



## Does Aesthetic Appreciation of Landscapes Need to Be Science-Based?

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*If beauty is in the eye of the beholder, what difference does it make if the beholder knows something? Does scientific knowledge of such things as ecosystems and biological processes affect their perception as aesthetic objects? Are landscapes and wilderness areas more beautiful or more awe inspiring to people who know something about them? These are the sorts of questions that philosopher Holmes Rolston examines in the following essay.*

*Rolston contrasts the immediate and subjective perception of landscapes with a science-based appreciation of landscapes. Rolston believes that "the eye of the beholder is notoriously subjective, hopelessly narrow in its capacities for vision," whereas "science cultivates the habit of looking closely." Throughout this essay, Rolston develops the claim that we cannot appropriately appreciate what we do not understand.*

### I. MYTHS, FOLKLORE, AND NATURAL HISTORY

The lava landscapes in Hawaii's Volcanoes National Park are quite aesthetically stimulating. On a memorable evening, I watched, in the twilight, red lava roll down into the ocean. The seashore on which I stood had literally been made only a few months before. Here was more land flowing forth; I knew something of how the world was made. Next morning, overlooking a dormant crater, steaming with sulphurous fumes, I noticed flowers and a little food. These were offerings made to Pele, a goddess who dwells in Kilauea volcano, placating her to stop the flow.<sup>1</sup>

Contrast my understanding with this native "superstition." The native peoples gave an animistic account; I know better—about tectonic plates, magma, basaltic lava, shield volcanoes, calderas, lava plateaux, and *nuées ardentes*. Yet, in my scientific superiority, I too there experienced the sublime, a virtually religious

experience, as lava out of the bowels of Earth created new landscape at the edge of the sea.

The American Indians repeatedly warned John Wesley Powell against his first trip through the Grand Canyon. The canyon once contained a trail made by the god Tavwoats for a mourning chief to go to see his wife in heaven to the West. Then the god filled up the trail with a river and forbade anyone to go there. Powell would draw Tavwoats' wrath.<sup>2</sup> But Powell saw the canyon geologically. He too experienced awe, but of the erosional forces of time and the river flowing. He went on to direct the US Geological Survey, and, interestingly, to head the US Bureau of Ethnology, concerned with Indian affairs. The Indian legends have only antiquarian interest; no one appreciates the canyon for what it really is, unless helped by geologists to know about the Supai formation, the Redwall limestone, the inner Precambrian gorge, and so on. That is the definitive interpretation.

The classical Chinese practiced *feng shui*.<sup>3</sup> The *shen* spirits were yang in character, animating heaven, the arable earth, sun, moon, stars, winds, clouds, rain, thunder, fire, mountains, rivers, seas, trees, springs, stones, and plants. The *gui* spirits were yin, especially unpredictable, and likely to be out in the evenings, in the dark, and in lonely places. Such spirits had to be considered. One avoids, for example, straight lines in buildings or roads lest they be offended, and puts an earthenware cock on one's rooftop, because the cock crowing at sunrise wards off the spirits. A life energy, *chi*, flows through the landscape and affects where one locates one's home, and what one can do in the fields. But that must make appropriate aesthetic appreciation of the real Chinese landscapes impossible.

Or consider what our great grandfathers thought about the mountains, which we now consider so scenic.<sup>4</sup> They were "monstrous excrescences of nature."<sup>5</sup> God originally made the world a smooth sphere happily habitable for the original humans; but, alas, hu-

mans sinned, and the earth was warped in punishment. Thomas Burnet is repelled by these "ruines of a broken World," "wild, vast and indigested heaps of Stones and Earth" that resulted when "confusion came into Nature."<sup>6</sup> John Donne called them "warts, and pock-holes in the face of th'earth."<sup>7</sup>

Now we know better. After geology, we are more likely to approach mountains, as did William Wordsworth a century later, as the supreme example of the permanencies amidst changes in nature, and the manifestation of "types and symbols of Eternity."<sup>8</sup> That may go beyond science, but it must go through science to go beyond. So do not prescientific peoples characteristically misunderstand the landscapes they inhabit?

