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Article

Humanity's Bioregional Places: Linking Space, Aesthetics, and the Ethics of Reinhabitation

John Charles Ryan

School of Communications and Arts, Edith Cowan University, 2 Bradford Street, Mount Lawley, WA 6050, Australia; E-Mail: jryan9@our.ecu.edu.au; Tel.: +61-08-0421-810-430

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Abstract: Originally theorized as a radical environmental movement, bioregionalism connects humanity to the specificities of a place. To establish greater cohesion between environments and cultures, bioregionalism endeavors to integrate societal activities and the nuances of natural spaces known as bioregions. The criticism of bioregionalism, however, pertains to the shortcomings of circumscribing culture within ecological boundaries. In light of its criticism, bioregionalism can strengthen its theoretical basis and its potential for cultural change by engaging critically with space, aesthetics, and ethics. This engagement first involves the recognition of bioregionalism as an ethical possibility based on the fundamental spatial unit of the watershed. A watershed comprises vital regional ecological processes, bearing discrete aesthetic properties and patterns. Through the sensuous possibilities of watersheds, a bioregional aesthetic can be integrated with an ethic of reinhabitation. The relation between space, aesthetics, and ethics gives form to and sustains the experience of place, which is intrinsically related to promoting the awareness of ecological sustainability.

Keywords: bioregionalism; aesthetics; ethics; environmental thought

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1. Introduction

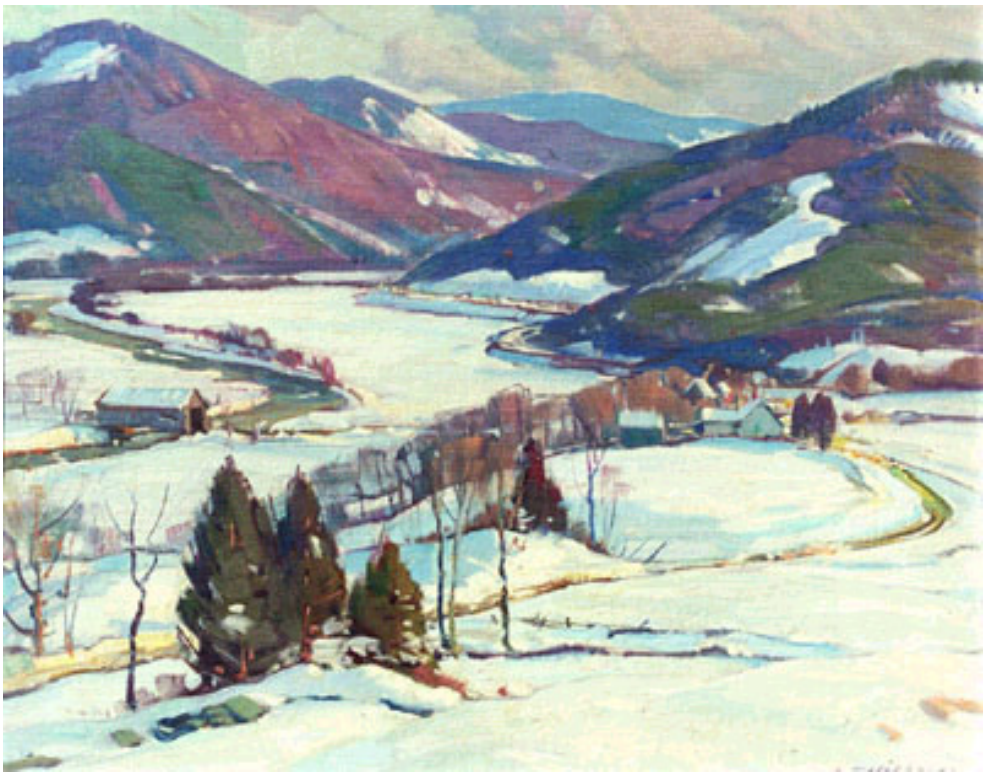
Amongst environmentalists, bioregional place has been viewed as the ecological context for transforming cultural relationships to nature. However, bioregionalism has not been adequately theorized; and the bioregion has been misconstrued as, simply, biogeographical space. This article makes the claim that bioregional place develops at the nexus of space, aesthetics, and ethics, and that the interaction between the three can sustain bioregional sense of place. This nexus, it will be suggested,

advances the theoretical basis of bioregionalism by clarifying the concept of the bioregion as an ecologically designated space imbued with aesthetic and ethical significance in the continual process of place-formation. The demarcations of the bioregion, rather than inherently limiting, are essential to the perpetuation of the space, aesthetics, and ethics dynamic, and, hence, the engendering of place.

In characterizing place as a complex of nature and culture, this article adopts a progressive format, as indicated by the section headings. For example, Section 3 "Bioregion as Space" is followed by Section 4 "Space as Watershed," the former elaborating on bioregionalism in relation to space and the latter on space in relation to watersheds. At the onset and throughout, however, I will emphasize the synergetic quality of place; and that a calculus of space, aesthetics, and ethics cannot account for the overall human experience of place. "Place" will refer to the complex integration of nature and culture that has formed—or is undergoing formation—in particular locations [1]. "Place" will be distinguished from the terms "region," "area," "location," and "locale," which will be used interchangeably with space. "Space" provides an ecological context for place and, for this argument, will refer to a biogeographically identified area with relatively discrete, though not rigidly fixed, boundaries. Space invokes aesthetics, the system of analyzing experience (not limited to visual), including the paradigms of beauty and sublimity, but also extending to ugliness experienced through the senses. Thus, we can have aesthetic delight when smelling fragrant flowers; aesthetic awe when beholding a massive gorge carved by a sinuous river; or aesthetic revulsion when trekking across a hot, exposed slope that has been denuded of tree cover. Aesthetic experience will be characterized as compelling, stirring, or moving in a pleasurable, shocking, or uncomfortable way, and it will be differentiated from "neutral" sense experience where the perceiver may be left with no such impact. Importantly, ecologically sustainable aesthetic appreciation will be argued for in order to incorporate ethics, the identification of actions through values and the assessment of situations for the correct or just course of action [2]. My model of bioregional place observes the intersection of space, aesthetics, and the ethic of reinhabitation, the decision to live in greater accord with the particularities of the bioregion.

In order to introduce the concept of bioregion embraced in this article, I will refer to the Connecticut River watershed (Figure 1). Spanning the northeast USA states of Vermont, New Hampshire, Massachusetts, and Connecticut, the Connecticut River watershed consists of numerous major tributaries, totaling several thousands of miles of waterways [4]. A predominantly rolling rural bioregion, the Connecticut River watershed comprises a diversity of species and places, including endangered plants and several urban areas. This has been my home, toward which I have been drawn back to live on numerous occasions during my life. It is a charming region of old New England town square quaintness and dense shady woods of hemlocks, spruce, and sugar maple, which during the autumn months set the hills ablaze in color. This is my bioregional place consisting of the physical space of river, distinct sensory presences of wild turkeys and pensile red trillium, and my burgeoning ethical engagement in its preservation.

Figure 1. Aldro Thompson Hibbard, *Connecticut River Valley, VT*, *ca.* 1928; Clarke Gallery, Stowe, VT [3].



