FCJ–136 Toward Environmental Criticism

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Background

The rise of the ambient brings new directions in environmental criticism. Here 'the ambient' means a continuum of contexts where information has been embedded locally, to facilitate being brought in and out of focal attention. How may design for that state contribute to necessary shifts of worldview? Do new relations of embodiment, touch, tagging, and display change environmental awareness, no so much of global problems as of simply being in and part of the world?

This word 'environmental' has been badly abused; it seems to mean everything to some people and nothing in particular to others. So long as whatever this word meant was considered large and far away, absent of technology and beyond human agency, it was difficult to imagine much less act upon. So long as information technologies have been considered placeless and nonmaterial, they have hardly been part of such imagination.

Information has always had environmental effects, nevertheless. Abstract systems of access and distribution have physical, even geographic manifestations, and sometimes direct map-

pings. One most dramatic example of these might be America's Jeffersonian grid, a system of survey that encouraged commodification of land. More recent information technologies not only map environments but also interpret them. Data visualization techniques have advanced public environmental education. Then too, information infrastructures themselves have ecological footprints. Any of these relations of the digital and physical might suggest background for any of these essays in this collection. But here, let us narrow the scope to a question of coupling embodied information to shifts in environmental criticism.

For as humanity now changes not only its means, but also its ends, economic valuation shifts dramatically, and in the process creates a greater role for design. As the upkeep of non-fiscal capital (e.g., natural, human, or cultural) becomes a more viable enterprise, design emphasis shifts from extent of material production toward more intensive, systemically integrated patterns of living. As in a traditional culture where waste was less of a possibility, the new environmental economy produces a sense of simple elegance that is everywhere. Here the wish for distraction declines, and the sense of participation increases. It is a simple truth of urbanism that people take care of things and places that they value aesthetically.

Given these overarching concerns, here are four threads for consideration in this essay:

> 1) Consider a turn in environmental history, which admits not only of urbanism but also of ambient media.
> 2) Ask whether an information environmentalism is desirable, even possible, or whether it is mainly censorship.
> 3) In the context-sensitive practices of the expanding discipline of interaction design, what might already be environmental, in some larger sense, at least implicitly so?
> 4) Under what themes does the discipline develop a critique of these values, attitudes, and practices? How might this follow from developments in literature and the arts?

1. A Turn in Environmental History

First, a turn in the field of environmental history generally concerns itself more with artifice, and specifically investigates the relation of built environments and cultural values. Although such interest was once perhaps countercultural it now enters mainstream debate.

Environmental history asks how human affairs transform the living world. This has of course become the central question of our time. So that others might ask better how else humanity might live, environmental history first describes the effects of particular ways in which particular peoples have already lived. While lands may indeed shape cultural dispositions, environmental history reverses these relations to look at how cultures and destinies have shaped the land. Like much else in early environmental work, it has simply tried to document impact.

Such studies of setting and circumstance may seem normal to any discipline with ethnographic roots. Interaction design has been one of these from the start. Yet even quite recently all this emphasis on place would have been considered unusual, nostalgic, and perhaps misguided, in just about any field. Circumstance was something to transcend. Modernity was the general belief that humanity could impose abstractions on the world until those became the world, at least in human experience, and especially through the use of technology.

To admit of circumstantial impacts was not what most historians did anyway. As Donald Worster declared: 'In the old days, the discipline of history had an altogether easier task. Everyone knew that the only important subject was politics and the only important terrain was the nation-state' (Worster, 1988: 289).

Environmental history thus belongs to a more fundamental turn toward the study of everyday life. This breakthrough has generally been credited to the *Annales* school of economic historians (e.g., Bloch, Lefebvre, and Braudel in France). Much of this took a voice that was countercultural, in which material circumstance was mainly evidence of political marginalization. Environmentalism inherited that voice.

Those of us born into an age where awareness of environmental crisis is an ongoing way of life may have difficulty imagining that it was once uncommon to admit environmental sensibilities of any kind (Buell, 2003). It took a while for enough people to shift frame of reference from what were almost entire instrumental, pragmatic forms of value to admit intrinsic forms of value, or to understand humanity as an intrinsic part of a living world. But meanwhile it was being forgotten, by some quite saturated in technology, how it was just that immersion that so shocked early environmental critics. Hence the resonance of California essayist Henry Miller's epithet (1970): 'the air-conditioned nightmare.'

