

# Achieving *Querencia*: Integrating a Sense of Place With Disciplined Thinking

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## ABSTRACT

The Spanish word *querencia*, evocative of how feelings and deepest beliefs attach the self to place (Lopez, 1992), invites the rediscovery of the meaning of equity as a reciprocal relationship between peoples and the landscapes they inhabit. This article begins with an exploration of a concept of “reciprocal equity,” cultivated by achieving such a sense of place, in contrast with the tradition of “competitive equity,” pursued in ending disparities of achievement in traditional disciplines. Acceptance of the importance of reciprocal equity brings to focus the divergent purposes of education when studying places and disciplines. Places and disciplines hold in common the value of coherence, yet each coheres in its own fashion, places emphasizing personal experience and commitment to community, and disciplines stressing conceptual progress and explanatory ideals. Nevertheless, the shared concern for coherence suggests the potential to reconcile their divergent purposes and integrate a sense of place with disciplined thinking under superordinate aims. Criteria of artistic work—vivid depiction, finding the universal in the particular, constructive neglect, and coherence itself (Eisner, 1998), fulfill this function. Disciplines that focus attention on place as landscape and commons prompt integration as well. *Querencia*, as both a meaningful attachment to a geographic place and as a place in the mind where understanding satisfies, completes the integration.

## A RIVER JOURNEY TO *QUERENCIA*

We caught a fish and talked, and we took a swim now and then to keep off sleepiness. It was kind of solemn, drifting down the big, still river, laying on our backs looking up at the stars, and we didn't ever feel like talking loud. . . . (Twain, 1948, p. 97)

Sometimes we'd have that whole river all to ourselves for the longest time. Yonder the banks and the islands. . . . It's lovely to live on a raft. We had the sky up there, all speckled with stars, and we used to lay on our backs and look up at them, and discuss about whether they was made or only just happened. (Twain, 1948, p. 177)

—Huck Finn

What is curriculum, this ubiquitous construct that, like art, everyone knows when they see it? Do you ever wonder, in company with Huck's musing about the stars while journeying on the river, whether curriculum is “made” or “just happens”?

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Huck's river journey is an apt metaphor for curriculum. It captures a sense of adventure, of surprising turns, of having a goal yet being ready for unexpected opportunity. Rivers promote a sense of place, a feeling of identity learned from the rhythms of one's surroundings. Rivers endure and change. Rivers are both untamable and navigable, beyond complete control, yet subject to engineering. Engineers design and build levees and dams, gauge runoff, and plan releases of impounded water. Nevertheless, although managed as machine, the river responds as organic in nature (White, 1995). Rivers sculpt landscapes. They exist both as tangible experience and abstract imagination.

Huck's journey on the river unfolds as a series of events connected in surprising ways as Mark Twain creates story from images of land and people, leaving the reader with lessons to ponder about morality, character, and becoming "civilized." The imagery of the river aptly serves as a metaphor for curriculum, ever leading from one place to another, its channel sometimes entrenched and sometimes shifting in unpredictable ways. Like Huck's river, a curriculum may endure yet change, embody imagination and experience, and accommodate unanticipated events. Successful curriculum crafts meaningful stories out of shared experiences. The making of curricula makes room for things that just happen, becoming a quest for meaning and connection, a lovely drift on a raft, an enduring conversation about the speckled sky.

So, too, does the mix of engineering and organic response, leading in directions unintended and unanticipated despite the objectives, accompany the navigation of curriculum. The journey often unfolds unpredictably, flowing out of the bounds of well-marked channels. In contrast, curriculum design too often feels excessively prescriptive, as if attempting to manage, to control, to channel, according to a fixed and unchanging purpose, Huck's river. Control stems from politically imposed mandates to make the curriculum do exactly as wished in the belief that the promise of standards-based education and success-for-all accountability will produce international competitiveness.

Through curriculum, a society seeks to re-create and reform itself. The curriculum needs to be made. And the making of curriculum must respond to the social aims of schooling. The journey inevitably leads somewhere, these social aims marking the channel along the river. The journey, whether made or just happened, courses through a landscape of places, both cherished and feared, both familiar and mysterious, inhabited by both charlatans and friends. As the journey ends, companions return home, perhaps finding renewed strength and recovery within their community—whether Hannibal, Missouri, or elsewhere.

They may achieve *querencia*, a word borrowed from Barry Lopez's *The Rediscovery of North America*. According to Lopez (1992), the Spanish *querencia* refers to "a place on the ground where one feels secure, a place from which one's strength of character is drawn—a place in which we know

exactly who we are—the place from which we speak our deepest beliefs” (p. 39). *Querencia* encompasses a sense of self drawn from a relationship to place. *Querencia* secures the feelings and deepest beliefs that attach the self to community and landscape.

*Huckleberry Finn* tells the story of people embedded in their landscapes and times, with lessons to learn across many generations and places. The novel exemplifies the construction of “place” and its intimate understanding. Expanded and elaborated through careful inquiries into local stories, such intimate understanding of place stands as an ideal for curriculum design (Gruenewald, 2006; Gruenewald & Smith, 2008; Smith, 2002, 2007a; Smith & Williams, 1999; Sobel, 2004). In this approach, meaningful attachment to place enhances a learner’s identity and transforms the learner’s commitment to community well-being (Gruenewald, 2003a; Semken, 2005), grounding character, strengthening voice, and building security.

The journey down the Mississippi through a landscape of distinct places educated Huck and Jim. Did they find “attachment with meaning” (Gruenewald, 2003a) and achieve *querencia*? For fictitious characters from the mind of Samuel Clemens (Mark Twain), the answer must remain the subject of literary criticism (it is doubtful, however, that Huck became an abolitionist). For the author and his readership, the novel suggests the recovery of strength in the context of place and the grounding of beliefs (about race, for instance) with concern for their consequences (the estrangement of friends).

### **Place in Conflict With Disciplines and Equity?**

The role of “place” in curriculum design makes room for the “just happens”—spontaneous inquiry—as well as the “made”—deliberate course of study with the understanding of place as a focal point. Place, however, as an object of study, is unlike other subjects: It integrates knowledge around the learner’s experience embedded within a particular landscape and community. The aim, as Gruenewald expresses, is “attachment with meaning.” Traditional subjects, derived from scholarly communities and transformed according to social and political agendas (for example, adding to the “pipeline” of future scientists and engineers), offer coherence and meaning from a different perspective: the aim is “conceptual change” (“with usefulness in a social context” adds E. L. Smith [1991], in his elaboration of the “conceptual change approach” to teaching science, introduced by Posner, Strike, Hewson, & Gertzog [1982]).

The teaching of traditional subjects according to widely disseminated standards and benchmarks supports the measurement of knowledge and skills for the purpose of equitable rankings of student performance. These

measurements, in turn, have become central to ending disparities of school performance among different populations in the name of equalizing opportunity. This situation suggests tension, if not conflict, in attempts to make place central to curriculum design because an emphasis on place may largely reduce the dominance of subject knowledge (and skills) as the driver of curriculum reform and complicates efforts to achieve test score parity across social groups.

The challenge to place enthusiasts is twofold: (1) honor equity and (2) respect subject knowledge. To meet this challenge is to reconcile the value of “attachment with meaning” to place with the value of equitable achievement in traditional disciplinary contexts. The task is (a) to reconfigure and enhance the meaning of equity and (b) to recontextualize and restructure knowledge from the disciplines. Resources for solving the problems of subject-specific, theory-generated problems must transform into resources for achieving a sense of place, interpreting landscapes, making inquiries into local stories, taking civic action, and improving community life. At the same time, respect for learner identity and cultural heritage ought to extend the meaning of equity (the first task) to encompass a sense of responsibility, of reciprocity between society and learner.

In this article, I refer to the traditional sense of equity as “competitive equity” and to the place-enhanced sense as “reciprocal equity.” Moreover, I attempt to reconcile the potential for conflict between place and discipline first with attention to their shared commitment to coherence (though of different types) and second by exploring *querencia* as a disciplined state of mind and as a meaningful sense of place. Each aspect reinforces the other in the context of inquiry into local stories. This integration deepens with recognition that the criteria of artistry discipline the study of place and that different conceptions of landscape encourage the transformation of subjects. The journey ends with a story of local knowledge, sense of place, and attachment with meaning crossing generations: a story of fossil footprints, conservation and preservation, military training, and an allosaurus skeleton under a Colorado teenager’s bed (Johnson & Troll, 2007).

### **EQUITY AND INTIMACY WITH THE LOCAL LANDSCAPE**

The distinction between curriculum that is “made” (intentionally designed in accordance with well-established bodies of knowledge) or curriculum that “just happens” (spontaneously developed in response to personal interests, cultural norms, or child development) has framed pedagogical debate for at least a century. John Dewey resolved the tension between responsiveness to child development and transferring the heritage of disciplined subjects with recognition that these positions are but end points of

a continuum: the child always at a given stage in the “development of experience” and the subject ever present as a source of direction, as a resource for extending experience:

For the scientist, the subject-matter represents simply a given body of truth to be employed in locating new problems, instituting new researches, and carrying them through to a verified outcome. . . . The problem of the teacher is a different one. . . . He is concerned with the subject-matter of the science as representing a given stage and phase of the development of experience. . . . Hence, what concerns him, as teacher, is the ways in which that subject may become part of experience. (Dewey, 1990, pp. 200–201)

Dewey’s focus on experience alleviates some of the tension between child-centered and subject-centered pedagogies, yet leaves open the question, “Which experiences, in what directions, merit development?” Valuing the role of experience in learning and matching of experience to development promotes good teaching. Clearly, knowledge of a subject is instrumental to solving problems. However, assigning significance to problems depends upon value judgments—the relative importance of place, for example. With apologies for reducing a complex body of philosophy to a short phrase, we might reasonably summarize Dewey’s answer to the question of direction as preparing citizens for lives of social responsibility in a democratic society. Furthermore, from this perspective, democratic suggests not only the mechanisms of governance, but also the manner of living in a community—with citizens having genuine influence over the social forces and institutional structures that shape their lives. Technological complexity, corporate power, globalized markets, labor insecurity, popular culture, persistent poverty, crime, massive concentrations of wealth, and so forth, when conducive of cynicism jeopardize democratic ideals. Unless citizens are deliberately educated to assume responsibility, not just to compete with one another, democratic living fails and place suffers.

