6 Greening Media Studies

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In this chapter, we argue that the contemporary eco-crisis challenges the foundations of media studies, which must find ways to become a greener discipline. As critical scholars, we cannot stand outside the realities of planetary decline, in particular when some of the very technologies we admire and study are significant contributors to the crisis.[1]

There is scientific consensus that humans are responsible for harmful climate change caused by the overproduction of carbon dioxide, that ocean acidification is destroying marine habitats, and that the planet is overdosed with nitrogen. Massive levels of conventional pollution are still a problem for the over-developed world and, as we've seen in the case of China, in the fast-growing economies of Asia too. The air poisoned by industrial processes exposes all life on our planet to risks of biological harm. The Earth's "sixth great extinction" is upon us, as tens of thousands of species become extinct every year, just as they did in five previous catastrophes (none of them created by humans, unlike this one).

Climate and environmental scientists have different ways of explaining the central problem of the eco-crisis, which is that a growth-obsessed political-economic order has crossed the line of sustainability: the balance between what the Earth can give to support human activities then safely re-absorb from them. This balancing function has been called the "scientific prerequisites for ecological sustainability," or more simply our "planetary boundaries."[2] According to the Intergovernmental Panel on Climate Change's 2013 report, today's growth-centered age of waste is inexorably disposing of the world and us with it.[3] As we ravage the environment, we are also creating 1.2 kg of "post-consumer waste" per person a day, or 1.3 billion tons of garbage each year. That figure has doubled over ten years and is now the source of 5 percent of all greenhouse-gas emissions.[4]

WHY SHOULD MEDIA STUDIES CARE?

Media technologies—from print to cloud computing—are intimately linked to the environment. Their components are manufactured from natural resources; the chemicals, metals, and gasses used to make them effect the

health of workers and ecosystems; their energy consumption is accelerating, with attendant rates of carbon emissions; and highly toxic discarded electronics are now the fastest growing part of municipal waste streams. This is the technology upon which media studies is predicated. Without it, we wouldn't have the content, institutions, or audiences that form the subject matter of our research and teaching.

Books on technology make up over a fifth of media studies titles available in the United States; but just a fraction of them connects their subject matter to the environment.[5] We shouldn't be surprised that studies of the physical medium, the technical means of communication, ignore the material origins of components. Media students and professors generally arrive at, inhabit, and depart universities with a focus on textuality, technology, and reception, but rarely address where texts and technologies physically come from or end up.

Media studies has a marginal subdiscipline analyzing media technology from a political-economic perspective, but relatively few scholars have employed an ecologically critical framework.[6] Another small subsection of media studies focuses on how the media frames global awareness of the transnational risks associated with climate change and other threats to the Earth's well-being. Many of them work with the International Association of Environmental Communication, which specializes in such questions and publishes *Environmental Communication: A Journal of Nature and Culture* (more on environmental communication below).[7]

But these attempts to green media studies are greeted with little fanfare, especially when compared to the fulsome joy with which the latest "new technology" is made welcome. For example, research about "creative industries" has much more traction, especially among the "new Right" of media studies, which invests in Schumpeterian entrepreneurs and evolutionary economics with unparalleled zest. These folks never saw an app they didn't like, or a socialist idea they did.[8] Innovation and the self-mythologizing of brand "upgrades" animate economic growth as new products and services destroy existing ones, with anyone left standing the beneficiary.

Media technology is proliferating in sync with this cybertarian rhetoric. Expenditure on consumer electronics alone reached US$1 trillion in 2012 and $1.1 trillion a year later. This matches overall annual spending increases of 4 to 5 percent on all information technology, which ended up to about $3.7 trillion by the end of 2013.[9] The major portion of this growth is sales of mobile devices. Experts on "new media" rejoice in the news that a full 90 percent of all currently existing data was created between 2012 and 2013 alone, thanks to the onslaught of personal, mobile recording devices and cloud computing.[10]

This breathtaking retail growth somehow appears to justify the hyperbole and technophilia that accompany it, making those of us who care about the environment look like chumps. Underlying this hubris is the absence of an eco-ethical curriculum in modern education systems: we are not asked

to reflect on our species' relation to non-human nature in any ongoing way as part of a culture of sustainability—except, of course, in our semiotic mastery of representing nature.

