

**Paradise/Pair o' Dice:
Contradictory Characteristics,
Counterindications, and the Contingencies
of Environmental Justice in Real and Virtual
Terrains for Tomorrow's College Students**

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ABSTRACT

With attention to the next generation of college students, this essay argues that environmental organizations and ecocritics need to engage the contested terrain of cyberspace in terms of the ways that the World Wide Web and digital literacy are altering reading habits and individual experiences with nature. Building on the ideas of Jay David Bolter, James Paul Gee, and others, this essay claims that because of computers and computer games, the next generation will read differently and their multimodal reading will alter the way they investigate environmental issues. Multimodal reading may also increase their acceptance of contingency and their skills in problem solving. Some contemporary literature already reflects this engagement with contingency in both negative and positive depictions, such as novels by Sara Paretsky, Charles Baxter, Neal Stephenson, Barbara Kingsolver, Jonathan Lethem, and Molly Gloss. To promote environmental justice and to enhance ecological literacy, ecocritics must risk the embrace of the contingencies of the cyborg citizen, the multitasking problem solving mixed realist, and the playful fabulist.

KEY WORDS

contingency
ecocriticism
fiction

cyberspace
environmental justice
multimodal reading



The Enwebbed, Interplaying, and Multimodal Next Generation

American middle and high school students, as well as those of many other nationalities and citizenships, are growing up immersed in a more complex and more synthetic mixture of sensory stimulations than at any other time in human history. The synthetic side has certainly been gaining ground since the advent of the personal computer and the digital coding upon which it depends to function. A plethora of gadgets have evolved from the computer, such as Playstations, DVD players, and cellular picture phones. Today even the most radical environmentalist organizations and the majority of wilderness advocates rely on digital technology to communicate with each other, to pinpoint accurately wilderness habitats and their spoliation, to reproduce images of nature worthy of conservation, preservation, and restoration, to disseminate their ideas, and to solicit financial support and new members. Proponents of environmental justice will increasingly rely on web site development and email petitions to promote their messages and to enlist supporters in a variety of worthy causes from saving the manatee to reducing cancer deaths caused by industrial and military pollution (e.g. *Orion* November/December 2003, 78–79 and www.orionline.org).

Contemporary societies, through alterations in recreational and workplace environments, changes in the frequency and character of physical and intellectual opportunities for interaction with other people and with other living creatures, permutations of technology that both extend and impede direct engagement with much of the world, transformations of pedagogy, curriculum, and institutions in education,

are all blurring the distinctions between “work” and “play,” and between “education” and “entertainment.” Despite their highly contrived characteristics, a variety of “reality” based shows have been appearing on television, particularly on less well funded cable channels. “The Freshman Diaries” on the Showtime cable network, for instance, follows the lives of an ethnically and socially diverse group of first-year students at the University of Texas at Austin as they cope with a variety of challenges common to students moving away from home to attend a major American university. Although fundamentally entertainment, this show is also being used in a composition course at my university to discuss issues of citizenship, community building, and the benefits of service learning activities. Digital technology has made it possible not only for this low budget series to be recorded and broadcast but also to be reproduced in the classroom. Millions of Americans, with the numbers increasing every year particularly among fathers, are working from home and intermingling domestic work and child raising with career employment that is often only enabled by computer technology and high speed internet connections. This same type of flex time has facilitated the small but growing ranks of the ex-urbanites, those professional men and women who have moved beyond the city and the suburbs to repopulate small towns and rural areas, a movement facilitated by e-commerce. These circumstances have enabled tens of thousands of Americans to take up small scale agricultural activities and animal husbandry on formerly abandoned farms without having to try to earn a living from such subsistence scale activities (see Murphey, for example). Are these gardens and backyard sheep herds work or play?