From this perspective, the rhetoric of closing the gap, equalizing opportunity, imposing accountability, and standardizing achievement sounds inadequate. The aim of achieving democratic living focuses attention on the value of social responsibility, as well as upon individual opportunity: on the value of participating in the life of the community, as well as upon a role for an individual’s unique talents. Schools that sustain democratic living serve the public good just as do schools that promote individual competitiveness. While the momentum of standards and accountability restricts the meaning of equity to opportunity for the individual, the aim of democratic living enhances its meaning to encompass responsibility to the community. The concept of place, with attention to the role of schools in creating sustainable communities, brings Dewey’s voice into the 21st century, mindful of the reciprocal relationship between individual and society, person, and place.

### **Achieving a Sense of Place to Enhance the Meaning of Equity**

Place is abstract, a palimpsest of landscapes. We exist in a place, yet depend upon interactions with an innumerable host of places. Place, as an object of inquiry, presents confusing, fluid boundaries, inviting us to achieve intimacy with the landscape and attachment to the community. As voiced by Smith (2007b) in an address to teachers, we ought to cultivate among students “an abiding love for a place, a desire to assure its beauty for generations to come.” In Gruenewald’s words, “Places, and our relationships to them, are worthy of our attention because places are powerfully pedagogical. . . . Fundamentally significant knowledge is knowledge of the unique places that our lives inhabit; failure to know those places is to remain in a disturbing sort of ignorance” (Gruenewald, 2006, p. 27; Gruenewald, 2008, p. 143). Place, for Smith and Gruenewald, anchors moral commitment and profound wisdom.

Place is a complex crossroads, not an isolated locality within a static landscape. Historical, geological, sociological ecological, and economic trajectories of change intersect in the places where we live. Place, along with nature and justice, is a social construction. Place is a dynamic construct dependent for meaning upon how a person conceives of his or her relationship to the social and physical world. Having a sense of place means achieving knowledge of the inhabited world, from many perspectives, for the sake of bettering self and society, for the sake of equity.

“Responsibility” as the foundation for constructing curriculum from the perspective of place contrasts with “measurable achievement” in well-defined domains as the starting point. Indeed, one need not preclude the other, but zeal in the pursuit of the latter readily stealthily preempts the former. Furthermore, essential to responsibility in this context is a sense of reciprocity—an equitable sharing of individual responsibilities to the community and of community resources with the individual. Everyone profits from cultural heritages and natural resources not of their own making and therefore incurs the responsibility to reciprocate.

According to Robin Wall Kimmerer (2003), the sense of equity embedded in this reciprocity with place matches educational aims associated with indigenous ways of knowing “rooted in intimacy with a local landscape where the land itself is the teacher” (p. 101). From this perspective education is a process of realizing the gifts we bring to the aim of caring for each other. Attentiveness to local surroundings, to one’s role within those surroundings, and to the achievement of attachment to place and community, brings progress toward this aim.

Steven Semken (2005) also acknowledges the “expert” sense of place often held by indigenous peoples of the southwest, the result of long association with a landscape fostering an emotional attachment that combines meaning and feeling. West’s (1995) fascinating history of the short-grass prairie contrasts the theme of attachment and meaning in recent

literature by indigenous authors with responses to new lands expressed by European immigrants. In brief, West finds a recurring theme of starting over, new beginnings, of escape from the past in the journals and literature of settlers. Pioneers ventured west to find opportunity and reinvent themselves.

On the other hand, indigenous authors, according to West, express how, following dispossession, returning to ancestral lands proves restorative. Seeking a new identity thus contrasts with restoring an ancient one, both aims attached to, in many cases, the same place. Stories differ. “A place is what it is, partly, because of the deep strata of stories that are still being laid down, and will continue to be, presumably forever” (West, 1995, p. 150).

Recent writers, descended from early settlers and now third- and fourth-generation occupants of the land, argues West, speak in voices more similar to those of indigenous authors than to those of their own ancestors. From all three perspectives, we learn that place renews, that place associates with recovering and maintaining strength, that place attaches with meaning to the lives stories tell, that the paths to *querencia* are multiple.

The politics of standards and accountability, often silent on the topic of place apart from a genre of literature, presume that promoting individual competitiveness best serves the common good. Deliberate concern for social good and community well-being—whether conceived as democratic access to power or sustainable use of natural resources—plays second fiddle to making certain that each student acquires, in the context of fair competition, the knowledge, skills, and dispositions needed to survive, if not thrive, in society.

Standards are for all to achieve in common across all schools are not derived according to the circumstances of place and landscape. Standards-based schooling (1) assigns to the student the responsibility to learn study habits and assimilate competitive ethics and (2) demands that teachers often implement narrowly focused, highly prescriptive lessons (Norman & Ault, 2008). The movement to implement standards for learning subject by subject (for the sciences, see National Research Council, 1996) invites top-down, authoritarian management. In its most lamentable form, authoritarian schooling reinforces “ductile and docile” (Dewey, 1990, p. 186) behavior—less-than-ideal traits for democratic living.

In contrast, the sense of reciprocity found in husbanding resources and contributing to the life of a community, vital to responsible living in a democratic society, enhances the ideal of equity. Neither sense of equity—competitive or reciprocal—in the absence of the other holds sufficient social promise. Discrimination, prejudice, and class barriers to resource access must, of course, be overcome for each and every individual. However, the promise of “equal opportunity” to a community set amidst a landscape lacking regenerative capacity is no more than the fading, mocking grin of the Cheshire Cat.

How might curriculum design reconcile competitive equity with social responsibility? As an approach to reforming schools, “place-based” educators (Gruenewald & Smith, 2008; Haymes, 1995; Lanza, 2005; Senechal, 2008; Smith, 2002, 2007a; Sobel, 2004) derive a conception of equity from the starting point of responsibility (rather than competition). Reciprocity and responsibility differ from, yet must contribute to, aims of equal opportunity and competitive skill. Using “attachment with meaning” to pilot this journey may transform the political agenda of schooling itself (Gruenewald, 2003b). The idea of place responds to omission in standards-based curricula of deliberate effort to build sustainable, just communities. Conceptions of place and landscape have the potential to rescue students from detachment and curriculum from isolation. Equally importantly, these conceptions help us to imagine how to promote a culture of responsibility over one of competition while rediscovering the meaning of public education’s most fundamental value, equity.

### **The Call to Take Up Residence in a Place**

Persons and groups may vary in the degree of attachment and type of meaning that constitute their sense of place and they differ, of course, in the significance they ascribe to place (Gruenewald, 2003a). A given place may hold sacred meaning for some while being a marketable commodity to others. Place sustains identity, community, and economic security through generations. A sense of place constrains the ways in which markets may exploit the land and its community of people and encourages citizens to assume responsibility spanning generations.

Ultimately, the logic of market competition and investment return may contravene the value of public education, should private education clearly demonstrate a superior, more efficient means of achieving the goals of individual and national economic competitiveness. The perception that returns on the investment in education accrue primarily to the individual reinforce arguments for reducing the share, for example, of public funding of higher education and increasing the cost borne by students, often in the form of debt. These are consequences logically consistent with achieving competitive equity; less so, with reciprocal equity.

Instead of competition among individuals, place-based schooling strives to engage students in collaborative work on behalf of and in partnership with their communities. The idea of place in curriculum design promotes complex achievements in cooperation with others. Just as Barry Lopez calls for the rediscovery (and redefinition) of the wealth of a continent, the attention to place, as both community and landscape, calls for the rediscovery (and redefinition) of curriculum.

*The Voice of Barry Lopez.* Stories of place and inquiries about landscapes—whether ecological, historical, geographical, cultural, or geological—



contribute to the growth of experience while achieving community ties. Through understanding connections to place, there should follow commitment to the betterment of place and to the strengthening of self (Tisdale, 1991). As introduced at the outset, a word proposed to encapsulate this vision of curriculum is *querencia*. According to Lopez (1992), the origin of the term is in reference to the place of safety in the bullring where the wounded beast goes to recover its strength.

Lopez, in his essay on the tragic entry of Spain into the New World, *The Rediscovery of North America*, calls upon citizens to redefine wealth, to acknowledge loss of nature and culture due to misguided economic ideology, and to become, as were those who were conquered, true residents. Lopez's call for rediscovery and residency is telling; it is a call for understanding the value of an intimate relationship with place. Ultimately, *querencia* challenges modern, mobile, competitive, consumer culture to rediscover an indigenous sense of place, a sense of place bound to long-term commitment. For Lopez, the call to take up residence in a place is central to the task of redeeming the history of imperialism and its exploitation of the continent—and to securing a just, sustainable future.