The world's biggest polluters remain the petro-chemical-electrical industries. They rank highest in the Political Economy Research Institute's 2013 *Misfortune 100: Top Corporate Air Polluters in the United States*.[11] Media companies seem lightweights by comparison—until you take into account the largely overlooked problem of electricity consumption and attendant carbon emissions that accompany the manufacture, distribution, use, and disposal of media technologies.[12]

Over 10 billion high-tech devices around the world need electricity today. Almost all these gadgets need to be plugged into the electric grid, while rechargeable batteries have energy costs as part of their production, usage, and disposal. According to the International Energy Agency, media technology consumes about 15 percent of the total global residential energy in use. Without any changes to this trend, the residential electricity needed to power this stuff is predicted to rise to 30 percent of global consumption by 2022, and 45 percent by 2030.[13]

Keep in mind that "residential use" refers to *operational energy,* not the energy consumed in manufacturing information and communication technologies. Energy used to make laptops, for example, is 64 percent of the total that's used in their life-cycles—and that does not account for the energy needed to make the chemicals and gases that go into producing semiconductors or dispose or recycle the things.[14]

When we connect the dots between our high-tech life-style and the power grid, including the electricity it takes to manufacture and distribute these gadgets, we see aggregate carbon emissions on a scale that matches the footprint of the aerospace industry. Our love of mobility can be credited for much of this rising energy consumption. There are nearly seven billion mobile phones in use worldwide today.

But we're not just talking about tons of people checking messages, looking up addresses, or following map directions. All that wireless connectivity consumes a tremendous amount of electricity, too. A recent study estimates that 90 percent of the total energy consumed by mobile connections is attributable to wireless access providers—not counting the energy used by the devices themselves. Another nine percent is attributed to data center energy use.[15] That nine percent doesn't seem like a lot until you consider that the aggregated electricity consumed globally by data centers—the core of today's cloud computing system—is somewhere between the amount India and Japan use annually.[16] That makes energy consumed for mobile connectivity one of the fastest growing contributors to atmospheric climate change.[17]

From the eco-materialist perspective that we favor, the intimate relation of media technology and environmental decline poses an urgent challenge to media scholarship. Whether we study mobile telephony, social media,

or the network society, the first step to greening media studies is to understand these phenomena in the ecological context in which they arise and operate. We must not forget that our high-tech subject matter comes into being at tremendous cost to the Earth's ecosystems and the biophysical health of its organisms.

WHAT IS MEDIA STUDIES DOING ABOUT THE ECO-CRISIS?

Clearly, not enough. Why? This neglect can be attributed to foundational precepts underlying the study of media technology, which focus on media as social and psychological influences, rather than environmental forces affecting physical realities in the biosphere. The conventional approach says the principal role of today's media is to inform, entertain, and involve the public, providing a grand conduit of knowledge and hence consciousness—a universal, devolved system of making meaning that transcends the centralized model of the mass media, transforming each consumer into a producer in the process. Information has been supplemented, and in some ways supplanted, by participation, with an emerging cacophony of democratic urges. The power of the mind is supposedly ascendant, thanks to the liberating role of media technology. The field is obsessed with consciousness, and while that's not a bad thing, it limits the way media studies thinks about the environment.

This cult of humanism admires the cultural devolution afforded by mobile technologies that generate millions of texts and address viewers and users as empowered. The humanistic idolization depicts new media technology as an enabler of human understanding, a tool for extending our capacities for expression and exchange.[18] The humanistic thinker emphasizes that technology is "a central character and actor in our social drama."[19]

Humanistic forms of inquiry have focused on themes raised in the content of texts and genres in the context of authors and societies, with a basis in rhetorical and novelistic writings from the principal Romance languages. Literary studies has provided a template through its claim to produce citizens imbued with national or cosmopolitan values. As a consequence, the history of printing has been largely peripheral to the study of English. Technological history has been a recent innovation for the humanities, largely through media studies or "digital humanities."

