Audiences, Brains, Sustainable Planets, and Communication Technologies:
Four Horizons for the Rhetoric of Science and Technology

Carolyn R. Miller
Department of English, North Carolina State University
Raleigh, NC USA

These papers show us several horizons, one deep inside the brain, one beyond the ivory tower, and a third as wide as the ecosphere. All offer promising agendas, all challenge our habitual modes of scholarship, and all make me somewhat uneasy, in different but not unrelated ways. Possibly I'm simply not up to their challenges. In any case, this response may come across as curmudgeon-ish, but I offer it in the spirit of provoking discussion.

Ceccarelli: The Horizon of External Audiences, The Goal of Influence

Leah Ceccarelli challenges us to leave the *curriculum vitae contemplativum* for the *cv activum*. Perhaps we have nothing to lose but our ineffectual irrelevance, low status, and inability to procure external funding and thereby to participate fully in the twenty-first century research university and make our deans happy. Indeed, some rhetoricians of science have made important strides in this direction, several of whom were in the room with us during the panels (David Berube, Celeste Condit, Carl Herndl, Bill Kinsella). The changing nature of public support for higher education and the recent enthusiasm for "engaged scholarship" make Ceccarelli's challenge timely and relevant.

Those of us grounded in the humanities may be reluctant to undertake such engagement. Some time ago in a study of the characteristic topoi of literary criticism, Fahnestock and Secor (1991) identified the *contemptus mundi* topos, and I think it's fair to say that this topos infects much of the scholarship of the humanities, including that of rhetoric of science. Our characteristic positionality as critics, objectifying and evaluating the discourse of others, invites us to a kind of contempt, perhaps one of our occupational psychoses. Can we retain the critical position and lose the psychosis? Can we "shift from understanding to action" (Ceccarelli, this issue) and retain the critical position? Should rhetoric give up the critical position and adopt a more "affirmative" one (Muckelbauer, 2008)?

One mode of engagement with public audiences is what is often called "public intellectual" work. Nathan Crick (2006) has shown how difficult it has been to conceive of this work in a way that is rhetorically informed. Intellectuals, he notes, are usually "left with the unhappy choice of either sending press releases from the Ivory Tower or abandoning the tower completely for 'active participation in practical life'" (p. 130). His solution may not satisfy someone looking for any immediate "shift from understanding to action" (Ceccarelli, this issue). Conceiving of public intellectuals as "those who react to the problems of their sociohistorical situation by creating enduring works that broadly influence cultural habits and institutional practices," that is, by aiming to "change the world through the transformative power of ideas" (p. 131), Crick proposes that the audience for such work must be considered in the long term; thus, while an initial audience may be opinion leaders, the ideas "work their way into the culture over time . . . [and] begin to take on a life of their own" (p. 136), and their real audiences are not necessarily either immediate or proximate.

Many of us find the most congenial mode of engagement with broader audiences to be teaching, and those of us in departments of English play this role a bit differently from those in Communication because our teaching tradition has emphasized production over criticism, with our many courses in technical and scientific communication designed to help engineers and scientists become more effective communicators in their future professional roles. But the question we have always faced in this instructional setting is exactly the question at hand: where do standards come from? Do they come from *rhetorica utens*, that is, practices that may be widely used yet ineffective, or from *rhetorica docens*, that is, precepts and theories drawn from grammar, rhetoric, organizational communication, and elsewhere (Miller, 1989)? Academic inquiries into organizationally sanctioned practices often find that what is derided as "bad writing" is the rhetorically obvious result of power and status differentials or disparate professional cultures; these conditions make improvement in rhetorical performance difficult to achieve without social or organizational change (e.g., Brown & Herndl, 1986; Schryer, 2000).

By the same token, Ceccarelli points out that the two areas where we may have the most lasting effects—teaching and extradisciplinary service—constitute "unrewarded work" in the academy (this issue). The current pressures for accountability and outcomes assessment in higher education may produce the organizational change needed to reward this work, and such change could do more to reposition the humanities than any concerted effort by ARST.

Harris: The Horizon of the Brain, The Goal of Scientific Understanding

Randy Harris points us toward a horizon in the opposite direction: how to move from uninformed action to better understanding. The "snake-oil" of cognitive science will help us understand persuasion better, as distinct from the teaching tradition, which has spent a couple of millennia trying to help us "*achieve* persuasion" (this issue). This sounds benign: an

approach to understanding that looks to brain-work, rather than to contemptuous criticism or to a pedagogy of knacks. The brain provides the warrant for the claim of universality and thus for rhetoric as science.

Look closely at the way this argument develops: it hooks onto a figure, a metaphor of a fluid in grooves. Harris quotes Sapir to the effect that language "flows" in "well-worn grooves of expression" (this issue) however, his own claim is that "rhetorical figures operate in the grooves of the mind" (this issue). This turns Sapir's observation about the conceptual affordances of different languages into a claim that brings vividly to mind the grooves and folds of the human brain, a new and somewhat alarming form of rhetorical materialism, as the metaphor takes on metonymic power. Harris's examples are persuasive (and seem similar to Gestalt theory): repetition, edges, contrast, etc., are central to the human perceptual (and thus conceptual?) system, and linguistic expressions that flow in these grooves are more likely to be not just comprehended but believed.

Figure 1. The Brain. From Wikimedia Commons, http://commons.wikimedia.org/wiki/File:Human_brain.png.