At the same time that free, open-ended physical recreation for young people becomes less available and more and more limited to structured after school and weekend activities supervised and organized by adults, we find a highly contradictory situation in the United States. More children than ever before participate in organized sports programs and various types of summer camps, and simultaneously suffer rapidly escalating rates of obesity and juvenile onset diabetes. They also have less and less direct contact with

uncultured nature and their own somatic spontaneity, yet have significant hours available for socialization experience. Thus for many young people outdoor exercise and sports activities feel increasingly like school and work and less like play and recreation. In many families the parents get more exercise and engage in more physically active recreation than their children. Yet, while they engage in less gross motor activities and have less contact with wild animals, they have more pets residing in the home. And, the children actually spend less time acting like "couch potatoes," passively watching television, than the children of ten or twenty years ago. Rather, through digital technology an increasing number of them are interacting with an ever widening range of peers, even at the international level, through computer games, web sites, and email (See Gee, Ch.7, "The Social Mind"). Sometimes these exchanges are organized around virtual sports and virtual animal care, and sometimes they are tied to following real sports teams and involving themselves with real animal rescue and support organizations. For many younger people, then, especially those in their early teens, there is developing a seamless web of interplay between real and virtual animals, actual and virtual sports, face to face and online computer games, personal friends and virtual friends.

We further see that they mix together adult pretend play and animated simulations of adult life. Digital technology has also affected their reading and researching practices so that they mix together textual book reading and iconographic, multimodal screen reading--book knowledge and web knowledge, work and volunteer activities, talking and instant messaging, cultivating physical friendships and networking virtual communities. While I was much more likely to run into a deer, possum, or raccoon at the age of ten than my daughter, she has her own physical encounters with animals, particularly dogs, cats, deer, snakes, and various raptors; and, she also has more accurate knowledge of whale songs, of dolphin behavior, of manatee interaction through listening and watching video clips of them on the web. While she can enjoy imagining what it would be like to swim with whales alongside a character in a fantasy novel, she can also go to the electronic zoo and call up video and audio clips of someone else actually doing such

swimming. While her backyard may have fewer wild animals in it than mine did, growing up as I did on the edge of a small town, her indirect contact with, and knowledge of, animals beyond her backyard is far greater than mine ever was.

The expansion of this web of interplay and increased interpersonal networking and technologically mediated experiencing of wild nature raises serious questions about the understanding and practice of environmental justice among the next decade's college students. How does it affect their level of interspecies and intraspecies empathy? How does it shape their moral distinguishing between real and virtual situations and actions? How does increased technological mediation of the natural world alter their experiencing of desensitization or enhanced sensitivity? What does the digital age do to their levels of abstract thinking and imaginative perceiving and their degrees of practical thinking and concrete observing? Is it a good thing or a bad thing that my twelve-year-old daughter's current Instant Messaging net name is "Witch Goddess 7" or that she modulates her persona through naming, vocabulary, and discourse, often initiated on the web and then transferred to face to face interactions? What is the relationship between her hours spent surfing the Neopets.com web site, designing, trading, and caring for virtual species, joining a guild and networking with other Neopet enthusiasts from several different countries, her sustained desire since about the age of 6 to become a veterinarian, and her willingness to spend on average ten hours a week doing volunteer work for an animal rescue nonprofit organization? You see, these are not abstract, virtual questions for me as some kind of Kantian, disinterested educational theorist who knows he will still be teaching in another decade and will have to engage the computer melded children of today. Rather, these are pressing, practical questions for me as the fifty-two-year-old father of an almost teenager, whose experiences of reality have an integrated technological dimension that I only contemplated at her age when reading "what-if" science fiction.

I want to speak to this set of questions pertaining to my daughter's life and to the lives of tomorrow's college students from a variety of

directions in order to try to get at some sense of the risks and benefits associated with the current kinds of multimodal, hypertextual reading/gaming practices that students from all over the world will be bringing to college classrooms within the next decade. While millions of these children with computer and web access cannot speak each other's languages, an increasing number of them can read sufficient English to link those words with an international array of iconography to communicate about topics, toys, and games of mutual interest, to team up with each other and to compete with one another on varied virtual terrains. The rapid development of translation software will only facilitate their bridging national borders. How many of the web sites they visit, how many of the games they play, will encourage their abilities to practice environmental justice, whether they hike in the wilds or visit a virtual Antarctica? In other words, how are ecocritics and environmental justice activists today positioning themselves in relation to this up and coming audience, in relation to this audience that will have to answer the environmental questions we leave unresolved and solve the ecological crises that contaminate their world and threaten the maintenance of the processes of this symbiotic planet?

