

## AESTHETIC IMPLICATIONS OF THE NEW PARADIGM IN ECOLOGY

Jason Simus, University of North Texas

“Ecological science has wrought a change in the mental eye.” –Aldo Leopold<sup>1</sup>

The new paradigm in ecology emphasizes dynamic change, disturbance, and non-equilibrium in natural systems.<sup>2</sup> This new paradigm presents some challenges for contemporary environmental aesthetics, one of which has to do with the cognitive thesis in environmental aesthetics. The cognitive thesis is that appropriate aesthetic appreciation of nature must be informed by scientific knowledge.<sup>3</sup> If the cognitive thesis is correct, and the new paradigm in ecological science tells us that nature is constantly changing, then aesthetic appreciation must adapt to constant change in natural systems. Another challenge the new paradigm presents has some bearing on the positive aesthetic thesis—that pristine nature has only positive aesthetic qualities such as balance, order, and harmony. The new paradigm’s emphasis on random and fluctuating disturbances may require us to rethink what we mean by “pristine” nature and the “positive” aesthetic qualities to which it is associated, such as balance, order, and harmony.

The purpose of this paper is to explore the aesthetic implications of this new paradigm, the central being that the cognitive thesis, when combined with the new

---

<sup>1</sup> Aldo Leopold, *A Sand County Almanac and Sketches Here and There* (New York: Oxford University Press, 1949), pp. 173-4.

<sup>2</sup> See Pickett, S. T. A., V. T. Parker, and P. L. Fielder, “The New Paradigm in Ecology: Implications for Conservation Biology Above the Species Level,” in *Conservation Biology: The Theory and Practice of Nature Conservation, Preservation, and Management* (New York: Chapman and Hall, 1992): 261-278; and Daniel Botkin, *Discordant Harmonies: A New Ecology for the Twenty-first Century* (New York: Oxford University Press, 1990).

<sup>3</sup> See Allen Carlson, “Appreciation and the Natural Environment,” *The Journal of Aesthetics and Art Criticism* 37 (1979): 267-276; “Nature, Aesthetic Judgment, and Objectivity,” *The Journal of Aesthetics and Art Criticism* 40 (1981): 15-27; “Nature and Positive Aesthetics,” *Environmental Ethics* 6 (1984): 5-34; all three articles reprinted in *Aesthetics and the Environment: The Appreciation of Nature, Art, and Architecture* (New York: Routledge, 2000). All page references refer to this book unless otherwise specified.

paradigm in ecology, may create problems for positive aesthetics. After reviewing Allen Carlson's defense of both the cognitive thesis and the positive aesthetics thesis, and some of the literature representing the new paradigm in ecology, I show how the significantly different conceptual framework that the new paradigm in ecology provides will require equally significant adjustments to how we aesthetically appreciate nature. I make two recommendations. First, aesthetic appreciation should be directed toward natural processes, not only natural objects. Second, aesthetic qualities such as imbalance, disorder, and disharmony should be considered positive aesthetic qualities. Collectively, these two suggestions imply that beauty in nature can be as chaotic as it is orderly.

#### THE COGNITIVE THESIS AND THE NEW PARADIGM.

Allen Carlson maintains that correct or appropriate aesthetic appreciation of natural environments must be informed by scientific knowledge.<sup>4</sup> Defends this view, what I will hereafter refer to as the "cognitive thesis," by arguing that without the requisite scientific knowledge provided by sciences like geology, biology, and ecology, we simply do not know what or how to appreciate nature as it is and with the aesthetic qualities it has.<sup>5</sup> Drawing on Kendall Walton's "Categories of Art," Carlson claims that nature should be appreciated in its correct categories, the categories disclosed by the natural sciences.<sup>6</sup> Moreover, appreciating nature within its correct categories yields aesthetic judgments that are objectively *true*.<sup>7</sup> Scientific knowledge, in other words, begins to answer the

---

<sup>4</sup> Carlson, "Nature, Aesthetic Judgment, and Objectivity," pp. 54-68.

<sup>5</sup> Carlson, "Appreciation and the Natural Environment," p. 51.

<sup>6</sup> Kendall Walton, "Categories of Art," *Philosophical Review* (1970): 334-67.

<sup>7</sup> *Ibid.*

basic questions of what and how to aesthetically appreciate the natural world.<sup>8</sup> Otherwise, the complexity of nature may lead to what William James has called a “blooming, buzzing, confusion.”<sup>9</sup> To make sense of nature’s complexity, we need science to inform our aesthetic judgments, not only to provide accurate descriptions of nature and its processes, but also to deepen and further our appreciation for the natural world. Carlson defines the cognitive thesis as

that appreciation of an object that reveals what aesthetic qualities and value it has...Scientific knowledge is essential for appropriate aesthetic appreciation of nature; without it we do not know how to appreciate it appropriately and are likely to miss its aesthetic qualities and value. Thus, if this account is correct, it explains the ability of science to both promote and enhance aesthetic appreciation of the natural world.<sup>10</sup>

For the purposes of this paper, I take the cognitive thesis to be generally correct. Carlson rightly insists that appropriate aesthetic appreciation must be informed by scientific knowledge. Otherwise, we simply do not know what or how to appreciate nature on its own terms.<sup>11</sup> The question is what kind of adjustments to aesthetic appreciation need to be made in light of the new paradigm in ecology, according to the cognitive thesis.