One example of this historiographical shift can be found under the rubric of media archeology, which in some versions aims to dig into human history to discover lost and forgotten inventions developed in parallel to or at cross purposes from the ones settled into our conventional, linear narratives of media development. The media-archeological method approaches present-day technologies from a different angle, radically adjusting our perspective to inspire us to create new art forms and novel

blueprints, diagrams, and codes for the future. Thus, this alternative promises new ways of interpreting familiar forms of innovation, experimentation, pleasure, politics, journalism, and civic life.[20]

But media archeology remains anchored to methodological and conceptual limitations of the humanities. First, the "dig here, not there" method avoids a more difficult holism that critical political economy employs to discover a much wider context for technological history and its discontents. Media archeology can generate lots of cool examples in the tales of lost or suppressed technologies, multiple timelines, and reconstructed memories, but these don't coalesce into something that we would call a new mode of historiographical inquiry into media technology. So, what's left conceptually is a metaphor of "archeology" that doesn't extend into the material work of real archeology to uncover the material past of media technology. That's unfortunate, because an archeological approach could be modified to include the ecology story of our technological past that is empirically, conceptually, and productively at odds with conventional media history.[21]

Overall, then, a deeper ecological materiality has eluded the humanistic knowledge of media technology, and continues to do so. What would happen to the humanistic approach if an ecological context were highlighted? Two humanities-based subdisciplines of media studies that already refer to the environment give us some idea of an answer. The one that has turned toward the problems of the eco-crisis and representation is environmental communication (mentioned earlier), which has made interesting forays outside of the humanities to try to understand relevant social, ecological, and psychological processes. The other one, media ecology, is more firmly attached to its humanistic roots and, consequently, continues to willfully think of the environment and the eco-crisis as peripheral to its subject area, even as it takes the metaphor of ecology as its distinguishing brand (like its younger cousin, media archeology).

Environmental communications has made major advances since its inception in the 1980s. Its primary focus is on how science reporting, environmental news, and other fictional and non-fictional forms of media representations of non-human nature, climate change, and related economic and cultural matters, including the influence these media have on public awareness of ecosystem processes and environmental problems. This emphasis on consciousness and rhetoric is important. We can learn a lot about how to increase public knowledge of environmental concerns, but not at the cost of research and teaching on the environmental impact of the media technologies themselves.

Some of these studies highlight problems within existing communication models. For instance, investigative environmental journalism cannot coexist—or does so uneasily—with professional journalistic routines, because, to put it bluntly, there aren't two sides to the story of climate change.[22] So any editorial pressure to seek "balance" will only generate a confused message. Unsurprisingly, research finding little to zero negative

environmental effects of media technology tends to be the product of corporate-financed studies. This research is part of the same "doubt industry" that disputes the legitimacy of evidence pointing to anthropogenic climate change. Hired "skeptics" work to muddy public thinking with the claim that there are two sides to the eco-crisis story. The most infamous example in the history of "war-gaming" science—attacking any evidence of harm—belongs to the tobacco corporations, who manipulated perception very effectively for many years, until industry hacks and the hacking coughers they cultivated could no longer deny that their products caused sickness and death.[23] Perhaps pressure from the doubt industry influenced the *New York Times*' decision to close their environmental desk in 2013—more positively, the *Los Angeles Times* decided not to print letters from climate-change deniers the same year.[24]

Additional studies suggest the problem originates in basic science education. It's a problem across the disciplines when children are not being prepared to comprehend the ecological crisis let alone understand even the most accessible forms of science journalism. Without a rudimentary education in environmental science, there are fewer built-in checks against appeals to emotion, which typically favor the side with the most money (read climate science deniers). That won't foster sustainable culture.