The true wealth that America offered, wealth that could turn exploitation into residency, greed into harmony, was to come from one thing—the cultivation and achievement of local knowledge. (Lopez, 1992, p. 23)

How then, do we come to know the land, to discover what more may be there than merchantable timber, grazeable prairie, recoverable ores, damable water, netable fish? It is by looking upon the land not as its possessor but as a companion. To achieve this, one must I think cultivate intimacy, as one would with a human being. And that would mean being in a place, taking up residence in a place. (Lopez, 1992, p. 32)

Lopez's words eloquently embody the idea of place-based education. His call to cultivate local knowledge and take up residence illustrates how place-based education proceeds. States, of course, do not measure whether citizens are achieving "residence" through schooling. Nevertheless, Lopez's idea of *querencia* and Dewey's vision of democratic living, may inspire a rediscovery of educational aims. Engagement with place, as espoused by Lopez, becomes an "intelligent conversation" in pursuit of local knowledge:

When we enter the landscape to learn something, we are obligated, I think, to pay attention rather than constantly to pose questions. To approach the land as we would a person, by opening an intelligent conversation. And to stay in one place, to make of the one, long observation a fully dilated experience. We will always be rewarded if we give the land credit for more than we imagine. . . . In these ways we begin, I think, to find a home, to sense how to fit a place. (Lopez, 1992, pp. 36–37)

Embedding learning within local landscapes prefigures a very different approach to curriculum than prompted by the standards-based mind-set. Seeking a sense of place means to cultivate local knowledge and to find in

local knowledge its significant links to broader understanding. Approaching curriculum from the perspective of place prioritizes community over competition, asking students to find a role for their talents in the context of promoting the common good, this common good being, in essence, the equitable, democratic living espoused by Dewey.

*The Career of Neal Maine.* Neal Maine taught both fourth-grade and high school biology to students from Oregon's northern coastal communities. Raised in Clatsop County, he never left. Instead, he brought attention to his community and taught generations of students to value its beauty. Maine took up residence, as called for by Barry Lopez. He also coached the Seaside High School football team. From teaching, Maine moved on to become a district science supervisor, state-appointed coordinator for a natural resources curriculum, and recipient of an Annenberg Foundation Rural Challenge grant. He worked with teachers on curriculum anchored to local themes and now devotes his energy to stewardship as director of the North Coast Land Conservancy and the establishment of a new interpretive center.

Across from Seaside High School stands testimony to his legacy: a viewing deck and estuary access. From this access point, thousands of students have conducted inquiries about the Necanicum River and estuary, the Seaside bar, and the local intertidal zone—censusing ghost shrimp, mapping barnacle encrustations, measuring the range of salt-tolerant sedges.

One high school group applied their trigonometry skills to the hazards of tsunamis to determine areas of risk and pathways for evacuation. An elementary school worked with a contractor who needed to mitigate wetlands loss—they now have a stable freshwater wetlands adjacent to their school. In another project, students investigated the buying habits of their peers who often went to Portland to shop, then shared this information with local merchants. Other classrooms have studied how to make playgrounds more attractive to very young children and to promote the display of school art in public places.

Maine now works to conserve key components of coastal ecosystems not only for intrinsic reasons, but also as investments in the long-term appeal of Clatsop County as a tourist destination and sustainable community. In addition, working with volunteers after school and during vacations, he has organized interpretive programs along the Oregon coast. Such volunteers have even kept records of dead Common Murres washing ashore on local beaches, noting several years ago that a spike in adult mortality had signaled something was amiss at sea—an oil spill that even the Coast Guard, for a time, had missed.

The point of curriculum, argues Maine, is to gain access to resources for interacting and participating in our world, to achieving empowerment as citizens even when a child. Six-year-olds can advise librarians, for example,

on what a library might do to entice children to enter and remain or how a playground might be planned to please both their younger and older siblings. After all, children are residents as well as citizens.

Maine and other proponents of the importance of place and community to pedagogy strive “to make the boundaries between schools and their environs more permeable by directing at least part of students’ school experiences to local phenomenon ranging from culture and politics to environmental concerns and the economy” (Smith, 2007a, p. 189). In such schools, students deepen their connection to place, enhance their aesthetic appreciation of the local landscape, and acquire insight into what is worth preserving. They achieve these goals by investigating culture and history, monitoring and restoring the environment, advocating and practicing conservation, engaging in public processes, and tending to real-world problems and commerce (Smith, 2002; Smith & Williams, 1999).

Most importantly, as Maine never fails to remind, children are citizens; schooling is not a drawn-out apprenticeship with the reward of citizenship at its end. Adults may have rights that children lack (such as voting), but being 10 or 15 years old does not disqualify a person from citizenship. The concept of the citizen—and of the aim of educating people for productive lives of social responsibility in a democratically governed society—invigorates public education. The concept of the citizen is key to taking up residency. It widens, not narrows, the scope of education and deepens its rightful claim to public investment on behalf of community good in the name of equity.

### **COHERENCE AND DISCIPLINE FROM THE PERSPECTIVE OF PLACE**

In keeping with an Emersonian notion of transcendence, in place-based education the particular bears witness to the universal, as also accomplished by an “artistically crafted work” (Eisner, 1998, p. 152). People act where they live, in a place, not elsewhere, yet their actions carry implications beyond their own communities (Gruenewald, 2006). The stories of their actions connect places, suggesting an appealing coherence felt missing in the study of a discipline—a coherence of thinking, feeling, belonging, and acting in personal and social life. Disciplines cohere in other ways of high value, generally in response to aims of problem solving that the study of place must respect.

Inquiries into the stories of place often require thinking disciplined by traditional subjects. Place supplies the context, disciplines the tools. A curriculum from the perspective of place has high merit in terms of integrating learning. Upon closer inspection, the very real hazard of fragmentation appears for the citizens of Seaside on the Oregon coast, rightly concerned about their tourist economy and the hazards of tsunamis.

Learning about the local economy and local geologic hazards has appeal, but its pursuit may come at a price: chaotic organization or fragmentation of traditional subjects. To learn about the coast means to learn a modest slice of biology, a sampling of geography, a touch of literature and art, a few math skills in an applied context, and a small portion of economics and history. Fragments of knowledge from many fields and expertise in none cannot resolve long-standing inequities or solve intractable problems. Fragmentation serves neither community good nor individual competitiveness.

The place-based approach promises to promote public service, foster civic action, and achieve curricular integration. At the same time, it carries the potential for corresponding liabilities: an excessive zeal for community service at the expense of academic learning, the temptation of partisan political advocacy in a public school setting, and the risk of fragmenting subject knowledge.

Recall the twofold framing of the challenge to place as a focal point of curriculum design: (1) the need to honor equity and (2) incorporate subject knowledge with integrity. Thus far, I have juxtaposed reciprocal equity with competitive equity and found place-based education a means to achieving the former while not discounting the latter. A liability remains for the place-based approach to address: cursory attention to disciplined thinking (in the sense of “disciplined mind” developed by Gardner [1999]) in traditional subjects. There are risks entailed by a commitment to a place-based approach given a public (and political leadership) concerned about closing gaps in academic achievement.

### **The Problem of Divergent Purposes**

I have tried to show in brief fashion how place may reconfigure and enhance the meaning of equity in ways of value to democratic living. The next task is to suggest how to begin to “recontextualize and restructure” disciplinary knowledge in alignment with place-based aims. The potential for conflict stems from divergence of purpose, and, in keeping with divergent purposes, different forms of coherence. Just as *querencia* informed the discussion of reciprocal equity, so, too, do I propose to integrate disciplined thinking with place in terms of *querencia*.

First, I acknowledge John Dewey’s conclusion that children’s thinking and disciplinary knowledge represent different stages in the development of experience along a continuum. At different stages, experiences integrate in different ways. For the expert, knowledge serves as a resource for solving particular kinds of problems where criteria of logical consistency and adequacy apply. For the child, knowledge serves immediate ends where criteria of interest and emotional satisfaction apply. Even the ends of the continuum are not mutually exclusive, of course; children are capable of acknowledging illogic (they enjoy whimsy in children’s literature, for example) and adults, of seeking intellectual satisfaction.

Scaffolding between the realm of experience meaningful to the child and the problem-solving resources of the expert depends in large measure upon the child being able to understand the explanatory goals of a discipline. The child likely does not share, grasp, or depend upon these purposes. Clearly, problems of great theoretical significance to a scientist may have no consequence to a middle school student; intricacies of orchid pollination may fascinate a botanist, but bore a 15-year-old. Disciplinary context may feel sterile and isolated, even arcane and arbitrary, to the novice with no appreciation for how theory and anomaly set the cognitive agendas of the disciplines. Adolescent and child learners do not share in these agendas. They do wonder about dinosaurs and do tend to explore the places where they live; hence place holds appeal as an instructional method promoting learner engagement. Yet place and achieving *querencia* may call for something more enduring: commitment to civic action as an adult based upon interests and habits acquired during childhood, the story at the end of this essay of the allosaurus under a child's bed and the preservation of the Purgatory River region in Colorado being a case in point.

Concern for place further complicates the progression of the child's development along Dewey's continuum and its dependence upon the recognition of purpose as established by a discipline. Achieving shared purpose assumes good reason for doing so—that subjects, in themselves, offer sufficient direction for the development of experience. From the perspective of place and reciprocal equity, they often do not.

The place approach questions the very worth of achieving shared purpose anchored to the cognitive agendas of the disciplines. Why do adolescents need to understand chemical bonding in an intellectually sound manner, as respected by experts seeking solutions to problems of chemical engineering? Is a worldview at stake regarding the nature of the material universe or merely a set of conventions for ordering our experience of the material world in technologically productive ways? Whatever the answers, at issue is the purpose of knowledge—and whose purposes. Does knowledge serve the purposes of the learner? Does the learning, widely shared, serve the interests of the community? Promoting “equal opportunity” (college admission, career choice) justifies discipline-dominated enterprise. A shift in emphasis to reciprocal equity challenges this dominance.