In relation to this question of what proponents of environmental justice will do to engage the contested ideological terrains of cyberspace, I want to consider some additional questions, not all of which I will be able to answer today, even partially. For instance, how might changing patterns of reading from linear textuality to screen multidirectionality and its potential impact on neural pathways affect the way young people look at the patterns in nature (we know, for instance, that reading Chinese characters stimulates more bilateral brain activity than reading linear alphabetic languages)? How do the nonlinear thought patterns in complex, synthesizing problem solving encouraged by surfing the web and associative hyperlink traveling depart from the kind of Aristotelian and linear development navigation on which traditional narrative, curricular materials, and expository writing models are based, and what benefits or detriments might arise when youth used to such thinking confront environmental crises? How do we evaluate the relative benefits and dangers of varying types of

recognition, experience, and acceptance of contingency, unanticipated consequences, and open-endedness displayed and encouraged by numerous computer games and simulations in relation to the consequences of daily physical social experience and actions? Will virtual realities and mixed realities fundamentally hinder or facilitate young peoples' defining, playing with, and experiencing of inhabitation, given that conceptions of inhabitation affect the inculcation of environmental justice values?

Defining and Elaborating Terminology and Gaming Shaped Responsiveness

A few terms that I have used in the foregoing remarks could bear some clarification and elaboration. Let me begin with the concept of "multimodal discourse." In *Multimodal Discourse: The Modes and Media of Contemporary Communication*, published in 2001, Gunther Kress and Theo Van Leeuwen state that "multimodality" is "the use of several semiotic modes in the design of a semiotic product or event, together with the particular way in which these modes are combined" (20), which probably provides little clarity given its level of abstraction. But a statement early in the book might help: "it is therefore quite possible for music to encode action, or images to encode emotion" (2). Communication, then, is not purely verbal, nor is its message purely conceptual, but rather as we have come to expect from literature and art, meaning can be conveyed by a variety of sign systems and meaning itself may be as much emotional affect as informational exchange. Kress and Van Leeuwen define "communication as a process in which a semiotic product or event is both articulated or produced *and* interpreted or used" (20). Interactivity, then, is understood as a fundamental component of acts of communication, which renders them invariably dialogic and process based activity rather than monologic and packaged product. Such a definition of communication when applied to teaching requires that the teacher integrate the expectation of student alteration, interpretation, and modified reproduction of the material being presented.

Thus, viewed as a discourse, classroom pedagogy contains radically varied degrees of monomodality and multimodality, and, therefore, varying levels of interactive communication. The National Research Council, Kress and Van Leeuwen, Don Tapscott, author of *Growing Up Digital*, and many others anticipate that the technological literacy developing today among the college students of 2010 will require that classroom pedagogy become more multimodal and interactive in response to the expectations and electronic literacy of the students. In contrasting television and the world wide web, Tapscott notes that "TV is controlled by adults. Kids are passive observers. In contrast, children control much of their world on the Net. It is something they do themselves; they are users, and they are active. They do not just observe, they participate. They inquire, discuss, argue, play, shop, critique, investigate, ridicule, fantasize, seek, and inform" (25). Perhaps that is why "Video game sales are beginning to eclipse Hollywood box office receipts," with 60% of Americans playing video games, with 40% of these women (Chadwick 52).

All of this activity on the web results in people in general, but children in particular who have grown up with the home computer as standard operating equipment in the household, becoming hypericonographic readers. By that, I mean that they do not understand nor undertake reading as a purely visual assimilation of printed text. Rather, their reading consists of multiple complementary semiotic strata, both in terms of discourse and distribution (see Kress and Van Leeuwen 4-8, 20). They use icons to navigate the web and also anticipate seeing them turn up in communiques from friends, who embed a variety of shorthand icons in their instant messaging. In addition, as they are interacting with neopets.com and other sites, they read web site pages with various icons, graphics, pictures, hypertext links, and texts as one semiotic unit. While they are doing so, they are reading that web site page embedded in a computer internet screen replete with iconic toolbars, hypertext sidebars, advertisements, photos, and streaming video options.

Their reading gestalt is hypericonic rather than textual; in the former case all of the nonverbal semiotic elements are perceived as part