For those who study the influence of emotional appeals on public opinion, it's not well understood how political ideology connects to a person's propensity to accept climate science, take action, or endorse broad social solutions to the eco-crisis. Most environmental communications scholars would agree that media campaigns must account for preexisting biases and ideologies. We know, for instance, that Fox News Channel and the *Wall Street Journal* generally misinform the public about climate science, and much entertainment programming distorts the context, history, and social impact of climate change—when such themes are presented at all.[25]

Two recent psychological studies suggest that the effectiveness of such messages depends to a significant extent on how they resonate with liberal and conservative partisans. This might seem like another "duh" moment in the annals of science, like testing whether or not people feel happier when it's sunny rather than cloudy. After all, on the topic of environmental risk, the conventional wisdom (in the United States at least) is that climate change is a liberal concern, while conservatives attack the notion as hokum. But these studies show that the problem of ideology is far from settled.

Studies of the impact of "environmental discourse" in newspaper editorials and public-service announcements have found that the media primarily frame environmental risk through moral arguments about social harm and care. These resonate most effectively with liberals. When pro-environmental discourse shifts into the "moral domain" of purity and disgust, it resonates with conservatives. This suggests reframing pro-environmental messages to include both harm/care and purity/disgust moral cues to "reduce the gap between liberals and conservatives in environmental concerns."[26]

A recent collaboration between political scientists and neuroscientists in the United States and Europe raises related questions by examining the brain functions of liberals and conservatives exposed to risk-taking. Using functional magnetic resonance imaging, the research found that both groups are willing risk-takers, but liberals and conservatives differ dramatically in their brain activity when doing so. Conservatives activate the right amygdala, which is attuned to external threats and potential rewards. Liberals, by contrast, have greater activity in the area associated with social- and self-awareness. The researchers observe that "acting as a partisan in a partisan environment may alter the brain, above and beyond the effect of heredity."[27]

These studies suggest that political milieux structure how the brain's wiring can be altered within the echo-chamber of political beliefs. Conservatives' brains become hardwired to react in pro-environmental ways only when presented with repellent imagery of environmental disaster, because it elicits disgust or poses threats to bodily purity—contaminated water, toxic spills, smog-enveloped cities, and so on. Imagery that resonates more with liberals includes deforestation, habitat destruction, and drought-ravaged land. Cognitive linguistic research on environmental frames, ideology, and political partisanship offers similar results.[28] Such scholarship hints at new and interesting directions for environmental communication, though we recommend a strong dose of critical neuroscience to go along with this approach.[29] We would also question the liberal/conservative dualism, which might apply to the United States but not so securely to societies where governance and media systems tolerate greater political diversity.

Caveats aside, these studies offer one way environmental communication can understand how large groups of people come to think and act in a pro-environmental manner, taking into account political ideologies, moral cues, and neural processes. It may be a liberal brain that responds to the assertion that the ecological crisis and risks to human and non-human nature affect everyone. But that is also the scientific consensus, which makes the task of developing critical environmental communication all the more urgent.

The subdiscipline of media ecology, for its part, has done more harm than good with its defining metaphor of media environments, because media ecology's central metaphor is based on the false premise that social processes mirror ecological ones. As we've shown, media technologies have material relationships to the environment, but do not emerge or live like real ecosystems.

Yet the metaphor persists. As the introduction to this volume noted, it is guiding current attempts to define a "digital humanities" and shows up in the Pew Research Center's New Media Ecology project, which publishes research on emerging "information eco-systems."

Delinking our high-tech systems from their real ecosystem contexts in this way reinforces a dangerous ecological-amnesia. Perhaps just such forgetfulness is a precondition of a high-tech society, following on Arthur

C. Clarke's observation that magical thinking is central to techno-fantasies. It refuses to acknowledge that the proliferation of high-tech stuff is accompanied by ever-greater energy consumption, with attendant growth in carbon dioxide emissions. The rapidly accelerating turnover of old and outdated devices, fueled by planned obsolescence, has caused a surge of e-waste, now the fastest growing part of the junk we throw away.