2. Bioregionalism as "Reinhabitation"

Bioregionalism is a complex, inclusive, and variously conceived approach to integrating human activities to the environment, incorporating ecological, political, social, and philosophical concerns. A view of the world that begins with regions, bioregionalism is a diverse body of notions and practices informed by a pressing sense for the import of natural places in our lives [5]. Wendell Berry describes regionalism as "local life aware of itself" [6] but, I suggest, bioregionalism is "local life aware of itself in its natural setting." Amongst its advocates, bioregionalism's emphasis on natural places, in response to the disintegration of place-based cultural and ecological relationships, is viewed as a possible solution to the recurring pattern of human negligence toward the natural world. This first section theorizes bioregionalism, and then presents a characterization of bioregionalism as an environmental ethic and cultural sensibility, rather than an imposed social structure of adherence to natural boundaries.

The bioregional view asserts that the earth is divided into discernible ecological regions. Such regions are identifiable because of a pattern of physical features (e.g., high mesa of red sandstone) or life forms (e.g., a spruce-fir forest). The fundamental unit varies in different schemes, ranging from individual watersheds (e.g., the Connecticut River basin) to physiographic provinces (e.g., a coastal plain or the Appalachian plateau) to entire and often vast biomes (e.g., temperate grasslands) [7]. Bioregionalism contends that the earth may be known best through its diverse regional manifestations: "the earth expresses itself not in some uniform life system throughout the globe, but in a variety of regional integrations, in bioregions" [8]. A basis in naturally defined regions leads to the primary bioregional principle that, if human societies were to organize according to regional biogeographical patterns, they would become structured politically according to the aim of ecological equilibrium.

The process of social organization is termed "reinhabitation," learning to live in a place that has been disturbed through exploitation [9], although, presumably, non-exploited regions could also be reinhabited. Reinhabitation—chosen over the term "inhabitation" to stress that our displacement from natural regions is a non-normative phenomenon of modern living—is the realignment of agriculture, economics, politics, and all other dimensions of culture to the offerings and constraints of the naturally (biologically or geographically) defined region. Gary Snyder describes reinhabitants as:

> The tiny number of persons who have come out of the industrial societies (having collected or squandered the fruits of eight thousand years of civilization) and then start to turn back to the land, back to place [where] the actual demands of a life committed to a place…are so physically and intellectually intense that it is a *moral and spiritual choice* as well [emphasis added] [10].

With its focus on reinhabitation, the bioregional movement runs in contrary to the values of globalization and the obliteration of local communities [11]. Relph cites the homogenization of space—where places become interchangeable—as the central tenet of placelessness, the lack of cultural reference to place [12]. To impede the trend toward global monoculture, the process of reinhabitation entails the recognition of natural (instead of political or administrative) regions as organizing units for human activity and local culture, and as the structures for environmental adaptation [13]. The bioregional model accomplishes this integration through various ecological, political, and social methods (e.g., soil conservation to prevent run-off into river tributaries, decentralized governance, and internal currencies).

Many objections to bioregionalism assume that bioregional place is equivalent to natural space. Critics tend to depict bioregionalism as a naïve branch of radical ecology that identifies the resolution to environmental and social troubles as commencing with the identification of the bioregion and the despotic assignment of cultures to that region. "Nature dictates culture" as the non-human aspects of the space shape regional society. From this perspective, culture is chained to the dynamics of biogeographical areas. Criticisms often contend that an oversimplified concept of place based on natural borders fails to acknowledge the intricate web of environmental and cultural factors that makes up place, in reality. One critic writes that bioregional sense of place is characterized by the tendency to reason from "first principles, by environmental reductionism, and by the deification of the laws of nature" [14]. Similarly, Mick Smith argues that the bioregion is a relatively fixed site that prescribes the cultural possibilities of those inhabiting its dominion [15]. In the bioregional view, nature, not the social world, impacts sense of place. Predetermined bioregional boundaries weaken ethics, in Smith's view, creating a kind of provincial morality that has limited scope beyond the border of the ecological region [16].

The common thread between its criticisms is the contention that bioregionalism is a modern recapitulation of environmental determinism, a trend in early 20th century geography where the local biophysical environment was thought to govern social relations [17]. Within this model, the environment, and specifically climate, determines all social and economic aspects of a culture, leading to racial, economic, and moral stratification. The modern stigma associated with environmental determinism has resulted in a vigilant attitude among theorists toward strong causal links between the physical environment and culture [18]. This reflects back to the prevalent assumption: place amounts to ecologically circumscribed space. This article argues that both bioregionalists and its critics are at

fault, the latter for cursory representations of a complex belief system and the former for insufficient conceptualisations of bioregional place possibilities

In defense of bioregionalism, however, human cultural definition from within the bioregion plays as large a role in the identity of place, as do biogeographical borders [19]. The environment is not necessarily a social determinant. Moreover, reinhabitation as an "intellectually and physically intense…moral and spiritual choice" implies the decision (rather than adherence to Malthusian mandate) of a culture to align itself with regional nuances. Bioregional place does not equate to natural space nor is the bioregion a rigidly drawn ecological cubbyhole into which culture must be inserted. Instead, the bioregion necessitates the sustained and sympathetic interaction between nature and culture toward an equilibrium of loci.

Reinhabitation involves a return: a renewed accountability to the tangible structures of biogeographical space for the creation of an ecologically sustainable society. Bioregionalism will flourish, I propose, through direct reference to these structures. I suggest that reinhabitants will need to experience the bioregion through their senses; hence, clarification of structures is the crucial first step in the ethic of reinhabitation. But does this equate to a determinist's view of the world? Not necessarily, but I need to stress the physical world as context. Place is evolves out of the bioregion through interplay between human culture and the environment. This is analogous to how the structure of the classroom becomes integral to learning through the dialogue between physical space and human responsiveness. In lieu of the classroom, there may be the park, the room in a monastery, or the machine shop, but there will still be some "environmental" point-of-reference. Despite our best efforts, we cannot escape the climate, our internal chemistry, the wind, the mood of the sea, or the dry cold current from the air conditioner: the physical world perpetually engages us. Bioregionalism presents a model for steering this interminable entrenchment in the physical world.

Instead of determinism, possibilism more accurately represents bioregionalism by stressing two points: (a) participation in bioregionalism is in itself a choice and (b) a given bioregion offers a gamut of practical possibilities, from which culture makes choices in the ongoing creation of place [20]. For example, in the Connecticut River bioregion, community members first decide to include the watershed in their style of living; this is reinhabitation engaged. Secondly, a body of practical responses emerges to support bioregional place in the watershed, from which local society chooses. If internal currency appears to support the vision of ecological and social harmony in the region and can be applied in an economically sustainable way, then the practice can be selected by consensus. If the bioregional society determines that riverside housing is needed although bird habitat will be affected, then housing can be constructed but with minimum impact on the waterway as the guiding principle. In contrast, a deterministic paradigm might say that local currency must be implemented, riverside housing absolutely banned, and any deviance from the watershed is one step in the direction of social and ecological calamity. From the perspective of possibilism, human cultures have the ultimate choice to include nature or not, and if the human and nature relationship is to function sustainably (as in any relationship), we will have to want to do certain things instead of simply having those things imposed on us. Once culture chooses bioregionalism as its ethical horizon, decision-making intrinsically will take the local natural world into account.

3. Bioregion as Space

What exactly is a bioregion? How can we go about envisioning an ecologically sustainable society when the fundamental unit of reinhabitation is unclear? How can the ideal of reinhabitation—which verges on the quixotic to begin with—be forwarded through only a vague foundation? Bioregionalism's practical aspirations belie ambiguous, unconvincing, and variable ideas of the bioregion. One theorist even states that the identification of a bioregion "requires a sensitivity akin to that of the shamanic personality of tribal peoples" [21]. This section explores the mélange of current perceptions of the bioregion and suggests that bioregionalism could benefit through sustained reference to the watershed as ecological unit. As a pragmatic spatial delineation, a bioregion will be less susceptible to depiction as an idealized concept [22]. Throughout this section, I will characterize a bioregion as space in the process of becoming place through entanglement with human culture.