Concern for attachment to place with meaning calls for the recontextualization, and in many ways the restructuring, of knowledge for a distinctive purpose, not necessarily shared by discipline experts: achieving *querencia*. The method of instruction, although not exclusive of solving problems discipline by discipline, prioritizes the conduct of inquiry into local stories. The outcomes are interpretations of the local landscape, literally and metaphorically. The place approach cultivates an intimate appreciation for local knowledge for the sake of transforming the learner and the

community into a sustaining, reciprocal relationship. Responsibility counts: collaboration happens. Beauty matters.

The aims of place-based education appear to part company with traditional standards of academic achievement; seeking place and mastering discipline conform to different goals. The path that reunites them follows from concern for coherence, a concern common to both perspectives, and an understanding of aims superordinate to the study of places and disciplines.

### **Types of Coherence**

Meaningful learning from the perspectives of both place and discipline depends upon coherence. Coherence may differ in type; reconciling place with discipline therefore depends upon sorting through types of coherence. Epistemological coherence (logically structured knowledge within a discipline) differs from experiential coherence (personally organized meanings within a social context), for example. From a different perspective, coherence may exist emotionally or cognitively. Place and discipline conflict when they fail to acknowledge different forms of coherence, when subject coherence appears sacrificed on the one hand or personal meaning on the other.

From an emotional point of view linked to cognition, coherence stems from a sense of satisfaction that one's knowledge is adequate to the problem, that understanding is practical, that the effort to learn will prove productive. Such wide-awakeness to one's own thinking attaches emotion to the improvement of understanding. Revisiting this place in the mind to gather strength achieves *querencia*; knowing the self in this manner grounds character and confidence in getting smarter is analogous to recovering strength. *Querencia* as a sense of place in the mind promotes a conception of self in control of learning and a belief that intelligence improves incrementally (cf. Dweck, 2000).

What a curriculum ought therefore to achieve is *querencia* in two senses: attachment to place and satisfaction with thinking. Through the lens of *querencia*, the goals of learning from the perspectives of place and discipline converge. Learning demands coherence from both place and discipline, in both cognitive and affective respects.

***Epistemological and Cognitive Coherence.*** Within a subject, in the epistemological sense espoused by Dewey, coherence refers to connecting what we know to how we know it. "We need to help students understand the variety of methods and techniques that scientists use to explore the diverse phenomena in the world—that is, the process of knowledge construction as it's actually practiced (in all its localized instances) rather than the facile stereotype of some non-existent, singular scientific method" (Rudolph,

2007, p. 3). That is the view that accompanies moving along Dewey's continuum of development—or along continua pertaining to “diverse phenomena.” Place, however, calls for a different trajectory with implications for both self and subject.

***Experiential and Emotional Coherence.*** Within the mind, coherence refers to the sense of self. Through a relationship with place (attachment with meaning), the self finds identity. Furthermore, cognition and affect may combine as a delicious taste for learning—a place in one's understanding returned to for strength and recovery in the face of troubling confusions and the demands of problem solving.

In the cognitive sense, coherence refers to appreciation of the synergistic relationship between inference and observation, between discovering “more about the world while simultaneously learning how to investigate the world” (Kitcher, 1993, p. 202). Despite its ambitions, this sense of coherence suffers limitations from the perspective of place. Place places inquiry within a wider social and political context—a context of value that subsumes as it depends upon disciplined thinking. The wider context achieves coherence not in terms of the correspondence between investigative method and explanatory aim, but rather in terms of the integration of experience by a self in relationship to a community and its landscape.

***Querencia and Coherence.*** The two types of coherence, in simplest terms, are “making sense” and “sense of place.” In combination, they achieve *querencia*. Education that achieves coherence in both senses matters greatly. Both yield feelings of significant attachment that enhance personal identity and encourage community membership. Coherence found in disciplined thinking yields a fondness for trusted ideas. Coherence found in acting to steward landscapes and build community makes knowledge a valued companion. Coherence is a source of strength, the key to knowing one's beliefs in the deepest sense.

### **Preserving Disciplined Thinking in the Context of Place**

The antidote to cursory learning is disciplined thinking. Disciplined thinking arises from engineering investigative procedures adapted to the characteristics of particular problems. However, due to the failure of students to share in the cognitive agendas of disciplines, schools tend to present knowledge as isolated subjects demanding immense efforts of memorization (Gardner, 1999). School subjects thus trivialize the heritage of academic inquiry. A sense of place, on the other hand, offers respite: an opportunity for engagement, problem solving, and membership. By virtue of offering a context that integrates learning experiences, place may restore vitality and purpose to disciplined thinking.

Place ought to subsume disciplined thinking because its forms of coherence amplify understandings essential to democratic living and sustainable society. Moreover, protocols and knowledge for solving problems subject by subject often prove useful in the context of inquiries into local stories and interpretations of local landscapes. Place provides both context and aims that center on the interpretation of experience and understanding of self from the perspective of membership in a community. Disciplines are also communities—communities with resources for cultivating local knowledge and achieving a sense of place. Ultimately, membership in a discipline requires apprenticeship to a community of practice. For place, this community of practice is Dewey's democratic living.

In subsuming disciplines, the place approach ought to honor the principle of "membership through practice and apprenticeship." Disciplines, as resources for solving problems, feature specific "protocols" or techniques of inquiry. Field ecologists, for example, have developed protocols for quantifying species diversity within an area. Insect ecologists master techniques for sampling organisms in soils and streams. These protocols are not generic processes independent of context; they are methods adapted to the characteristics of particular problems—a feature of disciplined thinking oversimplified as the "inquiry process" or the "fundamental concepts and processes of science" in national standards documents (National Research Council, 1996). As place subsumes discipline, careful attention must be given to preserve the relationship between the protocol and the problem, with the problem recast as pertinent to place.

Still, care must be given to the difficulty of understanding the explanatory ideals of disciplinary experts and to the independence from these ideals of the aims of place-based education. Bodies of knowledge well understood can and do function as a liberating heritage for citizens in a democracy. Disciplined thinking empowers people. If a place approach to schooling fails to lead in this direction, the place approach will fail, no matter how compelling its ideology of reciprocal equity may seem. The sought-after integration is one that preserves key aspects of disciplined knowledge and promotes the healthy growth of identity. Recognition of the "protocol-problem" relationship is one key step toward this integration, a first step leading to insights about connections between methodology and conceptualization in general. As these connections build, pleasant feelings emerge to become the emotional aspect of understanding.

By recognizing the emotional aspect of understanding and the anchorage of such emotion in the experience of coherence, *querencia* offers to reconcile place with discipline. Place, furthermore, provides a purposeful context that differs from disciplinary agendas yet depends on the resources of disciplines in order to progress. What, then, to preserve of subjects in a place-based curriculum? What makes a discipline a discipline? Simplifying subjects as generic processes (observe, infer, classify, draw logical conclusions) will not suffice. The key word in answer to these questions is



“structure.” When transferring and translating disciplined thinking from the context of original inquiry into school subjects, preserve crucial elements of “structure” and let go of large amounts of information.

Examining the relationship between claims and methods, between how to solve problems and the solutions to problems, uncovers structure. Structure may refer to aims, questions, concepts, events, and claims (Gowin, 1981). Questions point to events of interest; concepts frame the questions. Claims answer the questions; methods record events and transform these records according to aims. Subsuming a discipline while preserving structure means making its centrally organizing concepts, events of interest, explanatory aims, methods of inquiry, and most valued claims clearly evident. The worth and meaning of ideas should remain important while the recall of facts and skills recedes.

Disciplines require structure to conduct inquiry that might withstand skeptical scrutiny (Gowin, 1981; Gowin & Alvarez, 2005). Disciplines provide the mind with structured approaches to thinking. Disciplines construct conceptions of phenomena of interest. The conception—an orderly array of categories of thought—directs attention, guides choices, and suggests how to proceed. “On the conception, all else depends,” argued Joseph Schwab (1962, p. 198). In wetlands and in response to inquiry into the local story, hydrologists seek to know where water will go, botanists to understand how plant communities will respond to soggy ground, ornithologists to learn how to position nest boxes, climate researchers to measure how carbon dioxide levels change over time in the ecosystem. A conception of the phenomenon of interest guides each inquiry, from the selection of methods to the framing of questions.

Different fields not only differ because they concern themselves with different phenomena and hence have constructed distinctive conceptions, but they also hold distinctly different explanatory ideals (Toulmin, 1972) deployed according to the subject’s distinctive “cognitive agenda” (Kitcher, 1993). As Stephen Toulmin has stated in *Cosmopolis* (1990), each discipline invents methods responsive to the demands characteristic of a particular set of problems. Place rightly subsumes disciplines when careful to preserve the diversity of their structures, the distinctiveness of their cognitive agendas, and the characteristics of their respective problems. Examples from geology, medicine, and climatology follow to illustrate this point.

***Mount St. Helens.*** Geologists witnessed in the 1980 eruption of Mount St. Helens, for example, not an experiment but an opportunity to invoke a principle of geologic thought: substitute place for time to infer sequences of events across vast spans of time (Ault, 1998; Gould, 1986). One volcano’s form, through the lens of place substituting for time, stands as an example of another’s past; yet another suggests a future stage of development. Volcanoes of different age dotting a landscape comprise a sampling distribution of changes unfolding in geologic time. Human history affords

regular glimpses of these changes, but not the opportunity to observe the stages of a single volcano over tens of thousands of years.