Considering the first decades of 'doing environmental history,' Worster emphasized how in the origins of this field, artifacts had been excluded.

The social environment, the scene of humans only interactive with each other in the absence of nature, is therefore excluded. Likewise is the built or artifactual environment, the cluster of things that people have made and which can be so pervasive as to constitute a kind of 'second nature' around them. (Worster: 293)

This is where the field necessarily began.

Thus another early step toward an environmental history of ambient information was to admit of any positive role for design. Without this, the countercultural origins of environmentalism too often reduce into naïve wholesale oppositions of nature (good) and artifice (bad). There are people who believe that any human intervention detracts from a place – even, say, the Golden Gate Bridge.

More general histories of the city did not lack awareness of environment. Many a mythology began from the founders hallowing a chosen spot. Geography was destiny. City air, for all its stench, was said to make men free. Yet it was the stench that demanded a new breed of historians. Environmental history of the city was history of plague and pollution. Industrial urbanism seemed not only separate from the world, but completely in opposition to it.

Now, much of this has been changing. For one indicator of this change, note 'Green Manhattan' (Owen, 2004). Hardly an ideal place, and more like the early environmentalists' very idea of what to avoid, Manhattan turns out to be more green than most of America when its huge carbon consumption is normalized per capita. Relative to their exurban counterparts, New Yorkers have less stuff, perhaps more fun, and lower ecological footprints, all without risk of cholera. And not to get ahead of the story, but many of the benefits of mobile and embedded media incidentally first appear in places of highest social density.

It is instead the exurban domains where environmental knowing seems most absent. Somewhere in suburbia somebody has never even gone for a walk. Also it is in the rural domains where the worst perversions of the biosphere are perpetrated by agribusiness. To early environmentalists, the extent to which exurban artifice would disable common sense was not yet conceivable.

Thus the next step in environmental history was to treat the relationship of planetary crisis to settlement patterns, as if not all urban artifice were bad, and some ways of living healthier than others. Do poorly built environments undermine the very ability to think environmentally? It is ever more useful to ask how artifice can dramatize human agency and belonging in the world, not just provide conquest, distraction, or escape.

Urban environmental history, once considered an oxymoron, asks how settlement patterns present and reflect choices about worldview. Although often beginning from the ecological impact of economic production, it can proceed to questions of consciousness concerning just what about a production or its side effects is considered necessary. It asks what has been valued as commons. Whatever its foundations in pristine nature, it also studies questions of liveability.

This has enhanced a tendency within media, which have often been self-referential. Given the inherent quality of digital media to include both information about itself and links to other media productions, media studies increasingly investigate information as a world in itself. For some young people steeped in electronics, history goes back only so far as electronic recordings.

Histories of information, which became abundant during the web boom, have thus emphasized long term change in literacy, and not the environment. Yet literacy itself can be situated. Once it was solely in monasteries. Commercial television was first rolled out in taverns, to take another example (McCarthy, 2001: 5-7). Where you read a book affects how you read that book. The locations in media which actually get used deserve more study. This provides one way toward environmental criticism.

2. Information Environmentalism?

Second, a question of information pollution has long existed but now accelerates. Media facades especially stir public debates, not only legal but also philosophical. A sense of unprecedented distraction keeps growing.

To send your first-grader on a school field trip, you might have to fill out twenty lines on a form, over breakfast that morning. At work your inbox is stuffed, not only with spam (which

can be filtered), but also with reply-to-all-recipients email from your colleagues (which cannot). Over lunch, there's no fashion crime in wearing a hands-free phone on one ear. To get the attention of a colleague who is playing his iPod loudly enough that you hear it too, you might have to raise your voice. After work you might have trouble finding a bar without television. You could carry a 'TV-B-Gone' universal remote, which scans through the IR spectrum in which most TV on-off signals lie, but you might be nervous about where you can get away with using it, and of course that would be yet one more gizmo to manage.