---

<sup>8</sup> Carlson, “Appreciation and the Natural Environment,” p. 51.

<sup>9</sup> William James, *The Principles of Psychology* [1890] (Cambridge: Harvard University Press, 1983), p. 462.

<sup>10</sup> Carlson, “Nature and Positive Aesthetics,” p. 93.

<sup>11</sup> See Yuriko Saito, “Appreciating Nature on its own Terms,” *Environmental Ethics* 20 (1998): 135-149.

Ecology as a self-conscious science has a rich conceptual history, despite its being labeled “immature” compared to the so-called “hard” sciences of physics and chemistry. Tracing the conceptual history of ecology in any detail is far beyond the scope of this paper, so instead I look to some seminal figures in the field to provide some historical background leading up to the new paradigm. But before engaging in the historical roots of the new paradigm in a scientific context, I first want to trace some of the more philosophical and ancient foundations of the new paradigm’s central ideas. In terms of science, the new paradigm separates itself from the old by emphasizing change, dynamism, and disequilibrium in ecosystems.<sup>12</sup> In laymen’s terms, the idea associated with the new paradigm is the “flux of nature,” as opposed to the “balance of nature” idea. While the former idea perceives and understands the natural world as a scene of constant change, the latter sees nature as stable.

The philosophical roots of these two competing ideas date back to the presocratics, particularly Heraclitus and Parmenides. Where Heraclitus proclaimed “All is flux,” Parmenides held that change is illusory.<sup>13</sup> Debate over the polarities of chaos and order, however, is not restricted to ancient philosophy—these polarities continue, quite pervasively, to influence our perceptions of nature. Under a Parmenidean influence perhaps, the “balance of nature” idea characterizes nature as orderly, stable, and predictable, which has consequences for both our moral and aesthetic relationship to the natural world. Under the balance of nature idea, “nature knows best” which suggests a

---

<sup>12</sup> See Pickett, S. T. A., V. T. Parker, and P. L. Fielder, “The New Paradigm in Ecology: Implications for Conservation Biology Above the Species Level,” in *Conservation Biology: The Theory and Practice of Nature Conservation, Preservation, and Management* (New York: Chapman and Hall, 1992): 261-278; and Daniel Botkin, *Discordant Harmonies: A New Ecology for the Twenty-first Century* (New York: Oxford University Press, 1990).

<sup>13</sup> See Jonathan Barnes, *The Presocratic Philosophers* (Boston: Routledge and Paul, 1979).

“hands off” approach to environmental protection. Aesthetically, changes and fluctuations in the environment, under this view, are anomalous and environments will ultimately heal and aright themselves back into delicate equilibrium and benign stasis. Alternately, under the Heraclitean, “flux of nature” idea, the natural world is chaotic, unstable, and random, which seems to render the natural world confusing at best and unintelligible at worst. Morally speaking, such a worldview leaves us with little understanding about what to do in terms of environmental ethics and policy-making. Aesthetically, the challenge is appropriately appreciating, or even identifying aesthetic qualities, under the “flux of nature” idea. However, if one of the central objectives of ecology is to accurately describe the natural world and its processes, then there is some hope.

Now that we are familiar with some of the basic philosophical concepts grounding our perceptions of nature, I now turn to the conceptual history of ecology as a self-conscious science, paying particular attention to some central figures that have contributed to the development of the new paradigm. In 1936, American ecologist Frederick Clements published “Nature and Structure of the Climax,”<sup>14</sup> in which he argued that species succession is unidirectional and comes to a stable point of equilibrium known as the “climax community.”<sup>15</sup> Clements’ climax community concept exemplifies what I will call the “old paradigm.” All ecological roads, according to Clements, lead to the climax community, and any seemingly random disturbances to it are explained as temporary stages.

---

<sup>14</sup> Frederick Clements, “The Nature and Structure of the Climax,” *The Journal of Ecology* 24 (1936): 252-84.

<sup>15</sup> *Ibid.*

In partial reaction to Clements' climax community concept, Arthur Tansley coined the term "ecosystem," to explain what he saw as dynamic change in natural environments.<sup>16</sup> To Tansley, the structure and function of natural environments was systemic, and ecosystems stood in a state of what he called "dynamic equilibrium."<sup>17</sup> Thus moving from the climax community to dynamic equilibrium, the ecosystem concept accounted for dynamism in natural systems, albeit dynamism that maintained overall equilibrium. Later in the 1960s, Eugene Odum emphasized the systemic nature of nature by modeling the flow of energy through natural environments, complete with elaborate diagrams depicting inputs and outputs.<sup>18</sup> Odum's contribution significantly expanded the focus of study in ecology beyond the species level, a central aspect of the new paradigm. But before we delve into the details of the new paradigm, I want to make some historical qualifications.