A review of contemporary bioregional literature suggests that bioregionalists are confused, non-committal, or in disagreement about the meaning of the bioregion. Kirkpatrick Sale offers the definition of a bioregion as being a place identified by its life forms, its topography and its biota, rather than by human political standards. It is a locale made discernible by nature, not legislature. Sale's definition is most often quoted as evidence of bioregionalism's supposed environmental determinism when he states that the bioregion may be delineated by "the human settlements and cultures those [biogeographical] attributes *have given rise to* [emphasis added]" [23]. On the other hand, Berg and Dasmann, the progenitors of contemporary bioregionalism, define the bioregion as both a geographical landscape and a terrain of consciousness, a geographical space as well as the body of thoughts that have developed about how to live in that locale. A bioregion can be identified initially by natural science, but the people who have long lived within the region finalize its boundaries [24]. Aberley presents a compatible view of the bioregion as a territory characterized by similarities of biophysical and cultural phenomenon that is best able to support the attainment of sustainability [25]. Jim Dodge offers a hodgepodge of criteria including biotic shift (the percentage change in plant/animal species composition from one place to another), watershed (drainage patterns), landform, cultural and phenomenological perception (you are where you perceive you are), spirit places (the predominate psychophysical influence where you live), and altitude [26].

The term *bioregion* is variously expressed. However, in order for the concept of bioregion to become precise there needs to be some agreement concerning its scale and composition [27]. Although a grassland, for instance, is ecologically cohesive, its scale might be too vast to engage significant public consciousness. A more appropriate scale might be smaller than a grassland yet large enough to encompass some significant ecological area. In terms of composition, the bioregion should be delineated with a clear basis in geography and ecology that has impact on place without determinism. When bioregions are construed as composites of all the factors that go into making place, both natural and cultural (spirit, social practices, historic land use patterns, *etc.*), the region is then subject to constant redefinition according to culture. If the objective is to make the bioregion a point of reference for culture and nature integration, then defining the bioregional space initially according to cultural standards seems contradictory to the central aim of bioregionalism to synchronize environment and culture.

The view that is taking form here may seem rigid, but the bioregional initiative must transition from a fuzzy set of beliefs into a more cogent, working knowledge base. Ambiguous notions of the

bioregion hinder the advancement of its ethical goal of synthesizing environment, lifestyle, politics, and economy. Even "working" bioregionalists such as Aberley present the bioregion as a conglomeration of historical political boundaries, current administrative boundaries, watersheds, physiographic regions, climate zones, native territories, plant and animal distributions, holy places and current human activity patterns [28]. Yet if bioregionalism's goal is to reinhabit regions, or in other words to sway cultural inclinations back to some kind of equilibrium with the landscape, how will historical political boundaries and current administrative boundaries that have largely ignored landscape patterns assist this objective? Bioregionalism needs direct reference to the natural world, much as a letter writer needs a pen and paper first. The letter that results, however, is greater and more significant than paper and ink; the place that results from bioregionalism will be more than biogeographical space.

Ecological thinking must assist in developing sustainable cultural practices and organizations according to circles of responsibility charted by the physical space of the bioregion. Within bioregionalism, the natural world is assumed to have a stake in the design of culture. With a clear conception of space, practices can be evolved that foster the choice of lifestyles that are consciously adapted to fit the limits and opportunities of ecosystem processes. However, this all depends on clarification of the bioregion, one that engages human experience of the local natural world.

4. Space as Watershed

The bioregion has been described as a biogeographical space, or the ecological constituent of bioregional place, an assertion that might seem to disregard the dynamic aspects of environments. However, place results from the synthesis of environment and culture. We need direct reference to palpable environmental realities first (e.g., water, rocks, plants, animals) in order to conceptualize the ecological aspect of place. The bioregion ought to have a solid and defensible basis in nature that is workable enough for ecologically sustainable place to emerge. This section suggests that the watershed offers such a basis.

The inclination to define bioregions along watershed limits is intermittently evident in the literature. Watersheds, as models that delineate local natural communities, are thought to provide the organizational basis for mediating relations between cultures and local environments. For example, Peter Berg designates the bioregion as "a geographical province of marked ecological and often cultural unity, its subdivisions...often delimited by watersheds, or water divides of major streams" [29]. The space becomes discrete through the biogeographical boundaries of its drainage basin where a connection is forged between events occurring in various subregions: on hillsides (e.g., clear-cut logging) and in valleys (e.g., over-sedimentation of streams from erosion).

Since the network of springs, creeks, and rivers in a space exerts a central influence on all non-human life there, the watershed might re-exert a similar influence on human life as well. The patient efforts of humans would be set in context by the work of rivers and watersheds—the worn features of the land reminders of the subtly-shifting equilibrium water has maintained with rock through time. Furthermore, the watershed might be the sensible level for the bioregion if only because it embodies our visceral longings for sustenance and nourishment. As a unit, the watershed—the visible

hydrological repository of all co-existent living beings—lends itself well to the capacity of human perception. Gary Snyder writes:

> A watershed is a marvelous thing to consider: this process of rain falling, streams flowing, and oceans evaporating causes every molecule of water on earth to make the complete trip once every two million years. The surface is carved into watersheds –a kind of familial branching, a chart of relationship…the watershed is the first and last nation whose boundaries, though subtly shifting, are unarguable [30].

In a different sense, the watershed represents delicacy and irretractable change: it is everything that can be lost. This is best evident in the fact that during the last half century, the instrumental view of rivers has prompted almost 75,000 dams in the United States: the undeniable reconfiguration of the waters of the continent [31].

For the bioregional ethic of reinhabitation to work, it must be applied at some meaningful level. The watershed suits this requirement, as it branches into smaller increments or subwatersheds. The "nested" conception is instructive here [32] and has emerged as the most appropriate application of bioregionalism in some regions [33]. In Vermont, for example, a proposed bioregional system includes single subwatersheds, medium-sized groupings of subwatersheds, the watershed, and partial ecological regions including several watersheds. The subwatershed is the basic unit (e.g., creek A). The next level would be the basins draining several subwatersheds (basin 1 draining creeks A & B). The third tier is the larger watershed level (Lake Champlain watershed constituting creeks A, B, C, & D and their basins). The final layer would be the ecological province (plateau consisting of multiple watersheds including Lake Champlain). Policy responsibilities would differ according to each level.

The broadest concern is that the sense for bioregional space arises from the environment. Otherwise, the premise of bioregionalism—that reinhabitation will diminish the gap between human practice and the environment—is obscured Bioregionalism needs a way to engage, through the experience of the local environment, actual individuals and communities in its ethic of reinhabitation. This engagement, ideally, is small enough for the experience of home yet large enough to suggest a sense for the connections needed amongst places. I explore how the watershed—larger than its constituent subwatershed yet smaller than the ecological province of which it is a part—can be suitable as the sensory catalyst of bioregional action and reinhabitation.