The 20<sup>th</sup>-century eruption of Mount St. Helens prompted volcanologists to revise their knowledge of how continental arc volcanoes change. They learned that the craggy look, a result of lateral explosion and massive slope failure, may come early in the sequence, not only later, as previously supposed. Youthful-stage volcanoes may be conically symmetrical or deeply dissected.

The sudden disfigurement of a youthful volcano prompted revision of the interpretation of volcanic landscapes around the globe. However, the aim of extrapolation across immense spans of time (the cognitive agenda) did not change, nor did the principle “substitute place for time” (a method of inquiry).

The disciplined study of the eruptive history of Mount St. Helens has virtually no bounds; the inclusion of geologic inquiry from the perspective of place certainly does. The explanatory ideal of extrapolating across vast spans of time invokes the principle of place substituting for time. The satisfaction found in reading the landscape, in seeing through time, when these ideas are well understood is palpable: a harbinger of the achievement of *querencia*.

***Double-Blinding.*** In medicine, researchers may invoke the protocol of a double-blind study with random assignment of patients to treatment or placebo. The explanatory ideal is to determine the efficacy (and safety) of the treatment, asking, “Does the treatment stop the cancer without harming the patient?” Randomized assignment to treatment is a criterion of excellent medical research—a protocol best understood in relation to the concept (and problem) of human variability. Biomedical research design must wrestle with this variability and one technique is to neutralize, through randomization, contributions from many, uncontrolled factors to ascertain the effects of just one. Results may overturn prior wisdom, as learned through the Women’s Health Initiative (2006).

For many years, in answer to the question, “Is estrogen therapy in postmenopausal women a good idea?” doctors prescribed estrogen to women in the belief that it would protect them from heart disease. Work with animal models suggested this beneficial effect. Results of a 15-year study by the National Institutes of Health involving tens of thousands of women, generated data that brought this practice into question (Women’s Health Initiative, 2006). Estrogen did prevent cardiac events but only after increasing the risk of thrombosis (blood clots) during the first 2 years of therapy. These risks, for many women, exceed the benefits and hence doctors in many cases reversed their clinical advice.

Again, when subsuming disciplines by place, there arises the question of what to preserve and the protocol-problem relationship is a place to look. Random sampling and human variation, aspects of methodology and

conceptualization, respectively, bubble to the surface. In many communities, inquiry into local stories may mean delving into health issues. Whether urban planning for more pedestrian friendliness, the ethics of obtaining human volunteers for clinical research, lobbying for changes in school lunch policies, or justification for animal models in medical science, the design of inquiry must address problems of sampling and variability. A visceral feeling of significance attaches to medical science; fear and anxiety accompany the subject as well. There seems no escape from the emotional content of understandings of health.

**Global Warming.** When the patient is the earth and the treatment is the carbon-based global economy, there is only one subject in the study. Has the earth cooled or warmed rapidly during the Holocene epoch? On what other scales? The protocol of double-blind, random assignment (with sufficient participants to meet statistical challenges to outcomes) does not fit.

In research about climate change, scientists look for synchronous signals: spikes in oxygen isotope ratios from coral reef carbonates and lake bed sediments. The protocols for inferring trends in global temperature through mathematical modeling differ from the protocols for managing variability among human subjects in an experimental design. Inferring climate trends from the onset of diapause—a dormant stage entered over winter—among mosquitoes introduces its own set of protocols.

At the University of Oregon, two evolutionary biologists, William Bradshaw and Christina Holzapfel, have studied a species of mosquito that conveniently needs no blood meal: *Wyeomyia smithii* (Kolbert, 2006). This mosquito completes much of its life cycle within the carnivorous purple pitcher plant (*Sarracenia purpurea*). After several generations, the time for diapause arrives: The metabolism of these insects in their aquatic, larval stage changes so that the bugs can survive freezing temperatures.

How do these mosquitoes know when to stop cycling between egg and adult and enter diapause? How do they know when to wake up? The signal they depend upon is the length of day. Switching diapause on and off in this species of mosquito is automatic and dependent upon a genetic program. They have built-in timers, set to ring based on a critical photoperiod.

Bradshaw and Holzapfel had serendipitously collected these mosquitoes and measured the critical photoperiod for inducing diapause in populations from locations in Florida to Maine—and had done so for some sites first in 1972. By 1996, they had, thanks to a serendipitously useful protocol, critical photoperiod data for populations at different latitudes during different decades. For example, Horse Cove wetland, North Carolina, 1972: 14 hours and 21 minutes. In 1996, 13 hours and 53 minutes—nearly a half-hour difference—meaning the mosquitoes could remain active days longer into the fall, waiting for shorter days before packing it in for the winter.

At 50 degrees latitude, the decline reached more than 35 minutes—delaying diapause for nearly 9 days. Bradshaw and Holzapfel had demonstrated genetic change induced by a warming climate—how natural selection reset the mosquito’s clock, and thus they became, to quote Elizabeth Kolbert (2006), “the first researchers to document [that] global warming had begun to drive evolution” (p. 80).

Such science suggests a direction for rethinking education in a warming world. It implies the value of paying attention to the astonishing details of one’s own surroundings, to listening for the songs of change, whether cacophonous or harmonious, in the back yard. With respect for rigor, the novice and the amateur might come upon important patterns, both finding significance and taking delight—and achieving *querencia*.

***Disciplining the Capacity to Adapt.*** Methods and concepts for extrapolating on geologic scales, discovering the causes of disease, and modeling climate with mathematical structures present opportunities for introducing disciplined thinking into the study of place—of geologic landforms, public health, and global warming. There are important features of the structure of knowledge in each context to preserve. Most importantly, the context of place prioritizes knowledge that contributes to sustainable living—even survival in the face of severe threats to community well-being. Geologic hazards, ecological degradation, epidemics of nutritionally related diseases, economic disruption, and climate changes happen to places; they impact locally and require an ideological shift in educational aims: away from individual competitiveness and in favor of the capacity of the community to understand, and potentially influence, its changing circumstances. In short, its capacity to adapt. This capacity to adapt depends upon directing the power of disciplined thinking toward the ends of achieving a sense of place, of membership in the local community, and of understanding that feels satisfying.

### **Avoiding the Temptation to Preserve Disciplined Thinking as Generic Processes**

Traditional curriculum design often distinguishes between “content” and “process.” The process approach emphasizes the production of knowledge; content, its expression. Whether about inquiry in natural science, social science, or even philosophy, lists of processes presumably apply across many subject fields. Typical processes of science are “observe, infer, predict, classify, organize and interpret data, communicate findings, design experiments, control variables,” and so forth. Their focus on demonstrable skills, independence from subjects, and tangible definitions (examples come easily to mind), make processes seductive—something tempting to preserve when subsuming a discipline by place. Who can oppose teaching

students the value of “reliable prediction” as a criterion of science? Such rhetoric is compelling, at least on the surface. The study of place would be well advised, however, to avoid this temptation; processes, like methods and protocols, do not readily detach from context or concept.

Consider the process of “prediction,” the poster child (inference’s offspring) of generic processes, in two different disciplines. At first glance, it would seem that all scientific disciplines are equally concerned with making reliable predictions, thus making “reliable prediction” a good criterion for judging the worth of an explanation. However, upon reflection, the predictions of evolutionary biology seem somehow different in a cognitively significant way from those of physical chemistry. The biologist typically casts a prediction of extinction for a species in the probabilistic terms of a forecast using language such as “With a high level of confidence, we believe that species A has a 50% chance of escaping extinction over the next century if the range and quality of its present habitat remain unchanged.” There is uncertainty in the prediction as well as ambiguity in what “unchanged habitats” might mean.

The chemist, on the other hand, can predict with accuracy what new substances will form as chemical changes take place given the starting conditions and substances. The chemist uses this knowledge to form substances with desired properties from substances with well-known, yet different, properties. Chemists calculate the rate, extent, and products of reactions with precision. A chemist typically casts a prediction in language such as “One mole (a large number of atoms) of sodium, an explosive metal at room temperature in its pure state if mixed with water, will combine with 1 mole of chlorine (the same large number of atoms as of sodium), a toxic gas at room temperature in its pure state, to yield 1 mole (the same large number again, this time of sodium-chlorine pairs) of sodium chloride, commonly known as table salt, which readily dissolves in water up to a limit, dependent upon the temperature of the water.”

The nature of prediction varies between these two disciplines because the imagery guiding thinking differs. Imagery adapts to the distinctiveness of phenomena of interest, to the demands characteristic of different problems (the imagery of substituting place for time functioned in this manner in a previous example). For example, evolutionists express their understanding of shared common ancestry among organisms (or divergence from an inferred common ancestor) with the imagery of branching diagrams. Chemists express their understanding of the reactive properties of elements (as well as physical properties such as mass) with the imagery (rows and columns) of the periodic table. Tables represent cycles; trees, contingencies.

The imagery of branching as presented by Darwin, likely based on the branching growth pattern of a coral-like algae (Bredercamp, 2005, cited in Maderspacher, 2006), and the very different imagery of periodicity, derived from the ratios of combining weights of different substances to form new

compounds, guide thinking in two distinct domains. These domains are populated with different kinds of events: reproductive events among organisms and reactive events among elements. Concepts signifying uniqueness characterize organisms (e.g., the “genome” of species); concepts signifying universality (e.g., the “valence state” of atoms) characterize reactants. Concepts derive meaning first by virtue of their reference to some events and not others (concepts impose boundaries) and by virtue of their use in relation to other concepts. Distinctive imagery, relationships among particular concepts, and characteristic forms of representing data constitute, in part, the idea that knowledge has a structure to grasp (Gowin, 1981; Gowin & Alvarez, 2005; Schwab, 1962). Having grasped structure, the mind may enjoy the thinking of biological (or chemical or mathematical or historical) thoughts, often returning to this place of satisfaction.