## II. IN THE EYE OF THE BEHOLDER

But then another side of the issue comes to the fore. The landscapes that we ordinarily know are not pristine nature, but cultivated landscapes, rural or pastoral, with their towns and cities. Over the centuries, people have worked out their geography with multiple kinds of industry and perception, mixing nature and culture in diverse ways, no doubt some better, some worse. But who is to say that a science-based appreciation is the only right one?<sup>9</sup> Nature as seen by science is just the way we Westerners currently "constitute" our world—so the phenomenologists may say. There is no reason to think this the privileged view.<sup>10</sup>

Aesthetics—this argument continues—is nothing that science can discover on landscapes objectively, independently of persons. Aesthetic experience of landscapes is not some pre-existing characteristic of the landscape that is found, but one that emerges when persons react to landscapes. Landscape is land-scope, land taken into human scope. "Landscape *per se* does not exist: it is amorphous—an indeterminate area of the earth's surface and a chaos of details incomprehensible to the perceptual system. A landscape requires selective viewing and a frame. The 'line' of a mountain crest, woods, or prairie silhouetted against the sky is imaginary; it lies in the eye of the beholder. Landscapes need . . . the subjectivation of nature, or interpretation in terms of human experience."<sup>11</sup>

The Japanese love their landscapes tamed and manicured, more parks than wilderness.<sup>12</sup> They like artfully to prune their pines, cultivate simple flower and rock gardens, arrange a waterfall, attract some geese, walk a

path with a geometrically rising curve, look back, and enjoy the moon rising over the temple, silhouetting it all. They are hardly interested in admiring a pristine ecosystem or geological formations. Should we say that the Japanese are engaging in some aesthetic deception? Yet who are we to argue they should give up their art and learn our science? The argument is rather that humans are always the landscape architects, and even science is another cultural way of framing landscapes.

Consider my parents. My mother did not know any geomorphology or landscape ecology. Yet she enjoyed her familiar, Southern US rural landscapes. My father enjoyed the fertility of the soils in the Shenandoah Valley in Virginia; he admired a good field. On visits around, he would take a spade and turn the soil to see whether it might make a good garden. He always knew what watershed he was in, what crops were growing where. He loved a good rain. Both enjoyed the changing seasons, the dogwood and redbud in the hills in the spring, the brilliant and subtle colours of autumn.

If one is an expressionist, then whatever moods landscapes can trigger, they trigger, and that human relationship exists as surely as do the rocks or the forests on the landscape. Nature is a smorgasbord of opportunities that humans can do with as they please. No one aesthetic response is more or less correct than any other; what counts is the imaginative play, and what is remarkable is nature's richness in launching this play.

## III. BEYOND THE EYE OF THE BEHOLDER

Yes, but the eye of the beholder is notoriously subjective, hopelessly narrow in its capacities for vision. One has only to consult smell or taste, for example, to realize that much more is going on than the eye can see. Science, by extending so greatly human capacities for perception, and by integrating these into theory, teaches us what is objectively there. We realize what is going on in the dark, underground, or over time. Without science, there is no sense of deep time, nor of geological or evolutionary history, and little appreciation of ecology. Science cultivates the habit of looking closely, as well as of looking for long periods of time. One is more likely to experience the landscape at multiple scales of both time and space.

Humans are the only species that can reflect outside their niche. No other animal can do this, and science greatly helps us to extend our vision. Science helps us to see the landscape as free as possible from our subjective human preferences. Science corrects for truth. There are, for example, no "badlands," as my parents might have reacted to the western Dakotas. There are no "lonely places," although there are arid landscapes with little life, where the struggle for life needs to be especially respected. Things need to be appreciated in the right categories.<sup>13</sup>

Daniel Boone, exploring the wild Kentucky landscape, was too uneducated to see much of what was there, supposes Aldo Leopold. "Daniel Boone's reaction depended not only on the quality of what he saw, but on the quality of the mental eye with which he saw it. Ecological science has wrought a change in our mental eye. . . . We may safely say that, as compared with the competent ecologist of the present day, Boone saw only the surface of things. The incredible intricacies of the plant and animal community . . . were as invisible to Daniel Boone as they are today to Mr. Babbitt."<sup>14</sup>