5. Watershed as Ecological Unit

This section defines the watershed, its delineation, and ecological function. The impact of watershed processes on the region circumscribed within it will be considered in order to characterize watershed processes as formative and influential—perhaps primary—ecological units. The watershed, sometimes referred to drainage basin or catchment, is defined as the natural unit of land on which all the unevaporated water falls (or trickles from springs), collects by gravity, and runs off via a common outlet. At this shared outlet, the flow enters another water body such as a stream, river, wetland, lake, or ocean [34]. In other words, the watershed is a region of land and its interconnected bodies of water that serve as a unified system for water transport; it is the basic unit of water supply [35]. The land area covered is not a factor in the definition of a watershed as they may be quite small (a fraction of an acre)

or quite large (hundreds of thousands of square miles across the continent) [36]. The Connecticut River watershed, at a few hundred miles from southern to northern tip, is a medium-sized example.

On quick inspection, the watershed would appear to be a rather fixed unit of the landscape, but from an ecological and hydrological standpoint, it is a *dynamic* and *changeable* area [37]. The geological history of a watershed reveals variation in the slope of the land toward the common outlet, the depth of the soil, and the pattern followed by the draining water. Some mature watersheds,—particularly in the northeastern United States, although not in other parts of the world—have almost no flat areas: the gradients of slopes and streams are quite continuous, well-incised valleys are prevalent, and sharp ridges mark a distinct watershed boundary [38]. Topographical break points or ridges such as mountain crests separate one watershed from the next. A typical northeastern USA watershed can be marked by a ridge divide and small headwater streams in the higher elevations of the drainage basin. Water flows downhill from the drainage divide into larger streams, eventually joining a river. The river then flows downstream into an even larger river at the confluence.

Watersheds are pivotal to the protection of the broader environment. River, stream, and slough corridors provide habitat for biodiversity, species movement and migration, water quality, erosion and flood control, recreational value, and aesthetic impact [39]. Many conservation or restoration efforts require a whole watershed approach that considers the entire pattern of water flow from headwaters to confluence with a river or outflow to the ocean. For example, the reintroduction or protection of salmon and the control of noxious riparian weeds begin at the watershed level [40]. Odum defines the fundamental ecosystem as the watershed including terrestrial and aquatic ecosystems along with humanity and human constructions, all functioning as a complex. He further suggests that the whole drainage basin, not just isolated bodies of water, must be considered as the minimum ecosystem unit when it comes to species conservation and human interests, such as maintaining water supply. Since water is a resource for the whole ecosystem, the entire catchment basin can be viewed as the management unit [41].

The United States Environmental Protection Agency (EPA) endorses watershed management for resource protection issues [42]. Interestingly, the EPA describes public involvement in watershed protection as conducive to a sense of community that increases "commitment to the actions necessary to meet environmental goals, and ultimately, improve the likelihood of success for environmental programs" [43]. The National Resource Conservation Service uses a watershed-based approach to conservation in California, where it has been adopted for bioregional organization. As examples, the Colorado Desert bioregion correlates to the Colorado River watershed, the San Joaquin Valley bioregion to the San Joaquin River watershed, and the Mojave bioregion to the South Lahontan watershed.

Cultural history should be acknowledged for its influence—whether positive or detrimental—on watershed ecology over the ages. The watershed, rather than presenting an unmodified natural slate on which culture will be superimposed, bears the markings of human societies, indigenous and modern. Even though the watershed as the fundamental bioregional ecosystem unit would reflect cultural impacts over time, it could still function as an ecological "point-of-reference" as long as the conception of space would prioritize the natural history of the region. This seemingly reductionistic cleaving apart of nature and culture is appropriate, I suggest, to assess more fairly the condition of the local environment and determine if existing cultural practices would contribute to the bioregional vision of re-balancing nature and culture. For example, the Connecticut River watershed was once

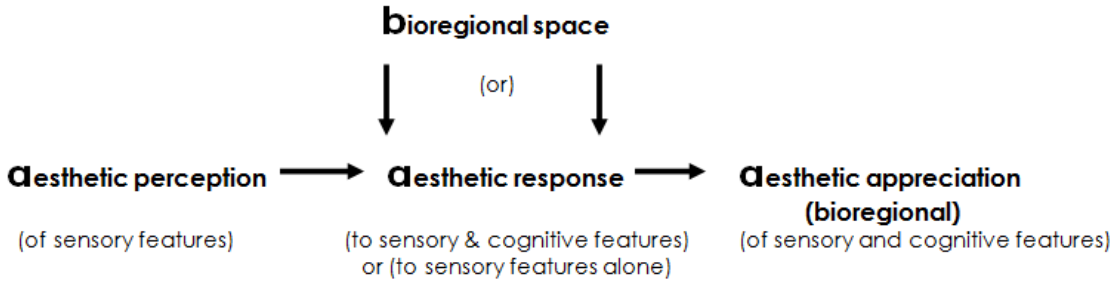
described as the most scenic trash receptacle in the USA and for many years chemical industries disposed of waste effluent directly into the river. At that time, defining the bioregion as a synthesis of culture and nature might have caused bioregional efforts to internalize the political structures inherent to the ecological abuse. Instead, bioregionalists want to separate those strands out, examine them, and then reconstitute them in a more sustainable way.

Hence, as an ecological unit based on the watershed, the bioregion can be more readily evaluated for its quality and integrity if conceptually held independent of culture. As the fundamental system unifying terrestrial and aquatic processes, the watershed has a strong stake in influencing the natural patterns of a region. The watershed suggests why, in order to come to appreciate the desert southwest, one must, as Wallace Stegner wrote "get over the color green" [44].

6. Ecological Unit as Aesthetic Milieu

With the watershed in mind as the fundamental unit of bioregional space, this section goes on to link ecological features to aesthetic concepts. I argue that for any depth of integration between humanity and naturally delimited areas to take place, bioregional space must underlie the aesthetic appreciation of the watershed. The particular kind of aesthetic experience I am interested in here occurs through the multiple senses and is supported, enhanced, and modified by knowledge. Since aesthetic experience in the context of the watershed is the catalyst in this conceptualization of bioregional place, some detail will go into the claim that natural science is integral to it. In general, aesthetic appreciation and natural science will be viewed mutually supportive in the creation of bioregional place; the intention will not be to trump aesthetics by cognitive understanding, but rather to show their dependency in a bioregional aesthetic system.

Figure 2. Model of Aesthetic Experience in Bioregionalism. The arrows are meant to indicate the steps in the process of bioregional appreciation whereby simple perception of the natural world is informed by bioregional space, thus producing an aesthetic response and, subsequently, a form of aesthetic appreciation based in bioregional awareness. The single direction of the arrows signifies the potential of this process to amplify through the addition of sensory (e.g., tactile features) and cognitive (e.g., scientific understandings) dimensions as experience of space develops into place.



To begin with, certain divisions in the aesthetic process will be observed. Aesthetic perception or engagement refers to the intake of charged sensory stimuli; the shimmering quality of the river catches my eye as I cross the bridge. Aesthetic stimulus refers to a quality, such as the shimmer of the river, which affects the perceiver and may be discerned from a non-aesthetic property or stimulus (e.g., the

surface of the river reflecting the sun). Aesthetic response or reaction follows perception with some kind of outcome; I proclaim "How beautiful!" or just silently have the feeling of joy. Aesthetic response leads to aesthetic appreciation, the more enduring after-effect of the sensory stimuli, which carries the element of care and attachment augmentative to the goals of bioregionalism; I am cycling home while the image of the river today reminds me of its general appeal during the early autumn months. Aesthetic experience refers to the entire process including perception, response, and appreciation, or a fragment of that process (Figure 2). Aesthetic perception requires sensory features and occurs independently of cognition. Cognition of bioregional space as ecological unit can modify either side of the aesthetic response (e.g., my companion tells me of the oil spill immediately after I perceive the sheen or several days later after I've had my response of "How beautiful!"). Aesthetic appreciation results from a combination of sensory experience and cognition.