of the medium and the message, while in the latter case illustrations, photos and the like are perceived as add-ons and not integral to the message. The comic book and the graphic novel are the print-text version of this multimodal reading, but are far less varied, fluid, and multi-discursive than web sites. As Jay David Bolter has noted, "the World Wide Web offers us the experience of moving through a visual and conceptual space different from the space of the book" (45). With such a gestalt formation for reading, hypericonographic readers have a very different reaction to references, notes, appendices, and glossaries. Print text readers often view such material as intrusive: "In a printed book, it would be intolerably pedantic to write footnotes to footnotes," observes Bolter, but "in the computer we have already come to regard this layered writing and reading as natural. Furthermore, the second page is not necessarily subordinate to the first" (27). As a result, for my daughter, doing homework about whales and dolphins involves not only reading a passage in a reference book or an encyclopedia but also viewing several web sites of organizations that conduct research on whales, engage in whale rescue and rehabilitation efforts, and undertake actions to protect the various whale species. She will not just read about whales in general, but also will read about different species and will be aided in remembering their differences through the pictures and video clips of each type that are hypertextually linked to the printed information. She will also spend some time listening to recorded whale songs and if she has to prepare a report for school she may download various media representations to create a multimedia cd-rom rather than just a typed-up essay.

These technological differences in communication are contributing to the development of students who will be high contingency semiotic thinkers and communicators. By that I mean that hypertext, web sites, computer games and internet messaging increase individuals' awareness of the contingencies of daily life and the porosity and permeability of personal experience. My daughter has become a great fan of the various Sims computer games, which have "sold more than 8 million copies worldwide" (Phan). These games build in far more contingent experiences and addressing of virtual

reality variables than ever was possible when she played traditional Barbie games. In "Sim Town," for instance, the player must determine how much land to devote to agriculture and forests, how much rainfall is needed for crop growth, and so on. In "Sim City 4," players are not only offered the opportunity to build major cities, but also to build agricultural communities and have the two forms of inhabitation interact. They also can create environmental catastrophes and then work at responding to them. In "Sims Unleashed," attention must be paid to the contingencies of daily life. If a player fails to empty a kitchen wastebasket, flies begin to gather around it. If a player installs a fire hydrant in front of a home, dogs begin to converge on it the next day. In one of the houses, the stove will catch on fire unexpectedly, while in another household the father in the family will suffer from depression and be at risk of losing his job. Far from reducing the amount of imagination involved in child's play, the Sims products introduce variables and contingencies that require significant imaginative activity, both in designing virtual worlds and in addressing the intrusion of very real world problems into such virtual projections.

James Paul Gee, author of *What Video Games Have to Teach Us about Learning and Literacy*, argues that good video games "stress both nonlinear movement . . . and linear movement. . . . They stress multiple solutions" (164). Learning for players of such games is predicated upon "situated cognition," "reason on the basis of patterns . . . picked up through their actual experiences in the world," and being "'networked' with other people and with various tools and technologies" (8). Numerous lessons about ecology and human environmental interaction are explicitly or implicitly presented through various quality computer games. For instance, as Gee notes, one game for primary school children, *Pikmin*, includes the possibility of all of the Pikmin characters dying off in what the game defines as "an extinction event" (20). In a game for older payers, *Deus Ex*, the player's decisions lead him to face three possible ways of ending the game. One of these calls for letting a centralized computer become the world government, while another calls for destroying the global communications infrastructure, so that political centralization is

overthrown and the world returns “to a plethora of small villages” (Gee 80–81). One could easily imagine designing a computer game along these lines that would pit technologically driven environmental solutions against Murray Bookchin’s social ecology or the formation of a global green UN with military power to punish polluters against a primitivist model of bioregionalism. *E Magazine* recently ran an article on “Environmentally Themed Videogames,” which provided examples of games for all different ages (Chadwick 52).

Not only the games but also other hypertext sites and texts encourage such multi-sided engagements and activities. For instance, Ruth Ozeki’s *My Year of Meats* is written by an author who has established a reputation as a documentary film maker and that training is reflected in the structure and style of the novel. That structure in turn encourages students to respond with hypertext projects that would provide more factual information about the environmental problems associated with the American cattle industry’s high use of antibiotics, growth hormones, and dangerous feed supplies, which could easily be supplemented by videos on cattle ranching and slaughterhouses. But beyond such convenient linkages because of the content of a particular novel, Bolter argues that the very design and spatiotemporal configuration of electronic media can facilitate a more systemic, and hence ecological, perception of reality: “Our culture is defining the electronic encyclopedia, and electronic books in general, to reflect a different natural world, in which relationships are multiple and developing. It is a world in which the distinctions between nature and culture and between information and medium are unstable. . . . Cyberspace is not, as some enthusiasts have argued, divorced from the natural and social world that we know; rather, it is an expression and extension of both” (98).

