic community [30]. Worster's preference is evident, in that he states that this work supports the theory of a steady state rather than "the Gleason-Davis picture of utter anarchy," a somewhat politically loaded description bearing no relation to what Gleason claimed. The implication of anarchy, of lack of any order, is a common misrepresentation of Gleason's individualistic concept, which some have erroneously said is a random assemblage of species lacking any relations among the species. Neither Gleason nor any of his successors ever said that. Not *all* things are possible in an individualistic community—only some. The resulting pattern is more elusive than in a purported organismic community, but it is certainly not anarchy or random.

The most outspoken critic of balance-of-nature and organismic concepts was, according to Worster, the ecologist Daniel Simberloff, who undertook a philosophical analysis of the organismic-individualistic controversy and came down on the side of "probabilism" (Gleason) as against "essentialism" (Clements) [29]. Worster leaves the reader with "The Disorder of History," in which he notes the persistence in ecology of the balance-of-nature idea and of holistic organicism [26]. It is certainly true that they persist, but neither is clearly demonstrated by substantial evidence or consensus among ecologists in 1997 any more than in 1957, when F.S. Bodenheimer noted the ubiquity of these ideals in the absence of empirical evidence.

Historian Ronald Tobey studied the life cycle of the founding school of American plant ecology, which was that of Frederic Clements at the University of Nebraska, the center of the grasslands ecology. Tobey reviewed Clements' organismic concept of the plant formation, commenting: "For Clements the formation was ontologically as real an organism as the individual plant or animal" [31]. He identified the sources of Clements' organismic thought in the writings of Herbert Spencer and a pioneer sociologist, Lester F. Ward, and thought it was a product of Clements' neo-Lamarckianism. The most vigorous attack on Clements organismic ideas, Tobey wrote, was

by Gleason, who denied the ontological status of Clements' organismic community. Tobey dismissed Gleason's argument because, he said, it was philosophically untenable in the view of 19th-century idealistic philosophers. It is not clear how 19th-century philosophers of other persuasions viewed it. Tobey blurs the distinction ecologists have uniformly seen between Clements and Gleason in asserting that Clements recognized both "continuity of change" and "naturally limited organic boundaries." Oddly, Tobey interprets as an indication of Clements' idea of continuity the following: "However faint their limits, real stages do exist as a consequence of the fact that each dominant or group of dominants holds its place and gives character to the habitat and community, until effectively replaced by the next dominant" [31].

The distinction, as Gleason and his successors made clear, was that Clements saw communities rising and falling as aggregates of species or successional stages. Gleason's species rose and fell individually in response to the changes of physical environment and activities of other organisms. Tobey's so-called "continuum" bore no relation to Gleason's individualistic species changes, or to the continuum concept of John Curtis, or to the gradient concept of Robert Whittaker that succeeded the individualistic concept in the 1950s [11]. As Michael Barbour noted, this was a change recognized by most plant ecologists active at the time, and the distinction is clear to present-day plant and animal ecologists [11]. Tobey also noted the replacement of Clementsian theory by Gleasonian ideas in the 1950s.

The philosopher Holmes Rolston III made a fundamental philosophical distinction between the complex organism of Frederic Clements and the individualistic community of H.A. Gleason [32]. He noted that Clements' superorganism, if correct, could be granted ethical respect, because ethicists have commonly allowed respect for organisms, but no ethical obligations would be needed for a fortuitous juxtaposition. Oddly, Rolston asserted that most ecologists believe that an ecosystem is a real natural unit, citing Esa Saarinen's *Conceptual Issues in Ecology* [33]. That volume was instigated by Dan Simberloff's article that came down strongly on the side of Gleason and the philosophy that Simberloff believed supported Gleason [29]. Although Rolston backs off the claim that communities are organisms and notes, as did early ecologists, that ecosystems have no genome or unified program, he boldly picks up the assertion of only a few ecologists that ecosystems evolve.

Rolston acknowledged "stochastic processes" and the parts of communities as transients recorded by Charles Elton decades earlier, when he wrote of the familiar clockwork metaphor of community that the component gears sometimes moved from one clock to another. But Rolston also commented that a "lack of centeredness or sharp edges does not mean a lack of relational complexity" [32]. Much discussion among ecologists about communities turned on the coincidence of centers of ranges of distribu-

tion, or of patterns of local distribution and of margins or boundaries. The traditional organismic concept of coincident centers of distribution and common boundaries predicates a regularity of relationships much favored by mathematical modelers, whereas the continually shifting probabilistic combinations predicted by Gleason's individualistic concept and its intellectual successors, as described by Barbour, increases relational complexity and is the bane of modelers and easy theories [11]. The stochasticity inherent in Gleason's conceptualization should not preclude consideration of a Gleasonian community from ethical consideration, simply because some traditional philosophers had a limited concept of an ecological organism and a bias for the organismic metaphor.