But then again—Leopold checks himself—science is no guarantee that one will see what is there either. "Let no man jump to the conclusion that Babbitt must take his Ph.D. in ecology before he can 'see' his own country. On the contrary, the Ph.D. may become as callous as an undertaker at the mysteries at which he officiates. . . . Perception, in short, cannot be purchased with either learned degrees or dollars; it grows at home as well as abroad." The essential perception is of "the natural processes by which the land and the living things upon it have achieved their characteristic forms . . . and by which they maintain their existence."<sup>15</sup> Science or no science, everyone can gain some of that sensitivity. Although one can only know the evolutionary processes in deep time with the benefit of evolutionary theory, those who reside on landscapes know, or can know, the ecological processes well enough to appreciate life coping day by day, season by season, struggling and supported on the landscape. Indeed, Boone knew existentially what it is like to live on a landscape, something the Ph.D. may have never known. Beholders need to go beyond, but this is deeper into processes in which they are already participants in the landscape. My mother and father in Virginia and Alabama, and Mr. Babbitt in rural Wisconsin, lived with a keen sense of place.

Now the argument is that we cannot appropriately appreciate what we do not *understand*. Science understands how landscapes came to be and how they now

function as communities of life. But people, too, form their communities of life; humans cannot appropriately appreciate what they do not *stand-under*, that is, undergo; and the scientist *qua* scientist does not objectively undergo any such experience. That requires persons sensitively encountering landscapes, evaluating them, making a living on them, rebuilding them, responding to them.

The argument, it seems, must spiral around two foci—the one that aesthetic experience must be participatory, relating an actual beholder to a landscape; the other that nature is objective to such beholders, actually known in the physical and biological sciences. The pivotal words we use: scenery; environment; ecology; nature; and landscape form an ellipse about these foci. A richer aesthetic experience is constituted with both natural science and participatory experience in natural history.

#### IV. SCENERY AND ARTFORM, ECOLOGY AND EVOLUTIONARY HISTORY

Some persons enjoy landscapes rather like big art. Landscape paintings give us a taste for the real thing. What we want is not ecology, but natural art. Consider the autumn leaves in their colour, so much admired by my mother and father, indeed by us all. If one is a formalist, then it does not matter how the landscape originated. Find a vantage point where trees near and far, foreground and background, are pleasantly framed, and admire the vista. The historical genesis is irrelevant. A drive through the countryside is something like a walk through a museum of landscape paintings. In the United States, the Park Service builds pull-overs at the best selected spots, where tourists take pictures. Others buy postcards. This is appreciating the form, line, colour, texture of what we behold.

But now we can argue that to make a found art object out of a landscape is to abstract from what it ecologically is. The ecological processes are not just at the pull-over sights; they are pervasively present on the landscape. They are back home on the landscapes left behind. This organic unity in a landscape is not gained by treating it as beautiful scenery, though it might be found if one discovered its ecology.

A British visitor to the Rocky Mountains, despite the fact that his Denver hosts had urged him, "You'll love the Rockies," complained that there were too

many trees of too few kinds, mostly the same monotonous evergreens, too many rocks, too much sun too high in the sky, not enough water, the scale was too big and there were not enough signs of humans, no balanced elements of form and colour, nothing like the Lake District or the Scottish lochs.<sup>16</sup>

Can one argue that he was wrong? One argument is that he did not have the right scientific categories. He should not have expected a homey landscape, certainly not one like his homelands. If one visits semi-arid mountains, one should expect more rocks. If one goes into the tundra, the plants will be small, and the boulders will dominate, residual from glaciation. When you understand the harshness of an arid or an alpine climate, you will find the plants' clinging to life aesthetically stimulating. One will appreciate life hunkered down low to the ground, or bent and twisted trees persisting in cold and windblown environments.

The dominant spruce in the montane zone are evergreen and shaped as they are because they can photosynthesize year round and shed the snow; needles work better than leaves in the incessant wind. Lodgepole pine replaces itself after a stand replacement fire, hence the many trees all of about the same age. A Rocky Mountain forest does not lack essences in balance, as was complained by the unappreciative visitor; to the contrary, there life persists by perpetual dialectic of the environmental resistance and conductance, wind and water, hot and cold, life and death.