Non-aesthetic features are integral to aesthetic experience. Sibley explains that "aesthetic concepts, all of them, carry with them attachments and in one way or another are tethered to or parasitic upon non-aesthetic features" [45]. Hence, aesthetic value in the watershed will consist of aesthetic features (e.g., the glistening quality of the river) and the non-aesthetic features on which they depend (e.g., the river's surface). In defining the watershed aesthetic, we can refer to perceptual indicators: particular non-aesthetic features that so dominate their natural surroundings that whole regions are identified with them [46]. For the Sacramento River watershed, as an example, the valley oak (*Quercus lobata*) bears its stout trunk, thick contorted limbs, and countless smaller branches changing direction at every node as testimony to the vigorous winds of the region. "How stoic is that lone oak!" along with a nostalgic feeling could be an aesthetic response. Other species also adapted to the Sacramento watershed, such as the Sargent cypress tree and the threatened blue oak characteristic of the foothills, carry their own aesthetic properties [47].

In addition to perceptual indicators, the overall aesthetic character of the watershed can be identified. Aesthetic character is defined as "a distinct, recognizable and consistent pattern of elements in the landscape that makes one landscape different from another, rather than better or worse" [48]. It is a composite of aesthetic qualities (e.g., starkness or lushness) and the intrinsically necessary non-aesthetic features, which they reflect (e.g., granite monoliths or moss covered rocks) [49]. The Sacramento River valley exhibits starkness as one aesthetic character [50]. Non-aesthetic features such as frequent tule fogs layer over the landscape in December and January when the extensive ground surfaces of the valley cool rapidly during the night to below the dew point [51]. Thus, individual aesthetic qualities, such as the somberness of light as it refracts among the fog, might contribute to the overall landscape character of starkness. This aesthetic distinctness is captured in the works of 19th century artists William Hahn and Albert Bierstadt. Hahn's 1875 painting *Harvest Time* portrays a wheat-threshing team against a spartan background of golden plains with a descending haziness in the composition possibly due to the early autumn onset of tule fog. Furthermore, Bierstadt's *ca*. 1872–1873 painting, *The Sacramento River Valley*, depicts the river on its descending path out of the luminescent foothills. In the ethereal light, the blue oaks of the foothills yield to the grasses of the valley floor, gleaming in the twilight horizon.

Sensory stimuli, as the basis on aesthetic perception, have the capacity to map the physical environment, the particularities of which vary from watershed to watershed, or animal to animal. This helps "humans to find their way around in the world [by mapping] form, symmetry, harmony,

structural patterns, dynamic processes, causal interrelationships, order, unity, diversity, and so on, discovered to be actually there [in the natural world]" [52]. For instance, some non-aesthetic features of wildlife exhibit a foundation in genetics and ecology. The black and white striped patterning of a zebra, rippling with the movements of the animal's muscles, reveals an evolutionary strategy for survival in the open savanna that is also *aesthetically pleasing*. Aesthetics, as variant of ecology in this sense, mark the gradations accompanying seasonal changes (such as the brightness of the robin's spring plumage), periods of drought or flood (the forlornness of the emaciated moose wandering the streets), protracted ecosystem change (the dulling of the woods as bright white birch trees give way to dark gray conifers), and abrupt environmental calamity (the shininess of the black oil coating the river). In addition to ecology underlying our aesthetic delight, the correlation of aesthetic properties and ecological processes extends to the more repugnant as well. One of the initial signs of a moribund ecosystem can be aesthetic revulsion (e.g., a feeling of disgust when viewing broken glass, fast-food wrappers, and used syringes along the river's edge).

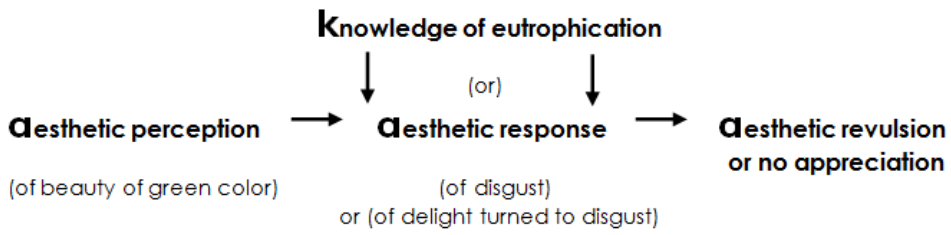
In this mapping of the physical environment, natural science brings together aesthetic appreciation and intellectual understanding, bridging the dichotomy between surface (sensory appreciation) and depth (cognitive understanding) that persists in Western thought [53]. Surrounded by the watershed, we easily intake the sensory stimulation of olive brown cattails alternating with deep hues of evergreen foliage. Yet, if beautiful stimuli are considered only as surfaces, their significance could be reduced. Conversely, ugly sensations can conceal significance. Should the malodor of the skunk cabbage along the watershed tributaries diminish admiration for the species' ecological role in the watershed? Behind these beautiful or ugly surfaces, there must be a unifying undercurrent between sensory appreciation and intellectual knowing, such that, despite its fetor, I know enough about the skunk cabbage to value it.

Natural science, I suggest, provides this undercurrent because it checks and supports aesthetic integrity: the gauging of the coherence of the aesthetic experience—through perception, response, and appreciation—for ecological values. I perceive the river's glimmer and declare "How beautiful!" but I later read an article that details the destructive legacy of the oil industry along the river. My ongoing appreciation is constrained by this knowledge, or aesthetic delight ends up in aesthetic revulsion, which then prompts me to act on behalf of the river. Carlson's model for the aesthetic appreciation of nature, which suggests the import of natural science [54], provides a useful basis for the assessment of aesthetic integrity. He presents the idea of order appreciation, which refers to the pattern imposed on the object by various forces etched in a narrative or story. Whereas the designed object can stand alone, the ordered object does not stand apart from its story of creation. Cognition of narrative, therefore, seems the reason why mundane, commonplace, or even repulsive objects can become aesthetically significant (e.g., the stench of the skunk cabbage becomes its signature, which reminds us of its value). The order-appreciated object needs an account and, in the aesthetic appreciation of nature, Carlson believes that natural science "reveals objects for what they are and with the properties they have" [55]. Hence, order appreciation (requiring cognition) is useful in describing the appreciation of nature as informed by the narrative of natural science.

Regarding this claim that natural science serves as an important narrative in the aesthetic appreciation of nature, consider how a bright, motionless layer of green algae covering a pond can be visually invigorating when encircled by the earthen brown tones of cattails. Plunging one's hand into the viscous lime-green slime is texturally stimulating, as strands of algae spider across the fingers to be

taken away by the thin amber water below. Despite the immediate sensory immersion of the algae-covered pond, knowledge of eutrophication (the overloading of bodies of water with nutrient run-off from such sources as lawns and agricultural fields, leading to an anaerobic water condition unsuitable for aquatic life) tempers the aesthetic response. The full playing out of the aesthetic experience, from the initial sensory perception of color and texture to the more enduring feeling of appreciation, could be limited by two levels of understanding: (a) green slime indicates an unhealthy ecosystem where normal, life-generating processes have been interrupted; (b) green slime is a result of nearby nutrient run-off, which could have been corrected through thoughtful human intervention. These two understandings could restrain the flourishing of aesthetic appreciation by halting or modifying the aesthetic process at the level of perception or response, depending on where these kinds of understandings enter into experience (Figure 3).