Contingency, Problem Solving, and the Relative Orientations of Young Adult and Adult Literature

The foregoing suggests what computer games, hypertext, and other electronic media might offer environmental justice if its various

practitioners and proponents were to engage in various kinds of computer game design. It also suggests how students will make use of the web sites that various environmental organizations are developing. In this section, I want to focus on literary texts young adults and adults are reading and their relationship to environmental justice on the one hand and technological development on the other hand.

Across a diverse array of contemporary American fiction, particularly genre literature, that is, detective, mystery, fantasy, science fiction, and even romance, literature, environmental crises, ecological issues, and acts of pollution have become common plot devices and settings. This situation both reflects the depressing ubiquity of natural despoliation and the uplifting prevalence of recognition of environmental problems. But the recognition does not necessarily mean that authors are building heroic stories out of fighting the good fight. Three novels stand out in this regard: Sara Paretsky's detective novel, *Blood Shot*, Charles Baxter's *Shadow Play*, and Neal Stephenson's *Zodiac*. Paretsky has written a series of novels about a Chicago-based female private investigator, V. I. Warshawski. In *Blood Shot*, this hero risks her life to lay bare a coverup of environmental pollution in her south Chicago childhood neighborhood. She learns that the cancer ravaging a mother's friend results from a corrupt chemical company determined to avoid paying the hospital and death benefits due for their unnecessary exposure of the workers to toxic substances. While the novel focuses on corruption, greed, and inhuman treatment of workers at the hands of capitalists, the novel nevertheless exposes the kinds of toxic poisoning all too frequent in the industries of greater Chicago and the efforts of corporations to hide their liabilities rather than to accept them. The political geographer, David Harvey, views this novel as exemplary of a crucial recognition: "as the contemporary environmental justice movement has rediscovered . . . the only path to improvement was empowerment of the poor and working classes in the face of a recalcitrant, obdurate, and often corrupt corporate power structure. . . . Sara Paretsky's novel *Blood Shot*, set in contemporary Chicago, captures the nature of this struggle most graphically" (395).

In contrast, Charles Baxter in *Shadow Play* builds industrial

pollution into the plot as if it were a given of contemporary society. The back cover observes that “when [Five Oaks Assistant City Manager Wyatt Palmer] lures a toxic-waste-producing chemical plant to his economically depressed town, he discovers he has truly made a deal with the Devil.” With such a description we might expect that Wyatt would fight to undo the damage he has done by enabling this factory to operate under his jurisdiction, especially given that his brother develops terminal cancer as a result of working there. But no, Wyatt merely helps his brother commit suicide, then tries in a half-hearted amateurish way to set the factory owner’s house on fire, succeeding in only burning a dog to death, and then has a nervous breakdown. During this breakdown Baxter’s narrator reveals the protagonist coming to the conclusion that no morality exists any longer in a world where “God had died and taken evil with Him” (383). In the end Wyatt moves to New York and resumes his vocation as an artist. Unlike other tragic novels that depict the unacceptable destruction of human lives and the unaffordable price of prosperity in terms of ethical decay and the despoliation of nature, *Shadow Play* can lead readers to view escalating cancer rates as another part of the setting of aimless American lives, a setting that is neither tragic nor changeable.

Fortunately, Baxter’s novel does not represent the typical response to contingency in the world or to the recommended reaction to environmental ills. Neal Stephenon’s *Zodiac: An Eco-Thriller* was originally published in 1988, the same year as Paretsky’s *Blood Shot*. In response to his rising popularity as an author and the ability of a widening audience to appreciate the content of his novel, it was reissued in 1995 and again in 2003. In this novel, the protagonist, Sangamon Taylor, works in Boston as a chemical analyst for a peaceful environmental activist organization constantly blowing the whistle on industrial polluters in the region, particularly in Boston Harbor. As with any well plotted thriller or detective novel, Taylor deals with myriad contingencies, plot twists, and surprises produced by new evidence. But in the end, and beyond what he can imagine at novel’s beginning, he finds his corporate and individual culprits and helps reduce the level of Boston Harbor’s notorious pollution. Unlike Wyatt

in *Shadow Play*, Taylor is never paralyzed or overwhelmed by the uphill battle against overwhelming odds that defines the environmental justice movement. At the same time, Stephenson nowhere provides a silver bullet that will allow all to be made better. Rather, readers come away having learned a great deal about environmental pollution, particularly biphenyls and dioxin, as well as a sense of the necessity to continue to struggle for promoting what Sandra Steingraber labels "the least toxic alternative" in *Living Downstream* (271).