An emphasis on scenic beauty may lead one to devalue that which is not beautiful—the rotted log, or the humus, or trees that have burned, blighted, or contorted, or Burnet's "wild, vast, undigested heaps of Stones and Earth." One wants to be able to appreciate prairies, swamps, tundras, and deserts. We start looking out for a prospect that pleases us, a pastoral scene, something that photographs well, a recreational scenic view; but we end with insight into wild processes that ignore us completely. Just that insight outside our aesthetic response becomes aesthetically stimulating.

## V. ENVIRONMENT, ECOLOGY, NATURE, AND LANDSCAPE

The four words "environment," "ecology," "nature," and "landscape," have different, though sometimes overlapping, logics.

1. An *environment* does not exist without some organism *enviromed* by the world in which it copes; the

root idea is surroundings. An environment is the current field of significance for a living being, usually its home, though not always, should an animal find itself, for instance, in a strange environment. Environments are settings under which life takes place, for people, animals, plants.

2. *Ecology* is the *logic of a home*; the root idea is the interactive relationships through which an organism is constituted in its environment. Here an environment is a niche that is inhabited. There must be somebody at home, making a living there; ecology takes dwelling. One cannot visit one's ecology, though one can visit someone else's ecology. There is no ecology on the moon. But virtually over all the Earth myriads of species of fauna and flora are at home in their niches.

3. *Nature* goes back to a Greek and Latin root, *gene* (*gnasi, natus*, to give birth, to generate. A "native" is born on a landscape; "pregnant" contains the same root, as does "genesis." Nature is the entire system of things, with the aggregation of all their powers, properties, processes, and products—whatever follows natural law and whatever happens spontaneously. There are two contrast classes; the supernatural, which exceeds the natural, and the cultural, where artifacts replace spontaneous nature. Ecosystems are part, though not the whole, of nature. Humans have both natural and cultural environments; landscapes are typically hybrids.

4. *Landscape* is a section of the countryside that can be seen from some place. All of nature, from quarks to cosmos, is too much for us; we can only experience nature from perspectives, sometimes with telescopes or microscopes, but usually with the unaided eye. Landscape is the scope of nature, modified by culture, from some locus, and in that sense landscape is local, located. The question arises whether landscapes exist without humans. The moon is not itself a landscape, not a moonscape, not at least without astronauts to take the surface of the moon into their scope. Landscape comes into being in the human interaction with nature. The animals, much less the plants, do not appreciate aesthetically where they are. So landscape aesthetics is something that happens when humans locate themselves. My mother constituted her landscapes. My father constituted his. I constitute mine, whether as a scientist or as an inhabitant.

The natural world is there without us. When we constitute it, we want to appreciate something of the objective geomorphology and ecosystem that exists whether or not humans are interacting with it. Realizing

this, we can follow the argument that landscape perception needs to be science-based, as well as participatory. Science becomes the primary avenue for perceiving landscapes, better than any other—necessary though not sufficient for their most adequate understanding. My mother's appreciation of her landscapes would have been enriched with science, and I am the proof of that. Her son inherits her appreciation and greatly enlarges it.

## VI. MY ENVIRONMENT AND THE ENVIRONMENT

A horizon is perspectival. There are no horizons without perceivers. One sense of the word "environment" has that logic, noticing the modifiers. My environment is rather like my horizon. I take it with me as I move through the world. Horizons require an attention span. Analogously, my environment has an owner. We can spell this "environment" with a lower case *e*.

Arnold Berleant concludes: "This is what environment *means*: a fusion of organic awareness, of meanings both conscious and unaware, of geographical location, of physical presence, personal time, pervasive movement. . . . There are no surroundings separate from my presence in that place."<sup>17</sup> "For nothing can be said about environment that cannot be said about its people, since environment, in the sense I am writing about it here, includes a human factor."<sup>18</sup> "Environment is no region separate from us. It is not only the very condition of our being but a continuous part of that being."<sup>19</sup> "For environments are not physical places but perceptual ones that we collaborate in making, and it is perceptually that we determine their identity and extent."<sup>20</sup> My environment is my inhabited landscape, where I work and reside; our human landscape is where we have placed our culture. There are hardly any unpossessed landscapes. Landscape is personal and cultural history made visible.