In attempting to avoid fragmented and cursory coverage of traditional subjects, place-based educators should not yield to the temptation to substitute training in general inquiry or process skills for thinking disciplined by subject. Excessive embrace of science as universal processes or methods, at the expense of attention to distinctive features of disciplines, is a hazard to avoid (Ault, 1998; Orion & Ault, 2007). Instead, place-based educators ought to attend to the distinctive imagery for expressing ideas and the characteristic forms for representing data in fields of study with high potential to enrich a sense of place. In some fields, such as geology, the imagery guiding thinking and the phenomena of interest themselves are inherently bound to place—to inferring the history of a local or regional landscape, for example. In others, the phenomena of interest have immediate consequences for a place, such as climatology and global warming. Even disciplines aspiring to universal significance, such as chemistry, or personal relevance for all, such as medicine, have substantial resources to offer the study of place; there is no place independent of chemical interactions and no one unaffected by public health.

In each of these disciplines (and any other chosen for analysis), key aspects of structure merit preservation as the search for coherence through a sense of place subsumes them. There are concepts central to the organization of thought, protocols responsive to the nature of problems, and explanatory ideals vital to the agenda of the discipline. Distinctive imagery in each field unites these elements: the imagery of deep time, gold standard, biological clock, branching coral (or tree), and periodicity. Imagery exercises the imagination and powers inference; revisiting imagery and grasping how it underwrites thinking contributes to achieving *querencia*.

Place-based enthusiasts must be careful, as must all integrative educators, to treat disciplines as more than sources of information. They are disciplined ways of thinking appropriate to solving particular problems. Disciplinary structures do overlap in many ways; nevertheless, to substitute an umbrella of common processes for thinking disciplined by context would be unwise. Disciplines are good sources of telling questions,

questions framed in terms of concepts that embody prior knowledge of the object of inquiry. Attributes of disciplinary study empower the learner to make sense of disparate phenomena, to converse, by virtue of achieving shared conceptual structures, with many other educated minds, and to strive for improved understanding. A disciplined mind is a satisfying feeling, an intellectual place to revisit, offering revitalization and connection with others.

The disciplined mind informs conversations with the landscape toward the end of achieving *querencia*. In both disciplined thinking and sense of place, the imagery of *querencia* applies: to the external environment, the sense of place as residence found restorative and reinvigorating, and to the internal environment, the sense of self as a thinker found hopeful and revitalizing. There is joy in finding the places in the mind where understanding satisfies. This satisfaction in the things learned well, this recognition of the capacity to use knowledge to solve problems, is a vital form of *querencia*: a habit of returning to the understandings most deeply trusted to gather strength to learn more. Adrift from authentic academic authority, place-based educators risk engagement in political power struggles that they will lose if their approach neglects the structure of the disciplines. Ideally, place and discipline cohere as intimate connection with landscape and satisfying understanding of subject, as the achievement of *querencia*.

### **Landscape Art and the Transformation of Disciplined Thinking**

The study of place invokes the criteria of artistry. “What artistically crafted work does is to create a paradox of revealing what is universal by examining what is particular” (Eisner, 1998, p. 152). Eisner (1998) enumerates other dimensions of artistic expression that pertain equally well to the study of place:

First works of art make the obscure vivid and make empathy possible. Second, they direct our attention to individuality and locate in the particular what is general or universal. Third, they possess a sense of wholeness, a coherence, a kind of organic unity that makes both aesthetic experience and credibility possible. (p. 152)

In place-based education, the local story unveils, thread by thread, a pattern of meanings connected to the rest of the world. “Coherence, imagery, and particularity are the fruits of artistic thinking” (p. 154). Indeed, coherence, imagery, and particularity are the hallmarks of disciplined thinking as well as a sense of place.

Eisner continues with these themes of coherence and organic unity to find in the works of many other disciplines the qualities he values in works of art. Art, for example, frames a subject and distills perception to yield a

particular experience. Analogously, argues Eisner, in order to make inquiry feasible, the investigator must exercise, as does the artist, “constructive neglect” (p. 153). Some features of the landscape are neglected to discover truths about others.

Scientists must decide what to neglect when designing an experiment; their conception of the phenomenon of interest functions as does “constructive neglect” in art by imposing categories of thought. The form chosen to represent the data (table, tree, map, or equation) captures features of reality from one perspective while omitting others, as do various traditions of art. The coherence of scientific theory connects observations of the particular to wider contexts. Facts “make the obscure vivid” as do works of art. In summary, Eisner’s criteria of artistry work well as aims superordinate to place and discipline.

The genre of landscape exists as a fine art, whose execution inevitably entails constructive neglect. The artist both proposes an expression of the landscape as well as imposes a representation. Whether hyperrealistic, romantic, or impressionist, in composing a work of art, “each generation imposes its cultural obsession” (Schama, 1995, p.12). “Cultural obsession” is a strong phrase, yet not too far from “conceptual obsession” imposed by a discipline and composed as a model, table, map, graph, or equation.

The word *landscape* also refers to a category of ecological theorizing and a level of geological inquiry. Landscapes are tangible, bounded, accessible, dynamic systems open to investigation. They are also complex, holistic, and in some measure, unfathomable, existing in constant flux and infinite detail across immense spans of time, discernable as patterns dependent upon the conception of choice guiding inquiry into their nature.

Metaphorically, history is a landscape of people inhabiting time with careful attention to place. Metaphorically, the phrase *cultural landscape* reflects the imperative of attending to human diversity. Commitment to several disciplinary conceptions and representations (sociological, historical, geological, ecological) illuminates multiple patterns in the landscape. Distinctive patterns of ownership, stewardship, and governance come to mind as crucial to place; for example, “the commons.”

### **The Commons as a Discipline of Place**

My purpose is not to review the literature on governing the commons. Instead, I propose this concept as an exemplar of disciplined thinking with particular relevance to the study of place and achievement of *querencia*. The concept of “the commons” functions as a bridge between place and discipline.

Hardin (1968) imposed his generation’s “cultural obsession” with rational self-interest, freedom, and their extrapolation in a finite world on the



phenomenon of communally held, overly exploited property. The literature stemming from Hardin's provocative article, "The Tragedy of the Commons," constructively neglects some aspects of a community's immersion in landscape and deliberately illuminates others (such as sustainable use, rights of access). "Tragedy" governs Hardin's imagery.

Elinor Ostrom's (1986, 1990) phrase "governing the commons" expresses her disciplined thinking about human interaction with renewable natural resource systems, obviously substituting the imagery of "governance" for "tragedy." Ostrom takes Hardin to task for oversimplifying how actual communities in historical circumstances have governed rights of use and investments in the capacity of a communally owned property to yield goods. She notes that Hardin's game theory conception imposes an unrealistic condition: the assumption that "players" are not free to negotiate the rules of their "game." Ostrom describes cases of avoiding the tragedy of the commons in which members of a community do have such freedom. Principles for avoiding "the tragedy of the commons" (the "inexorable logic" of a rush to ruination as each user pursues selfish ends) (Hardin, 1968) include providing for restricted access, establishing a means for investing in the future capacity of the resource (its renewal), ensuring that those entrusted with restricting access and investing in future capacity reap a share of these benefits (Ostrom, 1990).

Thinking disciplined by Ostrom's work on governing the commons offers students the chance to learn an enduring framework, applicable in many situations across several scales, from local meadow to global atmosphere, making a transition from the personal interpretation of experience to an appreciation of disciplined inquiry about communal forms of ownership and rights of access to a common property resource. Her conception of governing the commons promises understanding with depth, a place of cognitive retreat for gathering the strength needed to confront complex problems about resource exploitation and sustainability in the context of a cared for place. In many instances, such places are rivers and often they are governed as a commons. In this context, "river" may end its role as a metaphor for curriculum to become, quite literally, an object of study, the focus of curriculum. One river that functions well in this context is the Columbia of western North America.

Seen through a commons lens, what does the Columbia River reveal? This question integrates place and discipline, focusing attention on the history of fisheries, with gill netters in conflict with operators of fish wheels, with dam builders marginally successful in maintaining wild populations of fish, and with indigenous peoples successfully clinging to rights of access by virtue of court action. Historic blindness to native institutions for allocating rights of use and ignorance about the biology of anadromous fish (e.g., salmon and other species that spawn in fresh water and spend adulthood at sea) underpinned the degradation of the fishery commons.

### **The Columbia River as Landscape and Commons**

The Columbia River dissects landscapes of the Pacific Northwest, inviting storytelling, problem solving, interpretation, and place-based disciplined inquiry throughout the region. Laments about riches squandered and pristine qualities lost since the *Columbia Redidiva* first crossed the bar serves little use. No landscape is the true Eden; nature recuperates. When we celebrate its capacity to rejuvenate, to remain young, to bring forth in abundance we actually honor the myth of Eden in a proper way, argues David Oates (2003). Paradise is not lost but remains a place in myth, mysteriously capable of inspiring hope, a hope that children may feel when cultivating a garden, restoring a stream bank, or belling the cat to protect backyard birds.