First, the new paradigm is only "new" in terms of advancements in ecological science, particularly modeling techniques used in research. Before these techniques became acceptably accurate in defending their respective hypotheses, naturalist Aldo Leopold discussed how the balance of nature idea influenced natural science when he wrote:

To the ecological mind, balance of nature has merits and also defects. Its merits are that it conceives of a collective total, that it imputes some utility to all species, and that implies oscillations when balance is disturbed. Its defects are that there is only one point at which balance occurs, and that balance is normally static.<sup>19</sup>

---

<sup>16</sup> Arthur Tansley, "The Use and Abuse of Vegetational Concepts and Terms," *Ecology* 16 (1935): 284-307.

<sup>17</sup> *Ibid.*

<sup>18</sup> Eugene Odum, *Fundamental of Ecology* (Philadelphia: Saunders, 1953).

<sup>19</sup> Aldo Leopold, "A Biotic View of Land," *Journal of Forestry* 727 (1939).

From this passage we see that Leopold's view is consistent with Clements' view that all species serve a specific function, but inconsistent with Clements' view that species functions were directed toward a single point, namely, the climax community. We also see that Leopold's view is consistent with Tansley and Odum's views about dynamism and energy flow (i.e. oscillations), but inconsistent with their ideas regarding equilibrium. The point is that the new paradigm is not all that new, so now the question is what makes it a new *paradigm*.

Thomas Kuhn famously defines a paradigm as the worldview shared by a scientific discipline and the practices that it employs in problem solving.<sup>20</sup> While I will not debate the merits of Kuhn's view here, it suffices to say that the new paradigm in ecology can be seen as a legitimate paradigm only when we combine the practices and modeling techniques it employs with the beliefs and values that underlie the flux of nature idea. The technical equilibrium paradigm combined with the non-technical balance of nature idea simply describes the natural world as a whole inaccurately, and must be replaced.

The call for replacing the old paradigm with the new is largely attributed to the publication of a collection of essays edited by ecologists S. T. A. Pickett and P. S. White entitled *The Ecology of Natural Disturbance and Patch Dynamics*.<sup>21</sup> There, the authors describe the structure of ecosystems as "patches"—spatiotemporal areas that are indefinitely bounded and influenced by "disturbances"—fluctuations that indicate

---

<sup>20</sup> Thomas Kuhn, *The Structure of Scientific Revolutions* (Chicago: University Press, 1962).

<sup>21</sup> S. T. A. Pickett and P. S. White, *The Ecology of Natural Disturbance and Patch Dynamics* (San Diego: Academic Press, 1985).

underlying natural processes which govern ecosystem functions.<sup>22</sup> Fluxes and disturbances in natural systems, Pickett and V. Thomas Parker define as

biotic or abiotic interactions that influence dynamics. Any process may influence a number of ecosystem characteristics simultaneously. A clear example of this is the differential effect of a fire, killing some individuals or species while stimulating the germination of others. Fires also transform nutrient dynamics by mineralizing nutrients previously bound up in organic matter.<sup>23</sup>

Generally, the new paradigm may be best described as a “dynamic non-equilibrium” theory of ecosystem structure and function. As the above quotation implies, disturbances facilitate natural processes, transforming the landscape from one condition to another. More specifically, and most importantly for our purposes, the new paradigm prioritizes the role of ecological processes over species interactions, mostly because species interactions are largely determined by natural disturbances.

To explicitly distinguish the new paradigm from the old, ecologists S.T.A. Pickett and Richard Ostfeld outline some of the basic assumptions of classical, “balance of nature” ecology, which are the following. (1) Natural systems are closed. (2) Natural systems are self-regulating. (3) Equilibrium comes to a point. (4) Disturbances to natural systems are exceptional.<sup>24</sup> The new paradigm in ecology challenges each of these assumptions,

---

<sup>22</sup> Ibid.

<sup>23</sup> V. Thomas Parker and S.T.A. Pickett, “Restoration as an Ecosystem Process: Implications of the Modern Ecological Paradigm” in *Restoration and Sustainable Development*, ed. K.M. Urbanska, N.R. Webb and P.J. Edwards (Cambridge: University Press, 2000), p. 17.