But landscapes are more public and stable than horizons; we co-inhabit them with neighbours, others in our community. So *my* environment, true in short-scope, is rather too private a term. My environment when encountered as a landscape is a commons shared, your environment too, *our* environment. That demands another, fuller sense in which *the* environment is out there, the natural world that we move through, there before we arrive, and there after we are

gone. We can spell this "Environment" with an upper case *E*. Environment is not my creation; it is the creation. I do not constitute it; it has constituted me; and now it seems arrogant and myopic to speak of foreground and background, of what I frame on *my* horizons. Environment is *the* ground of my being, and we can remove the "my" because environment is the common ground of all being.

Landscape appreciation requires stretching environment into *Environment*. My mother could appreciate her Alabama lived environment; she did not need science to do that. But she could appreciate only her native range sector, a residential landscape, her field of significance, though she also knew it as the setting for the fauna and flora she saw there. She treasured her mother's quiltwork depicting the plants and animals on her farmland. Science alone does not give any such regional identity with a landscape, and such identity, too, qualifies one for aesthetic experience. A scientist without love for the earth is here disqualified. One's self is extended into one's environment, into *the* Environment. The subjective self knows its objective world, the creature rejoices in the creation.

## VII. SCIENTIFIC, PARTICIPATORY ENVIRONMENTAL AESTHETICS

We do not always need science to teach us what happens on landscapes, though science enriches that story. All who have had to cope in the world knew this, natives of landscapes wherever. Science brings insight into continuing organic, ecological, and evolutionary unity, dynamic genesis; but such unity may also have already been realized by pre-scientific peoples in their inhabiting of a landscape. Science can engage us with landscapes too objectively, academically, disinterestedly; landscapes are also known in participant encounter, by being embodied in them.

The Japanese, looking as they do for essences in landscapes, enjoy the transience of nature; how the cherry blossoms are here today, gone tomorrow, and will return again next year, and the next after that. Everyone who constitutes a landscape must also cope on that landscape, and in that struggle everyone who beholds landscapes can become sensitive to what is going on as the world continues on, even though they may not know its deep history in geological and evolutionary time. They know context, if not origins. They know

their environment, in the lower case; but they also know dimensions of the big Environment in which we live and move and have our being, because their local experience is a puzzle piece in that bigger picture.

Living on the landscape keeps persons "tuned in," and this dimension is needed, past mere science, to appreciate what is going on on landscapes. Certainly the human coping has produced mythologies that we now find incredible—Pele extruding herself as lava, Tavwoats replacing the trail to Paradise with a forbidding canyon river, the Chinese cocks on rooftops to guard off mischievous night spirits, an angry God warping the Earth to punish iniquitous humans. Science is necessary to banish ("deconstruct") these myths, before we can understand in a corrected aesthetic.

Yet there is a check on the extent of this error, because the coping myth must minimally reflect something of the struggle to live on from generation to generation; it must give its holders some sense of adapted fit on landscapes. They cannot be altogether blind to what is going on, indeed, the more they know about this, the better they survive. Such coping in humans has aesthetic as well as cognitive components. Metaphysical fancy has to be checked by a pragmatic functioning, and this includes an operational aesthetic with some successful reference to what is there at one's location. On the ground, we have to be realists, at least enough to survive.

Animals largely lack capacities for the aesthetic appreciation of their environments, though they prefer the kinds of environments for which they are adapted. Might we expect that for humans an aesthetic appreciation of environments has any survival value? Aesthetics, some will argue, has little relationship to biological necessity. People create metaphysics, others will argue, not to map reality but to insulate themselves from a world too tough otherwise to bear. Those archaic gods and superstitions, or the Form of the Good infusing itself on recalcitrant particulars, or the yang in counterpoint to yin—these are mostly untrue, as everyone in the scientific age now knows, even though they once helped people to cope. Are we also to suppose that those worldviews that could "frame" the landscape with beauty, even though the landscape is not so, have helped people to survive? Those who see the world pleasantly (and inaccurately) leave more offspring than those who see the world grimly (and accurately). Perhaps.