Rolston acknowledges "critical help" from another philosopher, Andrew Brennan, who boldly addresses "Ecology: What It Is and What It Isn't" [34]. Brennan distinguishes two ecologies: one straightforward scientific studies, the other is a more encompassing "metaphysical ecology" [emphasis Brennan's]. Brennan addresses the issue with which we are concerned—Clements' organismic community vs. Gleason's individualistic community—and divides ecologists into two groups, those who believe in succession and those who do not. It would be very difficult to find an ecologist who would deny succession, although some may prefer more up-to-date terminology such as development or trajectory. The real dichotomy is between those who accept a *particular* theory of succession, especially Clements' organismic theory of succession to a stable climax, and those who do not.

Brennan takes the traditional Clements/Gleason disagreement as typifying subsequent discussions of ecosystems. Unfortunately, Brennan loads the argument by falling into the error committed by all too many ecologists. He contrasts the Clementsian based ecosystem as complex units within which living beings are nested with "merely chance" aggregations. It is doubtful until the arrival of the null hypothesis model of random aggregations in recent decades that any ecologist envisioned a community as a merely chance aggregation of organisms and environment lacking discernible pattern. Gleason and his successors recognized patterns of gradual change of species composition in space and time, in contrast with the putative patterns of abrupt change of integrated groups of organisms.

A literary scholar-cum-philosopher, David Oates, wrote *Earth Rising: Ecological Belief in an Age of Science* to provide a world view originating in ecology [35]. Unlike some earlier writers, Oates carefully distinguishes his world view from scientific ecology as "ecologism." In his reading, "Ecology speaks of a natural world of deeply *humane* [emphasis his] characteristics," among them cooperation, interconnectedness, and mutual aid. In this scheme, human relations, ethics, morality, aesthetics, philosophy, and even theology have "been recast in ecological form." These are bold claims, and Oates' assessment of "ecology" and "ecological form" requires scrutiny.

Ecological concepts and "ecological prophets" are the basis of Oates' ecologism which, he wrote, replaces "a bloody, ruthless idea of nature"—the Darwinistic view—by an idea that nature is "serene, beautiful and hospitable to life." The ecological idea that Oates adopts is the superorganism, drawing on Aldo Leopold and Frederic Clements. Clements' climax concept, according to Oates, "declares the goodness, the beauty, and above all the *oneness* [emphasis his] of nature." Oates envisions a "super-super organism" of the planet Earth and adopts the holism of some ecologists and philosophers as leading "through science to religious, ethical, moral, and imaginative participation in nature" [35].

Oates briefly notes a "countermovement" to organismic holism which he sees in the "individualistic" interpretation of H.A. Gleason. Unfortunately, Oates ties the individualistic concept to the 1970s mathematical model approach of Robert May and others, with which it has no connection. It is perhaps unfair to charge Oates with missing a large span of the contentious disputes among ecologists concerning communities from the 1950s to the present. However, the failings of the extremes of mathematical models should not be equated with the individualistic concept of Gleason and its successors in continuum and gradient approaches to ecological communities. Oates designates Clements' superorganism as "The Major Myth" of ecology. Oates uses myth not in the sense of a falsehood, but as an image or story "with a power, beyond the rational and limited impact of the literal." It is this usage that separates ecology from Oates' ecologism and makes the translation of ecological concepts into the larger scope of human endeavor a slippery business. It elevates the superorganism into another form of thought about nature that has as much connection with an earlier tradition sometimes called Providential ecology, which saw nature as a reflection of the Divine, as it does with ecological science.

The problems arising from the all-too-casual borrowing of the prefix *eco-* or the descriptor *ecological* are evident in contrasting Oates' use of *ecologism* with the use of *ecology* by a historian, A. Bramwell [36]. Oates carefully distinguished ecologism as a world view originating in scientific ecology but not coincident with it. Bramwell confounds the issue by asserting that ecologism rises from the concept of *Oecologie* (using an early spelling) and proceeds to use the words interchangeably. She writes: "Ecologists themselves are divided about when ecologism began." *Ecologism*, in fact, never entered the ecological lexicon until non-ecologists, such as Oates and Bramwell, introduced it into the murky penumbra of quasi-ecological terminology, and scientific ecologists were simply mystified by it. Oates' ecologism is a myth of a benign view of nature as serene, beautiful, and good, exemplifying its oneness. Bramwell refers ominously to "German ecologism" anticipating what she later calls "the German disease"—Nazism. According to Bramwell, "National Socialism and Fascist parties attracted ecologists." She asserted that acquaintance with scientific ideas, presumably of

ecology, "is an essential part of ecologism." In contrast to the benign myth of Oates' ecologism, Bramwell's ecologism rose from the "apocalypse" of World War I. She provides a series of attributes of ecology and ecologists, not distinguishing these from ecologism, but generally associating them with rather unsavory events. She summarizes the characteristics of ecologists ambiguously, if not unintelligibly: "So putting one's individual judgment ahead of party allegiance even of the most fanatical kind, is another hallmark of the ecologist. As well as being saved, he is a Protestant. As marginalized escapees from Lutheranism, that is not surprising" [36]. It is surprising to an ordinary professional ecologist that the name of the science should be taken so in vain and confounded with something called ecologism which comes in entirely different Janus-like disguises.