<sup>24</sup> S.T.A. Pickett and Richard Ostfeld, “The Shifting Paradigm in Ecology,” in *A New Century for Natural Resources Management*, edited by Richard L. Knight and Sarah F. Bates (Washington, D.C.: Island Press, 1995), pp. 263-5.

according to Pickett and Ostfeld, replacing the no longer plausible “balance of nature” conceptual framework with the more accurate “flux of nature” idea.<sup>25</sup>

According to the new paradigm, the ecological significance of fluctuations and disturbances can be extended beyond the narrow scope of the balance of nature idea. Disturbances such as wildfires, fluctuations in climate, wind and soil erosion, do not negatively disrupt the delicate equilibrium of nature, but rather characterize its continual flux.<sup>26</sup> That is, any ecological process that constitutes a disturbance, according to its scale and level of intensity—characterizes nature as in flux. According to Pickett and Ostfeld,

the term *flux* highlights variation, fluidity, and change in natural systems, rather than stasis, which is implied by the word *balance*. Although this metaphor does not deny the existence of stable points in nature, it focuses our attention on the fact that natural systems, which certainly do persist, do so as a result of a variety of fluxes.”<sup>27</sup>

Here it is important to reiterate that the new paradigm does not deny the existence of stability, balance, or equilibrium in natural systems altogether. Rather, the new paradigm acknowledges equilibrium in natural systems, but only on a spatiotemporal *scale*. Since disturbances can occur on many levels and affect multiple ecosystem characteristics simultaneously and in very complex ways, scale is needed to monitor and measure the rate and extent of disturbances. Pickett and Ostfeld define scale as “the term used to describe the relationships between two measurements such as the extent over which a

---

<sup>25</sup> Ibid., p. 266.

<sup>26</sup> Daniel Botkin, *Discordant Harmonies*.

<sup>27</sup> Pickett and Ostfeld, pp. 266-7.

process occurs and the spatial extent of a system.”<sup>28</sup> In other words, changes and disturbances in natural systems occur on different spatial and temporal scales. For example, eroding changes in the Grand Canyon may be measured on spatiotemporal scales of millions of years and hundreds of miles, where seasonal changes in climate, say, to a patch of wildflowers, may be measured on scales much less dramatic. Moreover, disturbances may occur with more regularity on a broader temporal scale, where on a smaller scale, they seemingly occur at random. The apparent regularity or randomness, balance or imbalance, order or chaos, is relative to scale—the rate, intensity, and extent to which changes in natural systems occur.

Note that scale is not an arbitrary imposition or projection upon natural systems, however. The extent and degree to which changes in natural systems occur is not an arbitrarily imposed “frame,” under which we derive qualities such as balance or imbalance. The logical sequence goes something like the following. A change, fluctuation, or disturbance is observed, we then measure the extent and degree of change—its scale—and interpret the data at different levels of description. For example, as we saw above, wildfires transform nutrient dynamics in forest ecosystems by returning nitrogen to the soil, which stimulates new growth. If we are able to observe a wildfire from a safe distance, we might try to measure its spatial and temporal dimensions—its scale—to monitor the ecological changes and natural processes it stimulates. We might then offer descriptions of what we have observed at different levels of scientific specificity, from small scale details about nutrient dynamics to large scale topographical changes in the landscape. Thus, whether a natural system is in a state of equilibrium or non-equilibrium will depend upon the scales of changes we observe.

---

<sup>28</sup> Pickett and Ostfeld, p. 268.

## THE NEW PARADIGM AND PROCESS-ORIENTED APPRECIATION.

Now armed with scientific knowledge the new paradigm in ecology provides, we are in a position to consider its aesthetic implications. As stated above, according to the new paradigm combined with the cognitive thesis, I make two recommendations: (1) that aesthetic appreciation should be directed to natural processes, not only natural objects, and (2) that qualities such as imbalance, disorder, and disharmony can be considered positive aesthetic qualities. I discuss the first of these two claims in this section. But before discussing what I will call “process-oriented aesthetic appreciation,” I first want to see what cues we can take from the major points of emphasis of the new paradigm in ecology, and see if they translate into aesthetic appreciation. Referring back to Pickett and Ostfeld, we need to recognize four characteristics of natural systems that may help guide our aesthetic appreciation: (1) natural systems are not closed, discrete objects, they are open and have indefinite, even shifting boundaries, (2) natural systems are not self-regulating, they fluctuate in non-equilibrium, (3) equilibrium does not come to a point, natural processes are directionless, they have no *telos*, and (4) disturbances are not exceptional, but common and necessary to facilitate natural processes. While recognizing these four characteristics of the new paradigm may make aesthetic appreciation more difficult, they are necessary if we are committed to a scientifically informed model of aesthetic appreciation.