The place approach to curriculum presumes that for a just society to endure, equitable and sustainable practices of resource procurement and utilization must exist. Fisheries, canneries, dairies, timber, power generation, and recreation have all laid claim to the Columbia as a commons rich in natural resources. Indeed, the Columbia River is a public, navigable waterway, a function enhanced by maintenance of the shipping channel. Dams have modified seasonal flow, perturbing not only salmon migration but also ancient rhythms of scour and fill. The U.S. Army Corps of Engineers has the charge of dredging the channel—and disposing of the spoils. Previous disposal of spoils has affected wildlife habitat, fisheries, levees, and park beaches in dramatic ways. New designs for ships and the competitive demands of international commerce call for increasing the depth of the channel, inevitably amplifying these impacts.

The river is wild when seen through a lens of conservation, its remaining pristine qualities and inexhaustible complexities valued. The river is engineered when seen through a lens of physics and put to work as a machine, its energy harvested by turbines. The river exists as a virtual river when seen through a lens of measurement and managed by computer simulation, its many states quantified into algorithms for changing flow levels. The river is wild, engineered, and virtual all at the same time: both organic and machine (White, 1995). The river invites inquiries about its stories, each story adding a sense of intimacy. The river is both landscape and commons.

### **RECAPITULATION AND CONCLUSION**

Huck's river, the Mississippi, a quintessential example of place, offered education. Place asks of each person to invest his or her talents in a responsible role, reciprocating for the gifts bestowed by culture and landscape. The call to assume responsibility is simultaneously a call to live equitably. Rivers are not only metaphors; they are literal places, such as the Columbia, with stories to uncover through artistry and inquiry. Navigating

a river—or the study of place—cultivates local knowledge and intimacy with the local landscape. Although rivers may meander aimlessly, achieving *querencia* guides the educational journey, the destination being an integration of place and discipline.

### **An Appropriate Integration of Place and Discipline**

The coherence brought to thinking and feeling through living and acting within a place overcomes the limitations of a conception of equity tied too closely to individual competitiveness (an ethic that might even undermine the rationale for public schooling itself). Place also has the potential to exhibit the utility and vitality of disciplined thinking and rescue learners from the sterility of academic purpose often felt in school.

Disciplines adapt to the demands characteristic of particular problems. Hence, the nature of prediction differs in evolutionary biology and physical chemistry. Disciplines, in seeking coherent conceptions for use in distinct contexts, pursue purposes different from achieving a sense of place. Due to divergence of purpose and different approaches to coherence, the educational aims drawn from place and discipline may conflict. Unless appropriately integrated, place-based education may tend to fragment subjects and, instead of depth, deliver only cursory levels of understanding.

In the weakest sense (yet still of value), this integration depends on place to supply problems as context for learning a traditional subject, geology, for instance. The aims of the discipline and the goal of understanding its conceptions remain intact. Should some approach other than place-based correlate with high achievement, the use of place will fade. Place functions as a means, not an end.

In all other senses of integrating place and discipline, a sense of place (“attachment with meaning”) becomes an end in itself or a means to a higher end: democratic living in sustainable, just communities (in turn, the community being a means for promoting health, liberty, identity, and fulfillment in keeping with the inestimable and intrinsic value of persons). Integrating place and discipline in these senses supports the rationale for public education.

Place redirects the work of disciplines; it exploits their resources for solving problems for its own ends of attachment to place and democratic living. Explanatory ideals remain intact, even though the discipline’s cognitive agenda recedes. The curriculum respects structures of knowledge and avoids the temptation to forge a host of subjects into a single amalgam of process.

At the next level of integration, recontextualizing and restructuring the knowledge of disciplines begins in earnest. Place itself becomes the principle object of inquiry with stories of multiple phenomena unfolding, leading to the enhancement of self and connection to community. The

transformation of disciplined thinking into conceptions guiding studies of place requires intermediate forms: subject fields that already accord place high status as a focus of attention. First among these is landscape art, followed by its cousin, landscape architecture. The imagery of the landscape appears in other fields: geology, ecology, culture, and history. The study of landscape calls for aesthetic as well as cognitive interpretation, emotional as well as epistemological coherence.

“Governing the Commons” (Ostrom, 1990) demonstrates disciplined thinking amenable to transformation into place-based aims. The commons, neither private nor public, spans topics of resource conservation and community governance. Adjudicating conflicts about resource access and use requires a sense of place, civic participation, and reliable knowledge in a problem-solving context essential to community well-being.

Appreciation for landscape art widens the horizon of criteria for evaluating inquiry to include those of artistic work. Among these are vivid depiction, empathy, constructive neglect, coherence, and witness to the universal in the particular. By appropriating conceptions from the many fields of landscape interpretation, the theoretical constructs of governing the commons, and the criteria of artistic work, the study of place establishes its own disciplinary stature.

Yet place remains a subject different from others, and achieving *querencia* is one way of expressing that difference. It refers to the emotional experience of grounded character, confident belief, and strength of identity, whether in terms of a geographic place (and community) or a set of well-understood ideas. *Querencia*, however, is not only another level of integration. It may accompany any level, whether weak or strong, to lesser or greater degree. Studying the local geologic story may produce a feeling of attachment with meaning to the landscape and enlist actions to reduce geologic hazards. Or the study of place, in a seismically active region, may converge on the same outcomes, yet with greater emphasis on producing the feeling of attachment with meaning—perhaps by actively doing art as well as science.

Meaningful understanding of both place and discipline depends upon coherence, ultimately in the learner’s sense of self in relationship with community and landscape. *Querencia* emerges from coherent experience tied to a place and a fondness for productive thinking in a particular context. From the perspective of *querencia*, equity means more than equalizing the opportunity for individuals to compete. It means the rediscovery of reciprocity between persons and places.

### ***Querencia* Along the Purgatory River**

A class of third and fourth graders sat down for lunch on a breezy day in May 1977. This was a very special location: At their feet were numerous

fossils of dinosaur footprints (Lockley, 1991, p. 128). Of course, when these beasts trod they walked across a landscape long departed, not the riverbank of today's Purgatory River, a tributary of the Arkansas. The impressions made were deep—both in mind and rock. The trackways encoded patterns of behavior on a single, steamy day during the Late Jurassic of Mesozoic time (approximately 145 million years ago) and marked the shoreline of an ancient lake.

The children's attention turned from eating a meal to being a meal. They imagined the fear a potential prey dinosaur might have felt with an allosaurus lurking nearby. The real tracks, winding along the exposed strata, provoked vivid imagination and speculation. They wondered what might have happened that day so long ago when the rock was only mud. Captivated by the landscape, their experience was informal, social, and aesthetic, offering a sense of place, a sense of time, and a genuine scientific puzzle to contemplate. Thirty years later, one of the students, now a parent with her own preadolescent children, wrote:

I was looking through some old photos from childhood, and found one of a field trip in the mid-1970's. You're in it. You were a great teacher for me as a kid, so it entered my head to look you up . . . found dinosaur now at Denver Museum of Nature and Sci. (I. Wood, personal communication, May 17, 2007)

I remembered her elementary school antics well—an inveterate collector of bones and fossils by age 10. She enjoyed gluing broken pieces of cow bones back together and mounting grasshopper body parts in her nature journal. We shared several correspondences and I learned that she had recently visited the site with her own children.

Note the cryptic “found dinosaur now at Denver Museum” comment in the message. At age 13, this young woman discovered on a private ranch in northern Colorado within the rocks of the Morrison Formation (Late Jurassic, approximately 145 million years ago) the exposed bones of an allosaurus skeleton, a large carnivorous dinosaur that stalked the fabled end elephantine brontosaurus (more properly, *apatosaurus*). A few years later, after repeated efforts to collect the fossil bones of her allosaurus, she contacted the Denver Museum of Nature and Science. When a curator arrived to verify her claim, she shared “box after box of beautifully collected dinosaur bones from beneath her bed” (Johnson & Troll, 2007, p. 139, tell her story, wonderfully illustrated in elegant detail), now displayed in the museum's “Prehistoric Journey” exhibit, presumably chasing *stegasaurus*.

The trip to the Purgatory came as the culmination of weeks of inquiry into local stories—geological and historical—centered on the Santa Fe Trail and the reconstruction of Bent's Fort. The class, for example, dug mud from the banks of the Arkansas and, using historical sketches drafted by Lieutenant James W. Abert of the U.S. Army Corps of Engineers at the

outbreak of war in 1846 with Mexico, used this mud to fashion a properly scaled adobe replica of the fort. (They camped for a few nights by the dinosaur footprints not far from the fort.)

Controversy now reigns over the landscape they experienced: preservationists set against the U.S. Army. The Army would like to expand its training grounds through acquisition of private ranchlands in Piñon Canyon not far from Fort Carson, Colorado. The Piñon Canyon Expansion Opposition Coalition (PCOE) opposes all such expansion (Goodwin, 2007), in part on the basis of protecting agricultural land and rights of ownership and in part on the basis of preserving short-grass prairie habitat, archaeological sites, and access to the dinosaur track sites along the Purgatory (the largest such collection exposed in North America and part of the federally owned Comanche National Grasslands). The most ambitious acquisition plans for the Army's Piñon Canyon Maneuver Site (PCMS) encompass an area about the size of Connecticut. The history of the Mexican War has crossed paths with the future of war in the Middle East; tracks from the heavy armour of war machines etched into the ground not far from the imprints left by heavily armoured organic beasts. This is the vivid imagery of the local story of the Santa Fe Trail linking the particular to the wider context.