Twenty years have passed since Richard Saul Wurman coined the term 'information anxiety.' What does it take, he asked, to put the verb 'inform' back into the noun 'information?' (Wurman, 1989: 38). Context, for one thing. Few people claim that the ubiquity of wisdom has been rising so rapidly as ubiquity of data. Since those twenty years are the very ones in which information technology exploded into everyday lives, this expression may be worth reexamining. How has concern for 'information anxiety' canceled or reinforced other more basic environmental sensibilities? The more that its designs are embedded, the less the field of interaction design may ignore these issues.

Information anxiety feels like an inability to keep up, an urge to research your every move, or a duty to provide useless data. It comes at you over call lists, customer notices, and ubiquitous advertising. But not all information anxiety is junk. It is also your own inability to restrain your grazing on news, digging into the practices of your trade, or researching exhaustive minutiae of some hobby like knitting, that you supposedly do to relax.

In reconsidering Wurman's original thesis, the continuum of attention assumes more importance. One man's signal is another man's noise. 'What we choose to read and what we choose to ignore are, therefore, some of the most critical decisions that we make, yet they are invariably made with little thought, almost unconsciously' (Wurman, 1989: 204). The technical capacity to shift focus of attention has accelerated since then. Conversely, the social impetus to stay informed has been rendered absurd, both by the explosion of data and by the unforeseen capacity to search much more, and retain much less. Thus the relationship of environment and intent comes to the surface. To what does the context invite you to intend. How does the inscription of datascapes onto physical architectures invite intentions about being there instead of tuning out. How does the infoglut discount foreground messages in favor of a more ambient 'affect.'

'Ambient information anxiety' demands a new concern in the human sciences. Educators, ethnographers, sociologists, and psychologists now debate the intellectual and emotional impacts of a fulltime, ubiquitous, multitasked feed. Architects and urbanists need to find

their take on these issues as well. How does design of the physical environment mitigate (or worsen) information anxiety? When is it pollution?

In *Technics and Civilization*, Mumford observed that 'the first mark of paleotechnic industry was the pollution of the air' (Mumford, 1936: 167). The neotechnic phase, which anticipated what would later come to be called cybernetics, shifted 'from destruction to conservation' (255). For example, in nineteenth century Pittsburgh, smoke and fire were discussed aplenty, but to construct them as pollution was to think of them as a correctable nuisance; and this only happened much later. In a familiar cycle within technological determinism, pollution is a social construct.

Today a mother at the supermarket takes great care to scrutinize the ingredients on the labels of the foods she is buying for her family. Yet on returning home she may flip on the television without any similar vigilance. Obsessed with material pollution, she is oblivious to information pollution.

Nonmaterial pollution does exist. Most towns have regulations against nighttime noise, for example. At a loud party in the wee hours, it would be no surprise for the police to show up. Yet if there are no similar policies against light pollution, you might be able to light your driveway as brightly as technologically possible without concern that your neighbors would call the police.

Desktop data glut has been described as information pollution, that makes foragers likely to 'hunt elsewhere' (Nielsen, 2003). Shenk was the first to call it smog: 'Data smog gets in the way; it crowds out quiet moments, and obstructs much-needed contemplation. It spoils conversation, literature, and even entertainment. It thwarts skepticism, rendering us less sophisticated as consumers and citizens. It stresses us out' (Shenk, 1997: 31).

Yet to discuss information pollution is likely to contribute more of it. Also, it is subjective: information pollution fouls one person's thought, not everyone's waters. Above all, because one person's signal is another person's noise, it is much more difficult to agree on what is a common, noxious nuisance. The ethical questions raised differ from both those of free speech and those of clean air. Many of these concern whether information glut declares itself, and allows people to opt out (Greenfield 2004). The ethical questions can seem more culturally biased, as in what makes a society with many implicit forms of common sense much more pleasant than a nanny state with many explicit rules preventions. So how can

it be shown that glut fouls conviviality, which per Ivan Illich (1973) is all that which occurs socially without need for overt information? Such questions tie into ethics, politics, rhetoric, and other such fundamental categories in philosophy. It is a lot easier just to keep building, buying, and consuming more information feeds.