To see if and how these characteristics of the new paradigm might translate into a model of aesthetic appreciation, we should return to Carlson’s defense of the cognitive thesis. Remember, Carlson holds that scientific knowledge “yields the appropriate boundaries of appreciation, the foci of aesthetic significance, and the relevant acts or acts

of aspection for that type of environment.”<sup>29</sup> Here I take Carlson to mean that scientific knowledge will provide answers to the questions of (1) what the appropriate context for appreciation is, (2) what should be the focus of our aesthetic attention, and (3) how to aesthetically appreciate a particular kind of environment appropriately. The four characteristics of natural systems listed above provide convenient answers to the criteria Carlson outlines. First, the appropriate boundaries of appreciation, as informed by the new paradigm, are set according to scale—the spatial extent and temporal rate to which natural processes unfold. Second, natural processes, as indicated by changes and disturbances, should be the focus of our aesthetic attention. Third, to aesthetically appreciate constant, dynamic, and fluctuating changes in natural systems appropriately, our gaze must be adaptive, fluid, and flexible, according to appropriate spatiotemporal scale. Answers to these questions provided by the new paradigm are problematic, however, and require further analysis.

If the appropriate boundaries for appreciation are set by spatiotemporal scales of dynamic changes, and scales overlap in multiple, complex ways, one might ask, “Which scale is appropriate from an *aesthetic* point of view?” One response might be that we select a scale, then search for and derive aesthetic qualities within that scale. This option, I think, is backwards in terms of aesthetic appreciation, according to the cognitive thesis. Aesthetic appreciation begins with the senses, and is then informed by scientific knowledge, thereby broadening and deepening our experience. Moreover, selecting a scale in order to derive aesthetic qualities within is arbitrary and goes against the idea that

---

<sup>29</sup> Carlson, “Appreciation and the Natural Environment,” p. 51.

we should aesthetically appreciate nature as it is, not how we “frame” it.<sup>30</sup> Scales are not arbitrary impositions upon natural environments, but discovered within environments.

A second, more plausible response might be that we directly observe a change, or changes in a natural environment that offers the most aesthetically appreciable qualities. We then simply select the scale according to which those qualities present themselves to our senses most effectively. Selecting the correct scale or scales is a function of what is directly presented to the senses. Scientific knowledge then informs our experience accordingly. Of course, some spatiotemporal scales are beyond our immediate capacities for aesthetic appreciation where others are not. For example, gazing into the Grand Canyon, it is easy to “read” its evolutionary history in terms of millions of years of erosion. On the other hand, directly observing nutrient dynamics between soil and species may be impossible with the naked eye. We might know something about nutrient dynamics, but little if anything is directly presented to the senses for aesthetic appreciation. However, I think it is a given that we directly observe changes in natural environments. Any change or fluctuation in an environment indicates *some* natural process, on whatever scale or scales it unfolds. A sense of wonder or imagination<sup>31</sup> may stimulate further inquiry into the observed change, where we “fill in the gaps” with scientific knowledge regarding the rate and extent to which changes occur, thereby establishing the appropriate context for appreciation.

---

<sup>30</sup> For a discussion of the “framing problem,” see Allen Carlson, “Formal Qualities in the Natural Environment,” in *Aesthetics and the Environment* (New York: Routledge, 2000): 28-38; see also Nick Zangwill, “Formal Natural Beauty,” in *The Metaphysics of Beauty* (New York: Cornell University Press, 2001).

<sup>31</sup> For a debate concerning of the role of imagination in aesthetic appreciation of natural environments, see Emily Brady, “Imagination and the Aesthetic Appreciation of Nature,” *Journal of Aesthetics and Art Criticism* 56 (1998): 139-149; and Marcia Muelder Eaton, “Fact and Fiction in the Aesthetic Appreciation of Nature,” *Journal of Aesthetics and Art Criticism* 56 (1998): 149-157. My view is that imagination should be constrained by scientific knowledge, which is consistent with Eaton’s account.

I now turn to what I call “process-oriented aesthetic appreciation.” If Carlson’s cognitive thesis is correct in suggesting that scientific knowledge will yield the appropriate “foci of aesthetic significance,”<sup>32</sup> the new paradigm will yield natural processes as the prime candidate. Because ecology in general focuses on *relationships* between natural objects, not only the objects themselves, natural processes take priority<sup>33</sup> over natural objects (by “natural objects” I mean a commonsense understanding of things like plants, animals, and the inorganic landscape). However, I am not arguing that we should aesthetically appreciate natural processes only, and neglect natural objects altogether. That would certainly limit what is aesthetically appreciable and result in a very impoverished notion of appreciation of natural environments. What I am arguing here is that natural processes affect all natural objects in one way or another, thus attending to how the objects in question are affected by changes in the particular environment seems appropriate.

The idea I am presenting here, that directly observable changes in natural objects indicate their relationships to natural processes, is not without precedent. Appealing to Charles Sanders Peirce’s semiotic notion of an *index*,<sup>34</sup> Cheryl Foster convincingly argues that

Just as a cumulus cloud serves as an index of convective activity from earth to atmosphere, so too does a bright yellow color become an index of a maple tree’s

---

<sup>32</sup> Carlson, “Appreciation and the Natural Environment,” p. 51.

<sup>33</sup> I take this point from Callicott, who argues that “ecological relations are prior to the things related,” in “The Metaphysical Implications of Ecology,” in *In Defense of the Land Ethic: Essays in Environmental Philosophy* (Albany: State University of New York Press, 1989), pp.110-111.