Paradoxically, consumerism's planned obsolescence also reinforces the illusion that a new media technology modifies the conditions in which it is used, the guiding idea of media ecology (the medium is the message, and all that). Here the argument is that each new technology redefines the social and cultural relationships that earlier media helped shape. As the economic historian Harold Innis put it in the middle of the twentieth century, the "demands of the new media" are "imposed on the older media."[30] Old media are successively displaced by ever-new arrivals, delivering higher-potency versions of old content. Words and data are transmitted via telegraph and telephone; words, data, and music via radio; words, data, music, and images via film, TV, and the internet. The changes are not just in our experience and consciousness of content, but also in our experience and consciousness of pulsing and continuous waves of electromagnetic energy in various delivery devices.

All this adds up to a soft fetish for innovation that ignores the environmental destruction and centralized power that underpin it. As Marshall McLuhan put it, when "software information becomes the prime factor in politics and industry . . . suddenly *small is beautiful*."[31]

A sublime power of media technology seems to stoke the magical thinking of media ecology—a power heightened by the idea of a liberated consumer, which, like the commodity sign, provides no residual correspondence to a reality other than its own.[32] The techno-dream takes over the means of production, streaming onto computers of every size and resolution to realize not just the consumerist's dream of morphing into media makers and "prosumers,"[33] but also the marketer's dream of making them susceptible to a new mastery over their identities.[34] No wonder marketers delight in selling the historical achievement of the digital lifestyle as a "new TV ecosystem."[35]

CONCLUSION

Greening media studies begins by acknowledging an historic responsibility to face the challenge of the ecological crisis as a fundamental challenge to critical scholarship in the field. To ask what this has to do with media studies is to ignore the scale of the problems the world faces and the way technologies we use, study, and teach have contributed in material, rhetorical, and ideological ways. As we dig into the material conditions under which content and technologies are made, circulated, received, interpreted, criticized, and disposed of, we have found doing such work as uncomfortable and as paradoxical as the fact that environmental scientists and activists

must use high-tech, high-energy devices to undertake and disseminate research to prove how we must use less energy.

We have an incomplete list of what comes next for a greener media studies that begins and ends with collaboration:

Collaborative scholarship is necessary if we are to uproot the humanistic bias of media studies—this might include difficult cross-disciplinary work and dialogue, and even a few years of study in other fields. Teams of scholars and activists can work together to undertake eco-materialist studies on the life-cycles of media technologies and generate new curricula for discussion.

We have to collaborate to find inroads to influence policy documents discussed by public bureaucracies (international, national, regional, state, and municipal governments) and private bureaucracies (corporations, lobby groups, research firms, nongovernment organizations, religions, and unions) on media subvention, awards, raw materials, conservation, and recycling.

We have to contribute to debates (congressional/parliamentary, press, lobby-group, activist, and academic) pertaining to climate change, environmental policy, and green legislative reform.

We should be participating in bureaucratic discussion of budgets and accountancy. Follow the money to and from media corporations to press for more substantive environmental accountancy.

We have to collaborate to rewrite media histories to foil fetishism of the new and foreground the ecological context of the past. And this involves:

A broader international alliance of scholars, activists, and advocates who can contextualize their findings in ways that are particular and universal, place specific and globally relevant. This would be inclusive of all stakeholders, including non-human nature (how do such discussions represent *all* inhabitants of this planet?).

Media studies can be greener if we shun the unhelpful metaphors of media ecology, extend and strengthen research on green consciousness in environmental communication, and work across the humanities and sciences to establish points of alliance that help us understand how our digital wonders come at the expense of workers and ecosystems. As Harvey Sacks put it: "the failures of technocratic dreams" rest on the utterly banal idea "that if only we introduced some fantastic new communication machine the world will be transformed."[36] Media studies can either join in this banality or withdraw the welcome mat for media technologies that despoil the Earth and wreck the lives of those who make them.

NOTES

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