3. Contextual Practices

Third, then, this essay asks where current practices and common wisdom in the young field of interaction design show environmental awareness of any kind. Where might designed embodiment in ambient information actually increase awareness of the many issues raised? Such general questions seem warranted in a field where the pursuit of calming is a given (Weiser and Brown, 1997). It is the goal of this essay to provide intellectual background and future questions to that sensibility, and not to survey current practices in detail. How do context-sensitive design practices, which already emphasize symbolic environments, now make the step toward ambient environments?

Interaction design has to be intrinsically environmental at some level because it expands the symbolic context of actions. Since its inception, the field has looked at data input and output in relationship to interface form and structure. It has looked at tasks in relationship to work-flows and organizations. It has looked at architectures of access. More recently it has looked at socially networked frames of reference, especially amid habitual and even institutional contexts. And now, as in the focus of this volume, it is looking at physical embodiment in urban space.

Something about urban computing shifts the disciplinary emphasis from equipment to perceptions. It replaces a bias toward adding ever more tools and technological features with a quest toward a sensibility inflected toward maintaining some cultural commons. It differs from larger and necessary agendas in 'eco-tech,' that is, embedded information systems for improved resource economy, especially in building technology. It emphasizes proximity of particular people and annotation of particular places. It admits that knowledge of how to inhabit a city may be lost in the rush to personal entertainment. Indeed, distraction may be the state on which it must operate. The ethical issues at hand are those of distraction.

As the literature of urbanism has long emphasized, individuality in places that are of interest to particular inhabitants produces a cumulative urban experience, such as the experience

of districts. The personalization of mobile media feeds does not produce this cumulative experience. This has often been understood though psychogeography. Physical experience introduces aspects of orientation, memory, and territory, largely because the body imposes a schema on space. While these do increase the sense of being in the world, the question arises whether they reinforce or interfere with existing senses of embodiment and environment. On the other hand, new techniques of embedding, touch, and diversified display formats introduce a new domain of using the world itself as an access structure. In contrast to more innate relationships of body and memory, this new domain invites a more exploratory and less territorial approach to spatial mental mapping. That is because the world is now so much more overlaid and annotated with cultural productions of different spatial ordering. This much-championed hybrid introduces challenges of 'findability' (Morville, 2004) to which disciplinary approaches are quite different from the conventional literature on cognitive mapping. Thus new relations of embodiment, tangible interface, and ambient information increase the environmental implications of interaction design in two complementary ways.

On the one hand, the discipline could increase its concern for shifts in focal attention. Early interaction design carefully studied focus amid tasks. Pervasive computing began from the introduction of peripheral attention (Weiser and Brown, 1997). The ambient is a continuum of possibilities for focal shift. Information theorists contend that complexity and emergence become central to any study of awareness amid ambient, noisy, glutted communications. 'When information is understood as a process rather than a product, the line separating it from noise is difficult to determine,' Taylor explained. 'The interplay of noise, which is informative, and information, which is noisy, creates the conditions for emerging complexity, which is the pulse of life' (Taylor, 2001: 123).

On the other hand, the need to tune and personalize one's range of focal possibilities becomes a central strategy of information anxiety management. This challenge was evident to Wurman twenty years ago, but it has accelerated, and in doing so it has implicated more contexts. The discipline might now read 'almost unconsciously' as 'embodied, haptically-oriented, socially cued.' One key to the ambient is the increasing belief that much mental activity does not rise to the level of conscious deliberation.

Thus the overall social and practical contexts of action have become much more central to interaction design, and often surpass matters of mechanical or workflow-oriented usability as the key success factor. This makes the field more design-oriented. What one chooses to take on as subject matter matters as much as how efficiently that is engineered. For subject matter beyond the graphical user interface, the discipline works on product-service systems, neighborhood technologies, material and energy flow representation, and more. Because waste is almost intrinsically ugly, exposing and correcting it is a cultural, and not merely

moral or economic act. Environmental description, advocacy, and education allow more people to understand and shape such policy. Criticism suggests that these are cultural acts. Hopefully this issue provides a review of many such projects. To see the change, one need only consult a CHI proceedings of ten years ago, when it was widely thought that only the virtual would count.

4. Toward New Genres

Fourth, the invitation here is to develop terms and criteria by which to give more discernment and design authority to these implicitly environmental computing practices. And the philosophical question is whether those design experiences cultivate (for a highly networked generation, many of whom seldom played outdoors as children) a sense of connection to the physical world.