<sup>34</sup> Charles Sanders Peirce, “Logic as Semiotic: The Theory of Signs” [1923], in *Semiotics: An Introductory Anthology*, ed. Robert E. Innis (Indiana University Press, 1085), p. 13.

withholding of nutrients from its leaves. The object we see—a cloud or a leaf—stands in causal relation both to processes we cannot see and to our recognition of these relations as having occurred before, as being present in our memories.<sup>35</sup>

Foster labels this the “narrative” dimension of aesthetic appreciation. Natural objects serve as indexes or indicate underlying natural process, and thus reveal the object’s “story” or evolutionary history, which informs aesthetic appreciation. I generally agree with Foster’s account, with two qualifications. First, natural processes are not always unobservable. Changes or fluctuations in natural environments are often directly presented to the senses, and are thus aesthetically appreciable. For example, every spring in the Texas hill country around Austin, huge greenish yellow clouds of cedar pollen swarm about the landscape in a random and chaotic flux. Provided one is not allergic, these pollen clouds not only indicate a natural process, but are also beautiful in their own right. Second, these pollen clouds do not only tell a story about the natural or evolutionary history of pollination in the Texas hill country, they also indicate *ecological* relationships *in real time*—as we directly observe and aesthetically appreciate them. In other words, history is only part of the story. Yuriko Saito agrees when she says:

While there may be different degrees of nature’s skill in storytelling, none of its parts are mute. Simply by virtue of exhibiting various perceptual features, they all bear witness to their own origin, structure, and function, which we articulate

---

<sup>35</sup> Cheryl Foster, “The Narrative and the Ambient in Environmental Aesthetics,” *Journal of Aesthetics and Art Criticism* 56 (1998), p. 203.

verbally in our scientific accounts. Indeed, scientific discourse exists because of nature's observable characteristics.<sup>36</sup>

Saito, I think, is correct. Many natural processes are directly observable and are thus, as aesthetically appreciable as the natural objects they affect. Natural objects tell a story about the natural and evolutionary history of a particular environment, but disturbances exemplify natural processes and ecological relations that are directly observable and aesthetically appreciable. Interestingly, Carlson holds a somewhat similar view, which he calls "order appreciation"—the view that appropriate aesthetic appreciation of natural environments reveals the "natural order." He writes:

All of nature necessarily reveals the natural order. Although it may be easier to perceive and understand in some cases than in others, it is yet present in every case and can be appreciated once our awareness and understanding of the forces that produce it and the story that illuminates it are adequately developed. In this sense, all of nature is equally appreciable.<sup>37</sup>

Carlson's espousal of order appreciation has direct bearing on the scientific knowledge yielded by the new paradigm in ecology. The new paradigm denies that nature as a whole has some kind of overriding order. Indeed, the new paradigm—the flux of nature paradigm—tells us that nature as a whole is fundamentally *disorderly*, due to the

---

<sup>36</sup> Yuriko Saito, "The Aesthetics of Unscenic Nature," *Journal of Aesthetics and Art Criticism* (1998): 101-11. See also "Appreciating Nature on its own Terms," *Environmental Ethics* 20 (1998): 135-149.

"Appreciating Nature on its own Terms," *Environmental Ethics* 20 (1998): 135-149.

<sup>37</sup> Carlson, "Appreciating Art and Appreciating Nature," p. 120.

random nature of disturbances and fluctuations across the landscape. Unless, by “natural order” Carlson means *some* kind of order or structural and functional organization, the aesthetic qualities yielded by the new paradigm, such as *imbalance*, *disorder*, and *disharmony* run directly at odds with his account. Moreover, Carlson’s final thought in the above quotation, that all of nature is equally appreciable has to do with his defense of positive aesthetics. So, we might question, “if all of nature is equally appreciable, and order appreciation yields aesthetic qualities such as balance, order, and harmony, then are the aesthetic qualities such as imbalance, disorder, and disharmony yielded by the new paradigm incorrect or inappropriate?” To answer this question, I now turn to a discussion of the positive aesthetics thesis with respect to the new paradigm in ecology.