And then what? If, in the pursuit of scientific understanding and in escape from weakly warranted pedagogy, we can establish rhetoric as cognitive and thereby understand it better (as a science), then we are faced exactly with the situation that Ceccarelli has presented to us: What do we do with this knowledge? It should inform our teaching, surely, and it should allow us to help ensure that correct judgments are formed about the true and the just (Aristotle, 2007, p. 1.1.12), particularly, in the present case, about scientific truths.

Harris acknowledges Plato's concern, "that being directed in a series of movements by the 'form' will get us moving with the 'matter' as well" (this issue), i.e., that we will become puppets in the hands of eloquence, or, perhaps, of glib hucksterism. But if "the form of signification profoundly affects the response of human organisms" (this issue), then the ultimate promise of cognitive rhetoric is that we can learn to use form to control other humans. This has been the rhetorical dream[1]: it's what some thought the sophists were selling. It's what the advertising industry and political campaign consultants are selling. My question is how distinct "the impulse to *understand* persuasion and the impulse to *achieve* persuasion" (this issue) can be. From knowledge to power is, as Francis Bacon saw, but a short step, and knowledge of the means to achieve persuasion is but a short step away from coercion. And this raises again the question about whether the distinction between basic and applied research can be sustained.

Harris assures us that he is not claiming that there are "laws of suasion" (this issue). But if cognitive linguistics becomes cognitive

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[1] Note to Harris: Sorry my intended irony wasn't apparent here.

rhetoric, if the science of rhetoric that Socrates outlined for Phaedrus finally becomes realized, how credible will that disclaimer be? Is any of this good reason for refraining from a research program? Can we ever justify turning away from knowledge? I'm not prepared to answer these questions, but only to suggest that Harris's research program should entail an equally ambitious inquiry into ethical obligations. Or perhaps, as I have speculated elsewhere, mutual knowledge of the mechanisms of influence will simply cancel out their power, leaving us trusting each other that much less (Miller, 2010).

Herndl: The Horizon of the Non-Modern and Post-Normal, The Goal of a Sustainable Planet

Following Latour, Carl Herndl focuses our disciplinary attention on problems of the greatest practical import: the sustainability of the global ecosystem, including human and other life forms. And he invites us to follow him into the kinds of collaborative engagement that he has been able to pursue at the University of South Florida. Like Ceccarelli and Harris, Herndl wants the work of ARST to make a difference in the world, but his particular proposal is that we "move from talking *about* science to *doing* science" (this issue). The trail he is blazing involves direct alliances with scientists in both institutional and intellectual senses.

Perhaps Latour is the right leader to be following down this trail, as he has directly engaged multiple times with the practices of scientists and technical people. And his work aims at both understanding and action, at talking about and doing. Perhaps Latour can maintain a stance of critical observation and at the same time intervene to improve the practices under observation. But I wish that someone would explain to Latour how the "uninterrupted chain of very small transformations" (Herndl, this issue) that achieve the miracle of reference and the alliances of quasi-objects and quasi-subjects that make reality are the result(s) of persuasion. And that rhetoric has some useful ways of explaining how those transformations and alliances get made.

Some who have worked with scientists and engineers on funded projects have found themselves unwillingly positioned as public relations agents, tasked with selling an agenda determined by others to a (sometimes justifiably) resistant public; this is a role where the critical position is not welcome—I've been in this position myself, as have others in this field. An NSF IGERT grant at my university (on which Bill Kinsella is a co-PI) focusing on genetic engineering and society involves humanities graduate students along with those in the natural and social sciences, but the rhetoric student in this program must guard against being cast in the role of logographer.[2] Projects like this that address problems of pest management, disease prevention, and ecosystem deterioration challenge our role as critics but offer the opportunity to bring rhetorical arts to bear in a consequential way. Such projects thus

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[2] For more information on the Integrative Graduate Education and Research Traineeship, see http://www.nsf.gov/crssprgm/igert/intro.jsp.

raise more questions: What should the curriculum be for an "embedded" rhetoric student, such as those who will be working in the School of Sustainability at USF or those in the IGERT program at NC State? Who sets research agendas? Can we and should we maintain a distinction between basic and applied research?

In research settings such as these, Ceccarelli maintains that ARST scholars have something distinctive to offer: "improved public communication of science and technology" (this issue). But Herndl's vision is different, offering yet another challenge to ARST. Although the set of questions at the end of the paper outline a challenging and productive research agenda, the citations demonstrate only weak connections to rhetorical studies. This may be our failing. However, it may also suggest that the research agenda is one for "science studies" more broadly and not one for ARST particularly. If our aim should be to "*do* science" (Herndl, this issue), do we give up the critical stance altogether? Does rhetoric lose its identity as a distinct discipline?

Another Horizon

I was somewhat surprised that none of these papers mentions new communication technologies, since they seem to shape so much speculation about the future in other forums, whether academic, civic, or commercial. It seems important to put this set of phenomena on our agenda for the future. For example, the proposal for Alan Gross and Jonathan Buehl's collection-in-progress on *Science and the Internet* offered this rationale:

> …the Internet has utterly transformed the ways in which science is practiced, produced, and proliferated. But while rhetoricians of science have enlightened us concerning the structure and nature of the scientific article as it existed up to the end of the twentieth century, they have yet to come to terms with its twenty-first century counterparts, communicative forms evolving so rapidly that it is difficult to capture them in flight. (personal communication)

This collection contends not only that rhetorical forms of science are changing but that science itself is undergoing change perhaps as profound as the seventeenth-century scientific revolution, which took shape in the shadow of the printing press. Authors in this collection will be exploring changed boundaries between science and its publics, evolving scientific and public genres, new procedures of peer review, open access, data visualization, new possibilities for public communication.

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