The first step is to demonstrate that locality is more than location. Proximate networks and not just GPS coordinates become the basis for locative media work. Locality and participation seem key to many an emerging green economics. How does interaction design become valuable to this?

Orientation to the physical everyday came first to history and letters. In the humanities, environmental criticism generally has origins in literary studies. Most university courses on environmental criticism concern literature first, and perhaps the high visual arts. Even without 'media,' a traditional culture created its environment mythologically; modern environmentalism might trace its origins to Virgil. Literature can blur distinctions among mythology, politics, environment, and perception. Was Mark Twain, educated as he was by the river, an early environmentalist?

However, in recent decades, literary studies have often divided over environmental criticism. To the relativistic language games of postmodernity, any insistence on worldly referents seems naïve, and any insistence on a master narrative (e.g., planetary change) demands opposition. Even spatial disciplines such as architecture long followed this literary lead. A better lead, however, appeared in cultural landscape studies. These ask how a society's values may be known as much from its settlement patterns as its literature or objects of art. Much of this has been directed to the macro scale, and sprawl, especially in America. But where it crosses with social history of technology, a useful genre of environmental criticism emerges.

For example, this is evident in the parallels commonly drawn between pervasive computing and early electrification. It is the ethnographic perspective of some of this work that makes it relevant to interaction design. For example McCarthy's 2001 study of ambient television looks at the influence of information pollution (our term, not hers) on gender roles and the spaces of conviviality and travel. As more kinds of ambient information technology become similarly normative, and no longer principally a technical challenge, surely they invite such similar critique.

This is mainly a matter of building a culture. That perhaps begins with awareness of context. Only with a conversation that is accumulated and perpetuated does the larger body of work acquire enough coherence to warrant criticism. The word 'criticism' implies familiarity with the issues, and how to reconsider what you have been thinking anyway. For instance the original Macintosh was described as the first human-computer interface that was good enough to criticize. With design for embodied, tangible, and diversely displayed information, is pervasive computing at last good enough to criticize?

One of the must fundamental sets of categories for critique has been introduced by Borgman (1999) as information 'about,' 'for,' or 'as' the world. Information 'about' the world characterizes much pre-modernity. Even biologists concentrated on descriptions. Information 'for' the world implies also some generative understanding, and is the main work of design. Modernists are notoriously spotty at seeing how things are because they are so busy imagining how else things might become. That begins an environmental disconnection. Then there is information 'as' the world, 'a deluge that threatens to erode, suspend, and dissolve its predecessors' (Borgman, 1999: 2). Herein lies the main environmental disconnection. Media-saturated people somehow become reality-challenged. Realism involves making sense of information types, especially in relationship to unmediated objects, structures, and surroundings, especially those that cannot be turned off, put away, or ignored.

Here let us limit the scope to information in environments, neither just describing them elsewhere like stories and maps, nor becoming them virtually like games and cinema, but, ubiquitous and embedded from within, engaged at annotating, operating, identifying, linking, recording, embellishing, polluting, populating, and filling the peripheries of what the best philosophers agree upon as reality.

Afterword

Under philosophical shifts required by planetary change, environmental critics no longer oppose environment and culture, nor conflate environment with nature. Instead the critical challenge has becomes to recognize the origins of crisis, and prospects for change, in cultural attitudes toward any and all concepts of environment in which humanity plays a part. This includes built environment, managed biosphere, information sphere, and ambient cultural experience. How each of these disposes people to understand their place in the world now demands exposition. Bio-centric forms of environmentalism may always lead the way; yet to make such abstraction accessible to more imaginations, culturally-centric forms must also play a role.

Information and environmental histories have not yet interwoven enough. Now, as information media become ubiquitous and interfaces become physically tangible and socially transparent, this separation may change. 'Environmental history of information' may no longer yield a null search on Google, as it did at this writing.

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Malcolm McCullough is associate professor of architecture at the University of Michigan. He has also served on the faculty of Carnegie Mellon and Harvard. He has written two widely-read books on architecture and interaction design – *Digital Ground* (2004) and *Abstracting Craft* (1996) – and has engaged in speaking and editorial review across a wide range of disciplines, from urbanism through applied arts to interaction design.

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