#### THE NEW PARADIGM AND POSITIVE AESTHETICS

Carlson’s positive aesthetics thesis has generated considerable debate.<sup>38</sup> In this section, I discuss how the new paradigm combined with the cognitive thesis may present problems for the positive aesthetics thesis. Namely, how the scientific knowledge that the new paradigm provides yields aesthetic qualities such as imbalance, disorder, and disharmony, which run contrary to the positive aesthetic qualities Carlson lists. I then argue that in light of the new paradigm, aesthetic qualities such as imbalance, disorder, and disharmony can be considered positive aesthetic qualities, thereby defending an amended version of the positive aesthetics thesis. But first, we should familiarize

---

<sup>38</sup> See Stan Godlovitch, “Valuing Nature and the Autonomy of Natural Aesthetics,” *British Journal of Aesthetics* 38 (1998): 180-197. Malcolm Budd, “The Aesthetics of Nature,” *Proceedings of the Aristotelian Society* 100 (2000): 137-157, Yuriko Saito, “The Aesthetics of Unscenic Nature,” pp. 103-9, Eugene Hargrove, “Carlson and the Aesthetic Appreciation of Nature,” *Philosophy and Geography* 5 (2002): 213-223, and Glen Parsons, “Nature Appreciation, Science, and Positive Aesthetics,” *British Journal of Aesthetics* 42 (2002): 279-295.

ourselves with some of the central claims of positive aesthetics. Describing the positive aesthetics thesis, Carlson writes,

All the natural world is beautiful. According to this view, the natural environment, insofar as it is untouched by humans, has mainly positive aesthetic qualities: it is, for example, graceful, delicate, intense, unified, and orderly, rather than bland, dull, insipid, incoherent, and chaotic.<sup>39</sup>

The general point Carlson is making here is that insofar as nature is pristine, that is, untouched by humans, it has positive aesthetic qualities such as unity and order, rather than incoherence, and chaos. The important implication here, for our purposes, is that aesthetic qualities such as incoherence and chaos are negative aesthetic qualities, where unity and order are positive. I will bypass the issue of whether these negative aesthetic qualities are so because the natural environment has been “touched” by humans. The question is, rather, why aesthetic qualities such as unity and order are considered positive aesthetic qualities, and qualities such as incoherence and chaos are not. One of the reasons the positive aesthetic qualities Carlson lists are so is because science locates these qualities in natural environments, and these qualities make the natural world more intelligible. In describing the relationship between correctness in science and positive aesthetic qualities, Carlson writes:

A more correct categorization in science is one that over time makes the natural world seem more intelligible, more comprehensible to those whose science it is.

---

<sup>39</sup> Carlson, “Nature and Positive Aesthetics,” p. 72.

Our science appeals to certain kinds of qualities to accomplish this. These qualities are ones such as order, regularity, harmony, balance, tension, resolution, and so forth. If our science did not discover, uncover, and/or create such qualities in the natural world and explain the world in terms of them, it would not accomplish its task of making it seem more intelligible to us; rather, it would leave the world incomprehensible, as any of the various world views that we regard as superstition seem to us to leave it. Moreover, these qualities that make the world seem comprehensible to us are also those that we find aesthetically good. Thus, when we experience them in the natural world or experience the natural world in terms of them, we find it aesthetically good.<sup>40</sup>

According to Carlson, science makes the world more intelligible to us, and it does so by describing and explaining nature in terms of aesthetic qualities like balance, order, and harmony. Here two questions come to mind when considering the new paradigm's influence on how we appreciate natural environments. First, if the new paradigm locates qualities such as imbalance, disorder, and disharmony in the natural world and explains the world in terms of them, does it not accomplish its task goal of making the world seem more intelligible to us? No. In fact, by measuring the temporal rates and spatial extent of dynamic changes, disturbances, and fluxes in the natural world, the new paradigm makes what was previously less intelligible under the old paradigm, more so now. Now, according to Carlson's reasoning, if the new paradigm makes the natural world more intelligible to us, then it does so by appealing to aesthetic qualities which we find aesthetically good, which leads to our second question. When we experience the aesthetic

---

<sup>40</sup> Ibid., p. 93.

qualities of imbalance, disorder, and disharmony in the natural world or experience the world in terms of them, do we not find it as aesthetically good as a natural world that is balanced, orderly, and harmonious? In other words, is a nature in flux less beautiful than a nature that is balanced? I don't see why it should be, according to the new paradigm. The problem is not with positive aesthetics, but with a scientific worldview—the old paradigm—that no longer provides accurate scientific knowledge of the natural world, and must be abandoned along with the outdated aesthetic qualities it appeals to in making the world more intelligible.

If we adhere to both the cognitive and the positive aesthetics theses, then the positive aesthetic qualities yielded should reflect the current science from which they develop. Further explaining how specific aesthetic qualities are tied to a scientific worldview, Carlson writes, “in light of various views about science, positive aesthetics might be, for example, absolute, culturally relative, or paradigm relative.”<sup>41</sup> If aesthetic qualities are paradigm relative, as Carlson suggests they might be, and the new paradigm in ecology locates qualities such as imbalance, disorder, and disharmony, then we are faced with the challenge of aesthetically appreciating nature in a significantly different way. The science based positive aesthetics thesis, that scientific knowledge yields mainly positive aesthetic qualities, raises the question of what kind of qualities will be yielded when the science in question has adopted an entirely different conceptual framework, as the new paradigm in ecology suggests. However, this is not to say that we must altogether abandon the aesthetic qualities to which the old paradigm is associated, such as balance and order. As the new paradigm suggests, qualities such as balance and order are tied to their spatiotemporal scales, but they are not appropriate descriptions of nature as a whole.