Having read all three of these novels, readers might walk away from *Blood Shot* satisfied that justice has been done in a single incident and the case has been closed. The same readers may either walk away from *Shadow Play* gripped by a pessimistic sense of fatalism or, having refused to identify with the protagonist, angered that some people would accept environmentally induced cancers a necessary cost of doing business. With *Zodiac* readers both gain some satisfaction, but also are forced to think beyond the covers of the book to the environmental justice battles looming around them and the need not to turn away or pretend that all is well or well enough. *Zodiac* thereby neither embraces Paradise or totally accepts the pair o' dice contingency and chance of daily life, but calls for intervention and action.

Let me now turn to another trio of novels: Barbara Kingsolver's *Prodigal Summer*, Jonathan Lethem's *Girl in Landscape*, and Molly Gloss's *The Dazzle of Day*. *Prodigal Summer* represents the embrace of "paradise" as a potential for immediate human realization. *Girl in Landscape* and *The Dazzle of Day*, in contrast, focus on the more realistic "pair o' dice" contingencies of life while set in the future and written as science fiction.

Kingsolver presents the interlocking stories of a group of individuals living in southwestern Virginia. One is a forest ranger observing the survival skills of coyotes, another is an elderly widower alienated from family and friends, and another a young widow who needs to decide whether to stay on the land and knit ties with her in-laws or return to an urban life. Eventually these lives are revealed as already interconnected and become more intertwined as the plot

unfolds. Throughout, Kingsolver seems to establish the coyote species' survival skills as a utopian model for human social rehabilitation. In the end the ranger is happily pregnant, the elderly widower is entering into a relationship with the widow next door and his own estranged grandchildren, and the young widow is taking responsibility for her dying sister-in-law's children. Readers learn about national forests, coyotes, sheep, farming, orchards, and cancer along the way, but primarily Kingsolver promises readers that all can be worked out and made better if family is placed at the center of people's lives and we accept that we form an integral part of the natural world to which we must adapt. The utopian tone of the novel comes through clearly in its final words: "Every choice a world made new for the chosen" (444). The novel is highly successful and affective for those already sympathetic to the author's values, but unlikely to convert skeptics or to hold the interest of younger readers.

In contrast, Lethem presents a kind of punk fiction with hard edges and mostly dubious characters. The humans have left a highly toxic earth for promising parts unknown on a planet portrayed much like the American western frontier of the nineteenth century. The aliens remain highly alien and the adults all blunder in their efforts to populate the planet on which the aliens already live. Reversals abound in the novel. Lethem concludes that the adults are incapable of learning to inhabit the portrayed planet because they cannot cast aside the earthboundness of their ideological blinders, particularly their individualistic Utopian perceptions of what constitutes "paradise." The children, however, such as the girl identified in the title, do learn to accept the planet on its own terms and the aliens on their own terms and represent the possibility of learning how to inhabit a new place in new ways, rather than turning the alien into the familiar and destroying it in the process. Without utopian expectations, the young people of the novel embrace the contingencies of new inhabitation and the word "maybe" is voiced and thought repeatedly in the final few pages. Multimodal rather than monomodal, contingent rather than utopian, Pella, the girl in the landscape is committed to muddling through rather than discovering or realizing some grand design.

With *The Dazzle of Day*, Molly Gloss begins with a utopian community that leaves a toxic Earth increasingly hostile to the group's Quaker beliefs aboard a space ship. On the long voyage to another world, eventually all of the community members are people who have been born, raised, and lived exclusively within this ship, with its ecological and technological stability and its cultural homogeneity and proximity. As the ship nears the first potentially habitable planet they have charted, the people begin to become divided. The surveyors of the planet experience shipwreck, death, and disaster and have their faith and sanity shaken by the harsh reality of the world they encounter. The residents of the ship realize that the planet is far more inhospitable than any of them could have imagined and some wish to remain in the safety of the ship, electing to remain within it forever or continue searching for the utopian planet of their desires. Jumping forward in time, the novel reveals that the would-be inhabitants have had in many ways to rethink the culture that worked on shipboard and redefine home while adapting to a new way of life. Again, as in *Girl in Landscape*, contingency and the "pair o' dice" chance of multiplicity, variety, and difference are accepted as the means for continuing to survive.