But it is a simpler hypothesis to hold that persons are in fact sensitive to beauty (variously constituted

through the lenses of this or that worldview, to be sure) to the extent that beauties (or the properties that excite beauty) are those confronting humans, and come naturally. There is no need to insulate oneself by pretending that it is beautiful. Coping might sometimes require self-deception; it could more often require a self that has become sensitive to its surroundings. What if we still find the landscape has its beauty, after we see through the lenses of science? More illusion? Or better insight into truth that had already been breaking through over the millennia?

Evolutionary theory requires also that humans be an adapted fit on their landscapes. If so, humans who find their environments congenial, or even beautiful, flourish, while those who find their environments stressful, or ugly, might do less well. Such human responses can be culturally introduced, or they can have a genetic disposition, or both. Humans rebuild their environments to suit their preferences. But elements of the natural environment remain in any cultured environment; the very idea of landscapes illustrates this. If there is some harmony between nature and culture, so much the more to the human liking. Some argue that humans prefer savannah landscapes, as these are the landscapes in which humans once evolved.<sup>21</sup> Trees, openings, grassy fields, green space, water, a home-site with foreground and background—these elements recur in landscape paintings rather transculturally.<sup>22</sup> Hospital patients with such views recover from surgery more rapidly.<sup>23</sup>

A persistent notion in many cultures is that exposure to nature enhances psychological well-being. Scientific studies are accumulating "steadily mounting evidence that there may be considerable correspondence across Western and some non-Western cultures in terms of positive aesthetic responsiveness to natural landscapes."<sup>24</sup> Indeed, humans in every culture enjoy aesthetic features in their landscapes, and it is difficult for them to come under the sway of mythologies or metaphysical cosmologies (or scientific theories!) that completely erase these features. It would also be difficult for mythologies and cosmologies everywhere to create these responses as mere appearances.

Cosmological ideas must "save the appearances," and many of these are "appearances" of beauty. Some beauty breaks through these worldviews, worse and better, because there is a certain existential immediacy to inhabiting landscapes, a *Sitz-im-Leben* grounded in participatory residence where the sensory perceptions confronting us are too strong to be argued away, or

cooked up, by the inferences from metaphysics. Actual landscapes keep impacting us, and our worldviews keep having to answer to this impact, willy-nilly, when we constitute our landscapes. Landscape is not passive; it acts on us. The constituting is a two-way affair.

Still, mistaken interpretative frameworks do blind us so that we cannot see what is there, they create illusions of what is not there, they leave us ignorant about what is really going on; and here science greatly educates us to what is really taking place. The native-range experience, though it has on-the-ground immediacy, lacks depth, and this deeper beauty is what science can unfold. Native-range experience to which we are genetically predisposed, or something reinforced because it produces cultural prosperity, might apply only to relatively homey-like environments, savannas, or places that we can rebuild as savannas. Science can enlarge us for the appreciation of wilder, fiercer landscapes.

So, to return to the native Hawaiians, the Southwest Indians, the Chinese, and the European theologians, we ourselves are misguided to suppose that they found nothing aesthetically positive in their landscapes, despite these aspects in their worldviews that introduced apprehension and prevented an adequate appreciation. Burnet, for instance, confesses that he was initially drawn to the mountains aesthetically: "There is nothing that I look upon with more pleasure," he first said, "than the wide Sea and the Mountains of the earth. There is something august and stately in the Air of these things, that inspires the mind with great thoughts and passions; We do naturally upon such occasions, think of God and his greatness."<sup>25</sup> If Burnet had pursued his studies further, in the Psalms or Job, he would have found that the Hebrews took the same delight in their promised land, mountains, valleys, and all, and interpreted it as the gift of God.