I have learned the story of PCOE versus PCMS through continuing correspondence with my former student and current citizen activist, who wrote:

I got an anti-Piñon Canyon expansion resolution passed in my precinct that will go on to the Boulder county Democrats and then hopefully on to inclusion in the Colorado state Democratic platform. . . . The dinosaur tracks are not currently part of the Piñon Canyon Maneuver Site (PCMS); they are part of the [Comanche] National Grasslands. The army's map of the area of interest, at <http://www.pinoncanyon.com/images/mapareaofinterestweb.jpg>, shows the new larger army site engulfing the dinosaur trackway plus other paleontological sites, the Santa Fe trail, countless Native American sites, many beautiful canyons, and the habitats of endangered species. No one would get to see the dinosaur tracks ever again if the Army goes through with the expansion. Even currently you can only get to the tracks by vehicle if Piñon Canyon isn't holding maneuvers, as the access road goes through PCMS. The only current trail to the tracks requires a six mile walk off a cliff and around the northeast end of the current military site. (I. Wood, personal communication, February 5, 2008)

My former student admirably calls for the preservation of a significant place, a place of beauty and heritage understood through geological and historical inquiries, a place valued by its current inhabitants who would restrain its use as a military training ground. A place she knew as a child, with dinosaur footprints so large several friends could sit together around the rim of just one track. Later, through personal interest and formal schooling, she learned paleontology to discipline her thinking, making a discovery valued by the general public as well as the scientific community.

Her disciplined thinking led not to professional expertise as a scientist, though she came to appreciate the cognitive agenda of paleontology. Instead, contextualized by place, her love of subject contributed to her motivation for civic action. She had achieved *querencia*, finding strength and voice by valuing a unique place in the landscape and revisiting a familiar corner of her mind. Coherence marked her knowledge of self, subject, and community, with place and discipline more than reconciled: her disciplined thinking amplified her sense of place and vice versa. In this one story, a fragment of a life's journey, stands an example of how geographies of thought and land, comforting in their familiarity, in their promise of renewal, may capitalize on disciplined thinking and prompt commitment to community.

While attending a recent national geological meeting in her city, I had the good fortune to meet with her for supper. She introduced me to her children, with whom I shared pictures of their mother as a “child scientist” gluing cow bones together and pasting grasshopper wings into her nature journal. They led me to a room where drawers and boxes contained bones, shells, feathers, and fossils. Ostensibly “Mom’s office,” the place was more a miniature natural history museum, a gathering of artifacts—a place where she gathers her strength to know exactly who she is.

## REFERENCES

- Ault, C. R., Jr. (1998). Criteria of excellence for geological inquiry: The necessity of ambiguity. *Journal of Research in Science Teaching*, 35, 189–212.
- Dewey, J. (1990). *The child and the curriculum*. Chicago, IL: University of Chicago Press.
- Dweck, C. (2000). *Self-theories: Their role in motivation, personality, and development*. Philadelphia: Psychology Press.
- Eisner, E. W. (1998). *The kind of schools we need*. Portsmouth, NH: Heinemann.
- Gardner, H. G. (1999). *The disciplined mind: What all students should understand*. New York: Simon & Schuster.
- Goodwin, R. (2007). A lifestyle threatened. *Colorado Preservationist*, 21(2), 3–13.
- Gould, S. J. (1986). Evolution and the triumph of homology, or why history matters. *American Scientist*, 74, 60–69.
- Gowin, D. B. (1981). *Educating*. Ithaca, NY: Cornell University Press.
- Gowin, D. B., & Alvarez, M. C. (2005). *The art of educating with V diagrams*. New York: Cambridge University Press.
- Gruenewald, D. A. (2003a). Foundations of place: A multidisciplinary framework for place-conscious education. *American Education Research Journal*, 40, 619–654.
- Gruenewald, D. A. (2003b). The best of both worlds: A critical pedagogy of place. *Educational Researcher*, 32(4), 3–12.
- Gruenewald, D. A. (2006). Place-based education: Grounding culturally responsive teaching. *Democracy & Education*, 16, 24–32.
- Gruenewald, D. A. (2008). Place-based education: Grounding culturally responsive teaching in geographical diversity. In D. Gruenewald & G. Smith (Eds.), *Place-based education in the global age: Local diversity* (pp. 137–153). Mahwah, NJ: Lawrence Erlbaum.

- Gruenewald, D. A., & Smith, G. A. (2008). *Place-based education in the global age: Local diversity*. Mahwah, NJ: Lawrence Erlbaum.
- Hardin, G. (1968). The tragedy of the commons. *Science*, 162, 1243–1248.
- Haymes, S. (1995). *Race, culture and the city: A pedagogy for Black urban struggle*. Albany: State University of New York Press.
- Johnson, K., & Troll, R. (Illustrator). (2007). *Cruisin' the fossil freeway*. Golden, CO: Fulcrum.
- Kimmerer, R. W. (2003). *Gathering moss: A natural and cultural history of mosses*. Corvallis: Oregon State University Press.
- Kitcher, P. (1993). *The advancement of science*. New York: Oxford University Press.
- Kolbert, E. (2006). *Field notes from a catastrophe: Man, nature, and climate change*. New York: Bloomsbury.
- Lanza, D. (2005). Tapping the well of urban youth activism: Literacy for environmental justice. In M. Stone & Z. Barlow (Eds.), *Ecological literacy: Education our children for a sustainable world* (pp. 213–226). San Francisco: Sierra Club Books.
- Lockley, M. (1991). *Tracking dinosaurs*. New York: Cambridge University Press.
- Lopez, B. (1992). *The rediscovery of North America*. New York: Random House.
- Maderspacher, F. (2006). The captivating coral—the origins of early evolutionary imagery. Review of Bredekamp, H. K. (2005). *Darwins korallen: Frühe evolutionsmodelle und die tradition der naturgeschichte*. Verlag: Berlin. *Current Biology*, 16(13), R476–R478.
- National Research Council. (1996). *National science education standards*. Washington, DC: National Academy Press.
- Norman, O., & Ault, C. R., Jr. (2008, March 27). The impact of NCLB's accountability pressures on the instructional practices in an urban science class. SIG-Research session on effective programs, policies, and practices in Black education, American Educational Research Association (AERA) annual meeting, New York.
- Oates, D. (2003). *Paradise wild*. Corvallis: Oregon State University Press.
- Orion, N., & Ault, C. R., Jr. (2007). Learning earth sciences. In N. Lederman & S. Abell (Eds.), *The handbook of research on science teaching* (pp. 653–687). Mahwah, NJ: Lawrence Erlbaum.
- Ostrom, E. (1986). *How inexorable is the tragedy of the commons?: Institutional arrangements for changing the structure of social dilemmas*. Distinguished faculty research lecture. Bloomington: Indiana University.
- Ostrom, E. (1990). *Governing the commons: The evolution of institutions for collective action*. New York: Cambridge University Press.
- Posner, G. J., Strike, K. A., Hewson, P. W., & Gertzog, W. A. (1982). Toward a theory of conceptual change. *Science Education*, 66(2), 211–227.
- Rudolph, J. L. (2007). An inconvenient truth about science education. *Teachers College Record*. Retrieved April 23, 2007, from <http://www.tcrecord.org/Home.asp>
- Schama, S. (1995). *Landscape and memory*. New York: Alfred A. Knopf.
- Schwab, J. (1962). The concept of the structure of a discipline. *The Educational Record*, 43, 197–205.
- Semken, S. (2005). Sense of place and place-based introductory geoscience teaching for American Indian and Alaska Native undergraduates. *Journal of Geoscience Education*, 53, 149–157.
- Senechal, E. (2008). Environmental justice in Egleston Square. In D. Gruenewald & G. Smith (Eds.), *Place-based education in the global age: Local diversity* (pp. 85–111). Mahwah, NJ: Lawrence Erlbaum.
- Smith, E. L. (1991). A conceptual change model of learning science. In S. M. Glynn, R. H. Yeany, & B. K. Britton (Eds.), *The psychology of learning science* (pp. 43–64). Hillsdale, NJ: Lawrence Erlbaum.



- Smith, G. (2002). Learning to be where we are. *Phi Delta Kappan*, 83, 548–594.
- Smith, G. (2007a). Place-based education: Breaking through the constraining regularities of public school. *Environmental Education Research*, 13, 189–207.
- Smith, G. (2007b, October). *Connecting classroom to place and community*. Paper presented at the Place-Based Educators of the Northwest fall meeting, The Dalles, OR.
- Smith, G., & Williams, D. (1999). *Ecological education in action: On weaving education, culture, and the environment*. Albany: State University of New York Press.
- Sobel, D. (2004). *Place-based education: Connecting classrooms and communities*. Greater Barrington, MA: Orion.
- Tisdale, S. (1991). *Stepping westward: The long search for home and place in the Pacific Northwest*. New York: Holt.
- Toulmin, S. (1990). *Cosmopolis*. New York: Macmillan/The Free Press.
- Toulmin, S. E. (1972). *Human understanding*. Princeton, NJ: Princeton University Press.
- Twain, M. (1948). *The adventures of Huckleberry Finn*. New York: Grosset & Dunlap.
- West, E. (1995). *The way to the west*. Albuquerque: University of New Mexico Press.
- White, R. (1995). *The organic machine*. New York: Hill and Wang.
- Women's Health Initiative, National Institutes of Health/National Heart, Lung, and Blood Institute. (2006). Venous thrombosis and conjugated equine estrogen in women without a uterus: Findings summary. Retrieved September 14, 2007, from [http://www.whi.org/findings/ht/ealone\\_vt.php](http://www.whi.org/findings/ht/ealone_vt.php)