While a beautiful novel, Kingsolver's *Prodigal Summer*, remains in many ways quite static and predictable, optimistically fatalistic and self-assured, whereas the other novel seems more reflective of the ways of thinking likely to appear more prominently in the next generation of college students. Which kind of thinking should we expect to encounter in contemporary writing for young adults, for my daughter's age group? Based on her reading selections and her gaming selections, she appears to prefer the contingent to the utopian. One of the series she has read recently is called "The Yong Wizard Series." Each novel in this series incorporates some kind of environmental topic or action, even when it does not constitute the main theme. In *Deep Wizardry*, the two young wizards become involved in helping whales, dolphins, and sharks re-establish balance in the waters off the New York/New Jersey coast. In the course of describing their shape-shifting experiences, the author, Diane Duane, describes the extent of environmental pollution and its harm to the creatures of the sea. While the novel ends on a more

utopian or “paradise” note in the successful reestablishment of equilibrium, it comes at great price, including death and self-sacrifice. In *The Wizard’s Dilemma*, efforts to reduce environmental pollution are reiterated in the context of the fundamental responsibility of wizards to care for the planet and to slow the pace of entropy. But in this novel, there is no possibility of a utopian ending, since the conflict is focused on the female wizard’s mother having terminal cancer. The right of all creatures, including viruses, to pursue survival is addressed, on the one hand, but on the other hand, the focus falls primarily on the necessity of remaining principled and not accepting an end-justifies-the-means approach to resolving interspecies conflicts. The mother’s life cannot be saved and cancer cannot be eliminated magically, although wizards can continue to learn how to restore balance and reduce destruction. In many ways, this young adult novel parallels the attitude expressed in Stephenson’s *Zodiac*.

While I have only been disappointed by one of these novels, *Shadow Play*, and enjoyed all of the rest, I am concerned with how these novels position their readers in relation to monocausality and multicausality, and how they will play with the readers of today, both adults and young adults. Which novels will interface better with the experiences, practices, and ways of thinking of computer-oriented thinkers? How can we integrate the ideas, experiences, attitudes, and ideologies represented in environmental literature promoting concepts and practices of environmental justice with the kind of technological literacy of today’s middle school, high school, and college students? Which literature will encourage protest, activism, understanding, and the will and belief in change, and which may not?

Beyond the Cry of Protest, Beyond the Appeal to Turning Back the Analog Clock

The cry of protest must always be heard and supported and must always be made available for students to understand the crises, the issues, the problems that beset people. In particular, we must work hard to bring continuously before the majority, before the dominant, the

protests of the disenfranchised, the exploited, the oppressed, the imperiled. In recent decades, in fact, tremendous strides have been made in literature and composition courses, through new historicism, multiculturalism, and cultural studies. As a result, the protest poems of such native writers in the U.S. as Simon Ortiz and Haunani Kay-Trask and the historical novels documenting environmental destruction of Kiana Davenport and Louise Erdrich, are widely available and frequently taught.

Yet, I want to suggest that they are not enough, that the emphasis only on what has gone wrong, on what has been broken will not suffice. When people speak of returning to the old ways, of going back to a place relationship only to be found in the past, and perhaps only imaginatively so, if they are taling about metaphorically turning back the hands of time, they are using an analogy that will not work in the digital age. Only analog clocks have "hands" and allow for turning back time. Digital clocks are only reset by going forward and have numerical icons. Yes, the numbers are reflashed as the time is reset; yes, the previous numbers can be recovered and reset, but only by situating them in the future. For the cries of protest, for the historical evidence of environmental destruction and habitat degradation to win the hearts and minds of the next generation of college students, they will need to be placed in the context of the potential for change, correction, and redress in the future. The next generation will want to explore them on a virtual terrain in order to test out potential solutions. They will want to generate myriad computer simulations to explore the ways that cultural diversity can be brought to bear to maintain biological diversity, to investigate how the restoration biology projects of reintroducing this or that species to the wild might impinge upon the ecosystemic interactions already occurring. They will want to play the computer game of Yosemite wolf reintroduction before supporting a local initiative to reintroduce a predator species in the local waterway. One can think back and notes far too numerous species introduction projects for both flora and fauna that have proven disastrous and speculate profitably on how a generation raised on computer simulation games might have investigated the pros and cons of such

actions before undertaking them, whether this exploration were to occur with rabbits in Australia or kudzu in the southeastern United States. But whether or not we will be shaping curriculum, reading choices, and gaming selections that will promote such interest or not depends to some degree on our willingness as ecocritics and environmental justice advocates to embrace what Chris Hables Gray has called the “cyborg citizen.”