The Chinese, with their yang and yin, likewise celebrated following the natural; native Americans felt a keen sense of belonging on their landscapes; the indigenous Hawaiians lived in a community of beings where land, sea, sky, rocks, rivers, animals, plants were all alive and in the family—an enchanted world, we might say—and this view urged them to *aloha ʻāina*, love for the land.<sup>26</sup>

Science should demythologize these views but must itself find a new myth that encourages appropriate aesthetic responses to nature, responses that will sometimes be of the sublime and the numinous. Landscape is what it is, and science can be objective about that; but landscape as phenomena is difficult to dismiss as

mere phenomena, because the full story of natural history is too phenomenal, too spectacular, to be mere landscape; it is a sacrament of something noumenal. Sensitive encounter with landscape discloses dimensions of depth. And that might well have been happening before the scientists came along.

We are all aesthetic beings, first in the original, kinesthetic sense of that term; we are incarnate in flesh and blood and feel our way through the world. If science were to anaesthetize us, numb us to what is of value for our bodily well-being, we could not survive. That much we share with animals. We humans are aesthetic beings further in the philosophical sense. If science anaesthetizes us to the beauty in our landscapes, we cannot flourish. From here forward, a science-based landscape aesthetics is urgent, but it must also be a science-transcending aesthetic of participatory experience. A central feature of such an aesthetic will be the beauty of life in dialectic with its environments, the landscape as a place of satisfactory, satisfying adapted fit, on which we live, and move, and have our being. That is, ultimately, what environmental aesthetics is all about.

Once, tracking wolves in Alberta, I came upon a wolf kill. Wolves had driven a bull elk to the edge of a cliff, cornered it there, before a great pine, itself clinging to the edge. It made a good picture; the mountains on the skyline, the trees nearer in, the fallen elk at the cliff's edge. The colours were green and brown, white and grey, sombre and deep. The process, beyond the form, was still more stimulating. I was witness to an ecology of predator and prey, to population dynamics, to heterotrophs feeding on autotrophs. The carcass, beginning to decay, was already being recycled by microorganisms. All this science is about something vital, essential, and also existential, about living on the landscape. In the scene I beheld, there was time, life, death, life persisting in the midst of its perpetual perishing. My human life, too, lies in such trophic pyramids. Incarnate in this world, I saw through my environment of the moment into the Environment quintessential, and found it aesthetically exciting. As with the lava outpouring into the sea, sensitive to my location, I knew something of how the world was made.<sup>27</sup>

## Notes

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22. Judith H. Heerwagen and Gordon H. Orians, "Humans, Habitats, and Aesthetics," in Stephen R. Kellert and Edward O. Wilson (eds), *The Biophilia Hypothesis* (Washington: Island Press, 1993), pp. 138–172.
23. Roger S. Ulrich, "View Through a Window May Influence Recovery from Surgery," *Science*, Vol. 224 (1984), pp. 420–21.
24. Roger S. Ulrich, "Biophilia, Biophobia, and Natural Landscapes," in Stephen R. Kellert and Edward O. Wilson (eds), *The Biophilia Hypothesis* (Washington: Island Press, 1993), p. 97; Roger S. Ulrich, Robert F. Simons, Barbara D. Losito, Evelyn Fiorito, Mark A. Miles and Michael Zelson, "Stress Recovery During Exposure to Natural and Urban Environments," *Journal of Environmental Psychology*, Vol. 11 (1991), pp. 201–30.
25. Burnet, *op. cit.*, p. 109.
26. Dudley, *op. cit.*, p. 178.
27. This paper was presented at "Meeting in the Landscape," the First International Conference on Environmental Aesthetics, Koli, Finland, June 1994.

#### For Further Discussion

1. "We cannot appropriately appreciate what we do not understand." Do you agree with this statement? What do you think Rolston means by "appropriately" in this sense? How might Rolston respond to someone who claimed that "I don't know much about art, but I know what I like"?
2. According to Rolston, science can teach us things that will improve our capacity to see natural beauty. What, exactly, can science teach us about such things?
3. Rolston tells the story of a British visitor to the Rocky Mountains who complains about the monotonous scenery. Rolston asks, "Can one argue that he was wrong?" Can you?
4. Rolston contrasts the natural with the supernatural and the cultural. How would you distinguish among these three categories?