Figure 3. Model of Aesthetic Experience of Pond in Context of Bioregionalism. Natural science provides practical knowledge of eutrophication, causing an aesthetic response to change or not change accordingly. Reading the arrows from left to right only, one finds that aesthetic perception without scientific knowledge would undermine bioregional appreciation and an ethics of reinhabitation.



Natural science can truncate or modify the aesthetic experience; aesthetic judgment changes according to understanding of natural science. Furthermore, aesthetic appreciation should function with natural science if bioregional place is going to reflect ecological health (e.g., ponds with fish instead of slime). Even with the knowledge of eutrophication, one could have aesthetic perception and response (e.g., "What a beautiful green lake!") but the fruition of aesthetic appreciation might be restrained as a pleasurable experience or might turn into one of revulsion (e.g., I become nauseated by the sight of the pond). In a different sense, cognitive understanding can sharpen aesthetic experience by enabling one to perceive elements of the natural system and their relationship [56]. The sharpening of aesthetic experience of the pond might mean that delight turns to disgust, and, though negative, it is an aesthetic experience marked by ecological coherence. This is knowledge making the aesthetic response sustainable, as one becomes aware of the narrative in which the sensory stimulus is embedded.

Yet there is something more to aesthetic perception and response to nature that we don't sense, yet should be a constituent of the aesthetic appreciation of the environment. Eaton calls these non-perceivables: properties that cannot be immediately sensed [57]. Natural science tends to illuminate non-perceivables, not in the sense of enabling one to perceive them, but by bringing them to cognition. Since aesthetic perception (sensory in this case) is focused on what is present in the moment, these non-perceivable aspects (requiring cognition) can be easily missed. Watershed non-perceivables may include the remarkable cycling of water through the land, wetland drainages, and osmotic exchange of fluid through cellular boundaries, or, in the example of the pond, the slow infiltration of agricultural

effluents. Since it is difficult to tell what ecological health looks like, these integral non-perceivable features need exposure through some kind of reference to ecology, hydrology, and so on. Eaton asserts that knowledge of certain non-perceivables is pertinent to aesthetic experience in the same way that certain extrinsic features of objects (e.g. the room in which a particular painting is shown) are relevant to the experiences of certain intrinsic features of those objects (the coloration of the painting) [58]. Non-perceivables are non-aesthetic features that become aesthetically relevant when human sensory experience of nature is the goal.

7. Aesthetic Milieu as Ethical Sphere

Why is the convergence of aesthetic experience and ecological knowledge desirable? How can this convergence forward bioregionalism's practical objectives of reinhabitation? Reinhabitation as an ethical premise: communities or individuals come to the decision to live in closer relation to natural space. This section connects aesthetic perception and ethical response in the naturally defined space of the watershed. Once we come to appreciate an environment for its sensory possibilities, we then might endeavour to preserve it from pollution or rehabilitate it after it has been paved over, for example. This is the import of well-defined natural space: the aesthetics of nature, as immersing and engaging, lead to an identification with the landscape where I find myself in *my home territory* of the watershed [59]. The watershed, as an ecological unit with a corresponding aesthetic and non-aesthetic content, gives rise to an ethical sphere, the regionally molded ethical processes guiding activity in the home territory.

To begin with, the bioregional aesthetic has scale in its favor. Although cautiously, we can make the analogy that someone can more readily appreciate a painting on a wall in a museum than a Peruvian sculpture several acres in area that requires aerial viewing (and presence in Peru) for full appreciation. This is the advantage of manageable (human-level) scale, from which the ecologically grounded aesthetic unit of the watershed draws its power to invoke ethical response. The aesthetic engagement with nature as a precursor to ethical process seems most likely to occur in response to a smaller scale—trekking along a colorful mountain meadow, soaking in a desert hot spring, or boating the length of a river—rather than the global level of the whole earth or entire continents. A broad scale aesthetic experience could occur in response to, say, the images of the blue-green-white earth transmitted down from the first flights to the moon. Although compelling, these were photographs; vicarious experiences of the earth are not synonymous with direct perception of regional manifestations of the land where more than one of our senses is engaged and we are confronted by actual trees or ecosystems or watersheds needing protection or restoration. However, at smaller scales, images, such as paintings and photographs, can act as secondary aesthetic stimuli that prompt us to engage in direct experience with the environment. Indeed, we can care for space and place without an awareness of the dimensions of the bioregion; we can also experience visual appreciation of space and place through a two-dimensional representation, such as Hibbard's painting of the Connecticut River Valley in Figure 1. It is sustained multisensorial experience of space and place that promotes an ethic of reinhabitation as the core tenet of bioregionalism. While simply looking at a painting offers a limited scope of appreciation and care, it is reinhabitation that activates the multiple senses in creating place through immersion. For example, a bioregional cottage industry might incorporate the taste of local products made from wild-crafted plants growing only in that bioregion.

Knowledge underlies *ecologically responsible* aesthetic appreciation. Natural science, thereby, provides the moral dimension of aesthetic appreciation of the landscape [60]. Although pleasure, imagination, and emotion are vital to the experience of nature, knowledge of natural history is the foundation of ecologically sustainable aesthetic appreciation (*i.e.*, bioregional aesthetic appreciation) [61]. Reliance on sensory features alone could lead to equating beauty (e.g., alluring green pond with no fish) erroneously with functionality (a rippling brown healthy pond with various species of fish). Environmental toxicology describes the alluring green pond as the result of the massive influx of nitrogenous compounds. The algal covering, though possibly aesthetically engaging, belies the stagnant lifeless water below. The fecundity of the pond was exchanged for the anthropogenic algal covering. Life here is exchanged for luster.

Pertinent scientific knowledge (e.g., of eutrophication) must exist for bioregionally responsible aesthetic appreciation. Ecological knowledge can moderate the unbridled sensory response of "How beautiful!" shifting the response to one more cognizant of the environmental implications of the sensuousness. We want to photograph the pond, the glow of its ponderous green surface. The gooey texture of the algae contrasts noticeably to the amber fluid hidden below. Yet, without the critical understanding of the pond's preternatural appearance, an aesthetically related activity (e.g., painting postcards of the algal pond) cannot achieve an alignment with ecological values (painting postcards of functional ecosystems with life in the water to showcase the region's biological diversity). The intention is to establish human accountability to the bioregion, an outlook of concern for the physical space that views eutrophication, for example, as undesirable in its severity and rate. Aesthetic appreciation—the kind that uncritically extols the green pond—could contribute to ecological exploitation.

Ecologically coherent aesthetic appreciation is the gateway into the ethical sphere where concerns about the welfare of natural space—over the stability, integrity, and beauty of the bioregion—stimulate ecologically right action. For the aesthetic process to be of ecological integrity, the critical aspect of natural science can complement aesthetic perception or response. This is the difference between aesthetic perception and response, and aesthetic appreciation of nature, the latter carrying the ethical dimensions of verifying the initial perception with natural science to create sustainability and responsibility. The immediacy of the aesthetic perception and response, and the narrative quality of natural history achieve symbiosis in ecologically coherent aesthetic appreciation that I argue is in alignment with bioregional goals.

To stimulate caring attitudes toward the environment, aesthetic perception and response require ecology for bioregionally reflective appreciation to take form. Landscapes should be ecologically sound and aesthetically engaging in order to recruit public sentiment in their defense. Naussauer comments that "by first being palatable, landscape aesthetics ultimately can go beyond the merely acceptable to evoke intelligent tending of the land so that aesthetic decisions can become intrinsically ecological decisions" [62]. Aesthetic cues can be small informative signs telling of the various species in residence near riparian corridors or tidy walkways guiding one along scenic views of the bioregion. These indicators encourage ecologically sound relations to the watershed. In the Phalen watershed near Chicago, for instance, the restoration of a wetland emphasized the chain of lakes that forms the ecological spine of the bioregion [63].