Risking the Embrace of the Contingencies of the Cyborg Citizen, the Multitasking Problem Solving Mixed Realist, and the Playful Fabulist

In “The Seductions of Cyberspace,” N. Katherine Hayles, while recognizing the significant dangers of virtual reality and inadequate tactile contact with the material world, concludes on a note of optimism: “One can imagine scenarios in which the Other is accepted as both different *and* enriching, valued precisely because it represents what cannot be controlled and predicted. . . . Applied to the physical world, this realization values it for its differences from the virtual world—its incredibly fine structure, sensory richness, material stability, and spontaneous evolution. The positive seduction of cyberspace leads us to an appreciation of the larger ecosystems of which we are a part, connected through feedback loops that entangle our destinies with their fates” (188). The multiplicity of options for information, contrary viewpoints, correctives and challenges to dominant scientific prejudices and popular beliefs, dialogues across cultures, genders, and generations, and the mechanisms for forming affinity groups, alliances, and social activist organizations that digital technology enables facilitate this kind of appreciation of the Other as a familiar, but different, always somewhat mysterious, Another, proximate yet never identical. And they intensify the sense of contingency and opportunities for effecting change that the next generation will need to pursue environmental justice. As Will Wright argues in *Wild Knowledge*, “the world must be conceptualized as both independent of direct human control and reliably responsive to knowledge-based

human actions. Similarly, human beings must be conceptualized as having a *formally necessary* but *substantively contingent* relationship with their world, a relationship through which knowledge is always formally possible but also possibly mistaken" (173).

In order to develop and sustain an optimistic view toward the long term impact of digital technology on human-nature interaction and environmental justice, we must believe along with Arjun Appadurai who writes in *Modernity at Large* that "conceptions of the future play a far larger role than ideas of the past in group politics today" and that "imagination and agency" are vital "to group mobilization" (145). Perhaps that is why Niles Eldredge argues in *Dominion* that "We need an updated story, one that acknowledges that we did not so much leave the natural world as redefine our position in it" (xv) and "We need a new vision, a revised story of who we are and how we fit into the world" (166), because although "We have indeed stepped outside of local ecosystems. But we have not stepped outside the natural world. . . . We stand foursquare as interactors with all the dynamic elements of the earth's natural system" (168). For young people today, many of whom can have only relatively limited access to wilderness spaces if we want those spaces to remain wilderness, many of whom will have direct contact almost entirely with cultivated, domesticated, and incarcerated nature, computer simulations, ecological system models, and conservationist and sustainability games will provide an essential component of their intellectual engagement with the world. And such engagement can generate environmental empathy for wildness both near and far. At a time when at my own university the newsletter of the Office of Research describes faculty research on nano-sized particles for medical applications and declares that "The potential for creating new materials at a size capable of being absorbed by human cells calls for anew type of scientist—one who can collaborate across seemingly unrelated disciplines" ("Unique" 8), ecocritics and environmental justic advocates cannot afford to ignore the need also to "collaborate across seemingly unrelated disciplines" and leave the terrain of virtual cyberspace to technocrats and transnational corporations. Nostalgia as a strategy for instilling a love of nature and a conservationist agenda in

the college student of 2010 is not likely to carry the day. I find myself utterly unable to disagree with Gray's contention that "Tools are here to stay, machines are here to stay, cyborgs are there to stay. The real issue is which tools, which machines, which cyborgs we will have in our society and which will be excluded or never created" (6).

For the sake of the possibility for an ecologically sustainable future, I must hope that my multi-tasking mixed realist mode daughter, who shifts from textual reading to multimodal reading, from biography to fantasy, to documentary, from playing the emergency vet computer game to volunteering on weekends with the local Pet Rescue and Adoption organization and donates money to save the manatees, will use digital technology to realize her vocational goal of becoming a veterinarian. And, finally, I must also embrace my role as a playful fabulist who critiques literature and weaves ecocritical theory and criticism into fabulations of how society might embrace the wild knowledge of this world's multitudinous contingencies to become ecologically literate and do justice to each other and the world in which we live and die.

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