Another ecological world view is offered by Edward Goldsmith, the editor of a British journal *The Ecologist*, in a volume expansively entitled *The Way* [37]. Goldsmith reaches into the literature of ecology and pulls out numerous plums related to the general themes of holism and superorganism. He notes, for example, F.S. Bodenheimer's 1957 assertions about the ubiquity of the organismic community in early ecology, without citing Bodenheimer's comment that there was no evidence for it. He damns the reductionist, mechanistic ecology he attributes to the British ecologist Arthur Tansley and the American ecologist H.A. Gleason. Oddly, Tansley was the coiner and first expositor of the term *ecosystem*, which is the largest of ecological wholes and which, in some usages, has come for some to be the paradigm of holistic ecology. Goldsmith describes the resurrection of Gleason's maligned and ignored individualistic concept by J.T. Curtis and R.H. Whittaker in the 1950s, and asserts that Curtis, Whittaker and, by implication, Gleason believe that the "biosphere is atomistic and random." He belabors the false analogy of the individualistic concept that ecological organizations behave like billiard balls, which none but a limited population of mathematical modelers, enamored of the logistic equation, ever suggested.

Goldsmith relates how, for the natural theology of the 17th and 18th centuries, the "balance of nature" provided evidence of God's wisdom. Early ecology adapted the balance of nature and the superorganismic community on substantially different Darwinian grounds without theological overtones. It is the older traditions of ecology that are the favorite sources for regenerating dated world views ostensibly based on scientific ecology. In almost every instance when historians, environmentalists, philosophers, or theologians turn to ecology for insight, they find inspiration in the organismic views of Clements and others and denigrate the individualistic positions of Gleason. Interestingly, Goldsmith links what he terms the "anti-ecological ideas of Gleason, Tansley and Malin" that, he said, have come to be regarded as the ecological orthodoxy.

The traditional and resilient organismic concept of the ecological community finds general acceptance among scholars of various disciplines who

dip into the ecological literature and, with one exception, endorse the organismic or superorganismic concept of Clements, although that concept is largely dismissed by ecologists. It may be that the organismic concept is in the air with the widespread recent interest in J.E. Lovelock's Gaea hypothesis. The organismic implications of Gaea are evident, as physiology is attributed to planet earth and a meeting is titled "Gaea in Oxford II: The evolution of the superorganism" [38]. Gaea is the ultimate superorganism—although given recent speculations in cosmology, there may be more to come.

It may be that the superorganism is not a concept subject to scientific analysis but, in Oates' phrase, is the "Major Myth" of ecology, "with a power beyond the rational and limited impact of the literal" [35]. The preference for the organismic turns largely on the presumed sociological and philosophical consequences of the myth. Tobey asserted that the alternative of an individualistic concept was untenable in the view of 19th-century philosophy [31]. Rolston noted that a Clementsian superorganism deserved ethical respect, whereas an individualistic community did not [32]. Oates held that an organismic holistic view of ecology leads to ethical, moral and religious aspects of nature [35]. Worster, rhetorically, posed the distinction between organismic Order and individualistic Chaos [27].

Not all philosophers hold such views of nature. Crosby, reviewing the thought of William James, allows that "diversity and particularity are goods and that they are to be cherished along with integration and unity" [39]. In contrast to mechanistic deterministic models of the world there is "a certain amount of loose play." In this reading "chance and novelty are fundamental aspects of nature as much as stability and balance" [39]. It may be that 20th-century philosophers look more kindly upon the role of chance and an individualistic aspect of nature than did 19th-century philosophers. For example, C.S. Peirce has allowed a substantial place for chance in moving things from homogeneity to heterogeneity [40]. It is not obvious that the common preference among historians, philosophers, and environmentalists is warranted by any consensus among philosophers.

A metaphor is a powerful but sometimes dangerous way of indicating a relationship between different things. The metaphor of a group of species, a community, or of a group of species and their environment—an ecosystem—as an organism taken too literally is unsupportable on the evidence of recent ecology. The metaphor of community as a superorganism, because there are no clear ideas about what a superorganism might be, has no merit. Oates wrote that the "Major Myth," based on Clement's superorganism, "incapsulates some primal truth about the world" and "summarizes the fundamental truth of ecology," which he says is a scientific fact, undisputed by either side of the debate [35]. In fact, the integrated, interdependent nature of the ecological community in any Clementsian sense is what the debate is all about. It may be that the organismic community

or superorganism is important as "the major myth of ecology," but it gains limited support from ecology.

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