In this ethical sense, the concepts of aesthetic character and integrity are germane to the bioregion [64]. Although aesthetic character will vary according to seasons (e.g., the characteristic tule fog of the

Sacramento River valley is at its height during the winter months), bioregional reinhabitation facilitates sensitivity for and perception of landscape sensory qualities through time. Hence, through extended exposure to the particularities of space, one learns to distinguish between the dynamic effects of natural forces such as seasons and human impact through modification, abuse, or management of environments [65]. Grasping aesthetic character, as a form of aesthetic perception (e.g., viewing the starkness) and response (exclaiming "How stark, indeed!"), does not require specialized knowledge of natural science. However, any ethical response emerging from appreciation of aesthetic character would need scientific grounding for the principle of aesthetic integrity to function. This view differs slightly from that posed by Emily Brady, mainly because I distinguish between aesthetic perception, response, and appreciation. Knowledge of natural science, I contend, is not essential to grasping aesthetic character because this occurs on the level of perception and response where sensory engagement is the only requirement. Appreciation of landscape character, however, of the kind that I suggest is formative of bioregional place, needs backing by natural science. My conception of aesthetic integrity also differs in that I define aesthetic integrity as the coherence of ecological and aesthetic value, whereas Brady defines integrity as the coherence of aesthetic character through time [66]. A change to a green algal color, from an amber color, marks a shift in aesthetic character. The green color disguises anaerobic conditions brought about by agricultural erosion. The understanding that an amber color is typical of healthy ponds could guide aesthetic integrity.

The view that is shaping up here might seem restrictive; only experts might be able to have the kind of aesthetic appreciation conducive to bioregional place. However, ecologically informed aesthetic appreciation follows from the premise that bioregionalism is consciousness of one's ecological space. Will one need to be a natural scientist? No more than one needs to be a political scientist to learn about foreign affairs; no more than one needs to be a plant scientist to tend a garden. What about the reluctant community member who just might like all ponds to become lime-green and doesn't mind the dead water underneath, even after knowledge of eutrophication? Since this article addresses bioregional place and the kinds of practices and ideas that contribute to its development, there is not enough room to address the "conversion" process in detail. We can persist with the effort of education, so that such person could eventually come to make the choice to reinhabit, since it just might be the best one for a sustainable environment and culture.

8. Ethical Sphere as Bioregionalism

How does the ethical sphere generated by ecology and aesthetics support the central bioregional tenet of reinhabitation? As expressed through possibilism (Section 2), bioregional communities and individuals choose to synchronize culture and watershed space; this adoption of bioregionalism is the initial ethical push forward, which then guides subsequent choices but in the already established context of integration. Although the bioregional aesthetic, as a kindling or organizing impetus, can compel one (or many) to decide to participate in the bioregional initiative, the practical outcomes of ethical deliberation are finalized by the individual or culture. However, influencing the process of translating the reinhabitation ethic to practice is the notion of the bioregion as locally distinctive in the response it engages. This relates to spirit of place, where "every place needs to be sensitively examined or

lived in as an individual place in order to discover and work within its distinctiveness" [67]. This section presents the distinctive characteristics and cultural practices that might constitute bioregional place.

Bioregional space exemplified by the watershed, serves as the context of bioregional actions and choices. An appropriate ethical response for one region may not apply to the next. The ethical sphere is contextual discourse that is more concerned with pertinence to its setting rather than global coherence, more concerned with bioregional or local truth instead of universal truth [68]. Bioregional narrative is a history that locates us in moral space, our physical location. We come to know the watershed valley as having an identifiable ecological character, so the onset of smog or urban haze appears an aberration. The bioregional narrative accentuates anomalies in the overall structure of the landscape; it provides the entire symphony by which we can identify instruments out of tune or notes out of key. However, such narratives are not givens from which ethical injunctions follow in the deterministic sense [69]. Individuals or communities make up their minds to implement or develop certain practices in accord with the temperament of the local land; the first, comprehensive, and most pressing choice is reinhabitation, which then sets all following decisions in the context of the ecological unit.

What kinds of cultural practices emanate from the bioregional ethic and thus go into place-based transformation? Although an exhaustive list is impossible, a few examples can be proffered. To begin with, a stronger convergence between the boundaries of natural ecosystems and the boundaries of local economic activity is integral to bioregional economics. This involves a better set of checks and balances between the constraints and potentials of a bioregion to provide resources, energy, water, food, goods, and services for itself and the capacity of the local economy to export resources and services into the broader economy [70]. Bioregional politics would seek diffusion of power in order to ensure that all decision-making would stem from the fundamental bioregional unit [71]. The bioregional response would need to incorporate urban areas. Sale remarks that the Hudson River watershed could more adequately meet the needs of New York City if the urban area began to adopt more internally oriented subsistence practices such as rooftop gardening and waste water recovery [72]. In terms of agriculture, planning, and building, an immense body of strategies (e.g., cover cropping, photovoltaics, and water recycling) has developed to minimize human impact on the watershed, especially in arid regions where population often outmatches the capacity of the local water supply [73].

9. Bioregional Place as the Confluence of Space, Aesthetics, and Ethics

As discussed, the formulation of a bioregional ethic is more complex than processing the aesthetic qualities of the watershed and substituting in appropriate courses of action. The ethical sphere of reinhabitation must take place. The dynamic between space, aesthetics, and ethics must be productive of place—the cultural and environmental network that constitutes one's home in the world. Furthermore, these three elements must some way sustain place as an ongoing formation. In this sense, the process of making bioregional place is comparable to the development of an organism: an initial period of intense growth precedes the longer, steadier stage of adulthood where energy is focused on upkeep of life processes (e.g., replacement of cells) rather than significant new growth. The emergent quality of place means that, with historical, cultural, or environmental change, new elements are added and old ones disappear [74]. What is the mitochondrial energy—that current—by which place emerges, nourishes, and modifies itself for periods of time or in perpetuity? I identify this as the ongoing

synergy of space, aesthetics, and ethics where one element sustains the others. The mutually generative relationship improves the theoretical basis of bioregionalism by (a) clarifying the concept of the bioregion as discrete space in the landscape and (b) integrating space into the aesthetic and ethical dimensions of bioregional place.

Place has been defined, in this article, as the synthesis of culture and nature. Bioregional place is a more specific variation because of its ethic of reinhabitation, where culture and nature cohere in a more balanced, enduring, dynamic, but not idealized way. The interpretation of bioregional place offered here hinges on the convergence of space, aesthetics, and ethics. The watershed has been chosen as the essential level because it is spatially coherent, ecologically fundamental, and, as a unit of perception, aesthetically tenable. Human perceivers must first come to value and understand the ecology of their region before any ethical course can follow (e.g., defending the quality of their water supply against ground contamination from industry, or preserving watercourses as vital bird habitat).

Aesthetic perception, as more reflexive than knowledge of natural science, galvanizes public awareness of the watershed, yet requires natural science to blossom into the positive appreciation we normally associate with aesthetic experience. This is a critical point: community response to the degradation of local ecology and public health often begins at the level of aesthetic perception. Negative aesthetic appreciation can indicate possible focuses of change. Consider the smell of a chemical factory that stimulates community organization, the motley coloration of local streams poisoned by industrial effluent, the corporeal sensations of nausea of dizziness caused by pesticide drift, or absence of aesthetic experience in the disappearance of bird songs in the forest. Even if our bioregion shows no indications of ecological disarray, we can still use positive aesthetic experience as ingress to checking that appearances are backed by ecologically sound practices.