---

<sup>41</sup> Ibid., p. 94.

As Pickett and Ostfeld point out, the flux idea does not deny the existence of stability in nature, but focuses on the ecological significance of fluctuations and disturbances in natural systems. The new paradigm does not characterize nature as wholly random or chaotic, but rather that fluctuations and disturbances are characterized relative to spatiotemporal context and ecological significance. In other words, aesthetic qualities such as imbalance, disorder, and disharmony are relative to the conceptual framework disclosed by the new paradigm in ecology.

Because these ecological processes can interact in such complex and varied ways, the scale and degree to which they influence dynamics—the context in which these processes unfold—is essential in identifying aesthetic qualities within the new paradigm’s conceptual framework. The aesthetic qualities will be determined according to what spatiotemporal scales and levels of intensity these processes unfold, which will, as Carlson suggests, make the natural world seem more intelligible to us.

Returning to the question of whether aesthetic qualities such as imbalance, disorder, and disharmony can be construed as “positive” under the new paradigm, we might consider how these sorts of qualities have characterized much of modern and contemporary art and music. Automatic painting, abstract expressionism, kinetic sculpture, atonal, improvisational, and polyrhythmic music all exhibit aesthetic qualities that are consistent with the ones I have associated with the new paradigm in ecology. I fail to see any reason why these kinds of aesthetic qualities found in art and music cannot apply to nature as well.

Daniel Botkin addresses some of these issues in his book *Discordant Harmonies*, which puts the new paradigm in perspective for those unfamiliar with the details of

contemporary ecology. In a section entitled “Randomness and the Aesthetics of Nature” Botkin states “Nature that is inherently risky may seem less beautiful than nature that is completely deterministic.”<sup>42</sup> To address this provocative claim, we should review Carlson’s ideas about the relation between scientific knowledge and positive aesthetics. For Carlson, the information that ecology provides not only directs aesthetic appreciation, but also renders nature as having positive aesthetic qualities, qualities such as balance, harmony, and regularity.

While the new paradigm in ecology may be resistant to the polarities of “good” or “bad,” “positive” or “negative,” it does not entail that qualities such as imbalance and disharmony in natural systems cannot be considered as positive to some extent. In fact, the scale or degree to which natural systems fluctuate between these polarities may determine their more subtle aesthetic qualities. Thus if nature as a whole is as dynamic as it is stable, as random as it is predictable, as chaotic as it is orderly, then we must aesthetically appreciate it in a more adaptive and sophisticated way, which is the broader aesthetic challenge that the new paradigm in ecology presents.

## CONCLUSION

To sum up, I have suggested that the cognitive thesis, when combined with the new paradigm in ecology will require two important adjustments to what and how we aesthetically appreciate natural environments. (1) Because natural processes influence every aspect of the natural world to some extent, aesthetic appreciation should be directed to them, and (2) because the new paradigm appeals to aesthetic qualities such as imbalance, disorder, and disharmony in order to make the natural world more intelligible

---

<sup>42</sup> Botkin, p. 188.

to us, these qualities are consistent with the positive aesthetics thesis. More strongly, if we accept both the cognitive and positive aesthetics theses, *any* aesthetic qualities that science appeals to in making the natural world more intelligible to us can be considered positive aesthetic qualities.

As previously discussed, much of the conceptual foundations of both the old and new scientific paradigms and their associated balance of nature and flux of nature ideas reside in the Parmenidean and Heraclitean polarities of order and chaos. Advocating one polarity over another, I think, would deny subtle variations, tensions, and resolutions between them the two.<sup>43</sup> Of course, contrary to Tansley's notion of "dynamic equilibrium," we may experience more tension than resolution in nature, according to the new paradigm in ecology, but that makes it no less beautiful. In fact, I think it is reasonable to say (in line with both the cognitive and positive aesthetics theses) that our experience of beauty in nature is marked by scientifically and aesthetically measured degrees of order and chaos, in a dynamic tension and resolution of opposites. A more metaphysically based comment regarding given by Heraclitus along these lines is instructive, where he says, "the cosmos is the same for all; no god or man made, but it always was, is, and will be, an everlasting fire, being kindled in measures and being put out in measures."<sup>44</sup>

---

<sup>43</sup> I take this point from Donald Worster's, "Disturbing Nature," *Nature's Economy: A History of Ecological Ideas* (Cambridge: University Press, 1977): 388-434; "The Ecology of Order and Chaos," *the Wealth of Nature: Environmental History and the Ecological Imagination* (New York: Oxford University Press, 1993): 156-170; and "Nature and the Disorder of History," in *Reinventing Nature? Responses to Postmodern Deconstruction*, Michel Soule' and Gary Lease, eds., (Washington: Island Press, 1995): 65-85.

<sup>44</sup> Barnes, p. 30.