Aesthetic experience promotes an awareness of landscape space and its ecological content, which then can engender ethical response. We might care for the environment through the entreaty of its sensuous features combined with cognition of natural science, which focuses our ethical energies. The watershed is the setting, the ecologically significant space; and though it may not be possible to apprehend the entire watershed at once, to inspect its borders and to have a total aesthetic response toward it, the process is one of becoming. Hence, initial aesthetic experience might include viewing a row of rushes lining a dry gully where water flows according to the seasons or noticing sudden transitions between plant communities where soil water content changes. Joan Woodward calls these marks "waterstains" or "blunt reports of water's former or hidden presence" [75]. Also, Nassauer's idea of "cues to care" in the design of landscapes signifies the importance of aesthetic details in contributing to a burgeoning sense of the entire watershed.

The ongoing aesthetic experience of the watershed is bioregional place emerging, always becoming. Even after we have taken in the entire watershed, there will always be infinite variations of angle, seasons, species, and cultural influences. This is the dynamic, changeable watershed partnered to an equally dynamic culture. Place is not a static phenomena, nor can it be reduced to plant species, geology, watershed, culture, or psycho-spiritual influences. Yet, these must be recognized for what they are: synergetic components of place; hence, my admonition that bioregionalism, as a movement toward rebalancing the culture and environment relation ought to be firm with its conception of the bioregion as ecologically delineated space. Such clarity honors the bioregion for what it is without extending place directly from it, in a deterministic sense.

The relation between space, aesthetics, and ethics is the current that sustains the continuous creation of bioregional place. Just as animals need ATP to stay alive, place needs an energy to invigorate it continually. Simply put, heightened aesthetic experience invokes further clarification of the bioregional space; a stronger spatial sense of the watershed broadens the ethical sphere; an expanded ethic backed by natural science further rouses aesthetic appreciation. This affirms the argument that bioregional place does not merely result from the reductionistic tallying up of space, aesthetics, and ethics but from a mutually supporting interdependency between the three elements.

An instance from personal experience might show, in a limited way, an individual's sense of bioregional place as emergent from space, aesthetics, and ethic. As an incoming student at one of the universities, I knew very little about the landscape of the Connecticut River region until I viewed a painting of the river, Thomas Cole's 1836 *The Oxbow*. Climbing to the top of Mt. Holyoke one April day, I wanted to confirm the lazy river's distinctive u-shaped bend and note the changes in the landscape during the 160 years since the artist captured it. The beauty of the painting became a secondary aesthetic stimulus that broadened my awareness of the ecological workings of the Pioneer Valley through which the river passes. Many years later, a commitment to place led me to join the river watershed council in working within such issues as water quality and the management of recreation as they pertain to this particular valley. Even today, my sense for the spatial scale of the watershed is growing and this accentuates the sensory pleasure I have when viewing the river's northern segments through Vermont and New Hampshire, or boating its southern portion near Long Island, NY. My ethical sphere has broadened sufficiently to allow reflections on the obligations all sections of the watershed have to cooperate in matters concerning shared activities such as local agriculture and industry in the effort to become more regionally self-reliant. This is the phenomenon of mutually reinforcing attributes: space supports aesthetics supports ethics. A sense for bioregional place constantly emerges (or weakens) out of growth (or decay) in these interactions. And even when one has spatially charted the entire watershed, an infinite variety of approaches to the space aid in further clarification, the sum of one's life work.

10. Conclusion: Beyond Boundaries

Why is a bioregional land ethic preferable to a globally oriented one, considering that many environmental problems are broader in scale than that represented by the bioregion? In creating bioregional place, why is it advantageous to "restrict" space to the ecological region, sensory experience to the aesthetic milieu, and right conduct to the ethical sphere? This final section suggests that bioregional boundaries are both integral to our experiences of watershed bioregions and that some environmental problems are best addressed from "bottom to top," that is beginning with bioregional places. Moreover, bioregional boundaries make possible porous connections to other bioregions. The borders of watersheds in fact present the possibility of caring between bioregions. Caring here begins with the local and, more precisely, the bioregional before encompassing the transregional or global.

Bioregions are really only circumscribed and defined by transitional regions, rather than strict borders [76]. These boundaries are not rigid, as in political ones, but permeable and may be marked by ecotones (where two diverse communities such as forest and grassland meet) or topographical ridges. Transitional regions allow of sense for how one region is aesthetically different from another by

bringing attention to differences in aesthetic character. The experience of transitional zones, rather than abrupt points of entering and exiting, is crucial to sensing the bioregional space as naturally defined. The experience is gradual and permeable like the place emerging in the bioregion. This aesthetic contrast enables sensory apprehension where the bioregion in which I live is distinctive because no other one has that oxbow in the river or that particular kind of oak, for example.

By marking the movement between biological regions, boundaries highlight aesthetic variation. In the following passage, notice how the speaker refers to transregional sensory variation as important to the experience of a single bioregion, and how the speaker seems to correlate sensory experience to ecological features:

> The Sonoran Desert is a bioregion…its common character is inescapable. When you travel beyond the boundaries of this bioregion, you know it from the disappearance of the saguaros and the mesquite. Within a few miles, you are looking at yucca and tall grass, or scrub oak and junipers, and you are not in the 'desert' any more [77].

This phenomenon of contrast occurs through perception, hence, independently of cognition. Contrast enables perceptual identification of the bioregion: you know it (that the bioregion has been left) because the disappearance of certain features. Thus you know it through the senses, after the contrast has been processed. This assessment presents the non-aesthetic features of various plants and suggests the general character of the region as "desert," which of course is also a natural science designation. The process by which the speaker might come to regard these non-aesthetic features as aesthetic qualities (e.g., the delicate sway of the tall grasses or the sublimity of the desert) cannot be addressed in detail here. The more important point is that boundaries, by permitting contrast, set the stage for aesthetic perception as they accentuate sensory features of one bioregion.

Borders are spatially and perceptually integral, but how are they ethically integral? Indeed bioregionalism has been criticized for having overtones of exclusivity and parochialism that can interfere with conservation priorities of global extent [78]. To the contrary, bioregional boundaries are vital because they circumscribe regions of caring, responsibility and possibility. While it is problematic to expect people to act together to protect global abstract things (e.g., the atmosphere), their behavior toward local, tangible, perceivable, familiar, emotionally charged, and engaging things can have significant ramifications for protecting the global ecosystem. For instance, local response to poisonous industry could amend the practices of the industry, in place, rather than forcing the business to less restrictive contexts where the environmental and social abuse could go on. Collective action on behalf of the local environment can infuse an ethic that will apply outside of the boundaries of that locale [79].

The call for the bioregion to become more spatially precise is not counterproductive to an ethics of reinhabitation. The recognition and adherence to bioregional boundaries makes possible a particular kind of bioregional aesthetics, ethics and science which is essential to integrity and care within the bioregion. This is not utopian provincialism hiding within watershed boundaries. Bioregionalism, in order to work in the twenty-first century and beyond, must include cooperative bioregional partnerships through initiatives such as cross-regional planning [80]. The bioregionalism I have advocated recognizes that the relationships between places are intrinsic to the vitality of any single place. In an era dominated by the displacing pressures of globalism, bioregionalism endeavors to

ensure that community can sustain its local environment and culture, in place, in an integrated way that will contribute to global sustainability. This entails thinking beyond boundaries.

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