

State of the Art Twenty Years On:

**Reflections on the papers of Celeste Condit, Leah Ceccarelli, Lawrence J. Prelli,
Randy Harris, David Depew and John Lyne**

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“Looking back as well as I can at my character during my school life, the only qualities which at this period promised well for the future, were, that I had strong and diversified tastes, much zeal for whatever interested me, and a keen pleasure in understanding any complex subject or thing.”

Charles Darwin, *Autobiography*

Each of our papers is bullish on invention and each offers constructive ideas for how we might best focus our efforts to advance scholarship in the rhetoric of science and technology. Celeste Condit’s visual “Mind The Gap” (p.1) not only presages Lawrence Prelli’s reflections on the growing importance of visual communication in the rhetoric of science (Prelli, p. 4) but her warning of the space between where we are now and where we need to be to safely move our enterprise forward captures a theme common to all of our papers.

Celeste Condit, “Globalization and Purpose”

In her opening two sections (pp. 2-5) Celeste Condit worries about the direction of rhetoric of science studies—and equally or more so is she concerned about the state of the contemporary university and the forces that currently challenge it. David Depew and John Lyne note the symmetry between her call for unity within and the threat from without and respond with nuanced agreement in a larger context of concern for distance from overt partisanship and a reminder of the salvific Darwinian virtues of variety. (Depew and Lyne, p.11) Various themes even in the first, and more somber, half of her paper—concern to blunt anti-science sentiment in rhetoric of science studies, the need to better appreciate science and better integrate our rhetorical criticism with the methods of social science and expand our horizons—in principle seem negotiable through the persuasiveness of exemplary studies and greater internal dialogue. As for choosing one or another explicit path around which to organize our studies this is another matter.

Traditionally in our most supple art refusing stark choices in favor of negotiating contested boundaries has proven productive.¹ The same has been true in our recent disciplinary history. By the early 1990's what had seemed as clear alternatives for rhetorical criticism-- the ideology-focused program of Mike McGee and the close reading approach of Mike Leff--had developed into a constructive tension.² Michael Pfau's *The Political Style of Conspiracy: Chase, Sumner and Lincoln* is a good example of how the inventional strategy of bridging distinct perspectives can produce conceptual benefits greater than would have been possible from either perspective taken as an exclusive focus.³

In the second, and more ecumenic, part of her paper (pps. 5-7) Condit's concrete proposal for strengthening what has been an underdeveloped theme in our literature is easily compatible with the initiatives of the other papers. Condit proposes ARST scholars move beyond the Anglo-European context of most of rhetoric of science study, in which she graciously and forthrightly includes her own, to examine the rhetorical and social dimensions of science in Africa, Asia and South America. Citing the work of M. Parouske on Mbecki and the AIDS crisis in South Africa and of X. Xiao on the reception of Darwinism in China (p.5) she notes that a promising if small number of studies in our field have already pioneered this theme. Her suggestions for a global expansion of rhetoric of science horizons, and a closer integration with social science, seem to me timely, welcome and productive.

Condit's emphasis on the need to "notice continuities and discontinuities among the humanities, social science and natural sciences...." (p. 4) seems essential to the success of any rhetoric of science project. Her suggestion that we adopt a perspective aimed at "improving the richness of life for human beings while protecting the natural world around us." (p. 5) can certainly be an implicit guiding aim of our studies even if it is not the explicit given aim. The pan-world-perspective she favors would seem highly likely to occasion a changed understanding of how culture and nature reciprocally shape one another and to accelerate movement away from euro-centric supercessionist models of science, based on ever-receding memories of the enlightenment.

Stephen Toulmin gives an example, highly relevant to Condit's project, of the scientific development of "miracle rice" and how the Balinese government in the 1970's & '80's, with the advice of technical experts in Milan, Italy and Seoul, South Korea, discouraged the traditional farming practices associated "water temples."⁴ The traditional Buddhist practice of using "temples" to allocate water to local plots on a complex schedule developed over 800 years was abolished in favor a science based cost-effective procedure for making Bali self-sufficient in an important staple. But when within two years the fields were infested with pests and farmers had to buy ever newer and pest-resistant strains they pressured the government to return to the old irrigation system. The foreign experts recommended pesticide and regarded the protest as religious obscurantism.

In the end the water temple system was restored but on the basis of a compromise between the old system and the water needs of the newer strains of rice. In a way

invisible to western engineering, agriculture and economics the waterways and practices associated with the temples were part of “the material infrastructure of Balinese culture” and had “succeeded in minimizing the exposure of native crops to insects, disease, drought, flood and other natural enemies.”⁵ The moral of the story, as Toulmin notes, is not to decry science but, in keeping with what I take to be Condit’s point, to enable us, using multi-disciplinary perspectives, to attend to local culture, its language, rituals and context rich ways of knowing. Meera Nanda tells parallel stories of science and the modernizing process in India⁶ and Susan Jasanoff and her coauthors bring similar stories from Europe, America, Africa and the Caribbean.⁷ Anne Fadiman brings the theme of the science/religion/medicine/multi-culture interface close to home in her account of the interchange of Hmong and western medicine in California.⁸

Condit’s testimony to the inspiration she has received from encounter with scholars from other parts of the world interested in genetics is itself a powerful reason in favor of her proposal. Despite differences over how unified we need to be or how closely any particular research proposal should be linked to an overt political agenda her suggestion of a pan-world perspective melds well with the inter-disciplinary and horizon expanding thrust of all our papers. Seen in this light Condit’s proposal seems an excellent and still largely novel avenue for advancing Depew and Lyne’s recommendation that we encourage colleagues in science studies to make greater use of the resources of the rhetorical tradition while taking full advantage ourselves of the opening of the social-discursive turn in science studies. (Depew and Lyne, p.1)

Leah Ceccarelli, “To Whom Do We Speak? The Audience for Scholarship on the Rhetoric of Science and Technology”

Ceccarelli, like Condit, though for somewhat different reasons, is also concerned with the direction of rhetoric of science scholarship. Ceccarelli finds rhetoric of science and technology scholarship simultaneously flourishing and languishing. In her reading rhetoric of science scholarship is flourishing in that its number of publications is expanding, indicating that our enterprise is succeeding in attracting new generations of scholars and that they are getting published; at the same time it is languishing for considered either as an aid to scientists or as a form of intervention in public sphere/scientific and technical sphere disputes our scholarship seems to have taken a purely reflective turn. In Ceccarelli’s analysis rhetoricians of science want to understand the rhetorical dimensions of science—but they seem to speak and write primarily to and for themselves. As toward what end their studies are directed—it seems they regard understanding as its own end (pp. 2-3).

The great irony of rhetoric of science scholarship in Ceccarelli’s view is that many of our authors see their work as relevant for science and important for society but have little track record when it comes to bringing their insights to either scene of action. Ceccarelli’s concern is with our failure thus far to fulfill what, by our own internal and apparently near unanimous consensus, is part of our potential. At very least, perhaps on the principle that charity begin at home, she would also like to see rhetoricians of science

take our pedagogic mission seriously and study how we might advance the rhetoric of science by learning to teach it more effectively (pp. 5-6).⁹

All three of Ceccarelli's concerns, more active participation in collaborative work with scientists, a presence in scenes of science/culture tensions and transactions and disciplined reflection on our pedagogy seem abundantly justified. Ceccarelli's paper especially in light of her concluding paragraph (p. 6) is as much an agenda for the immediate future as an indictment of the present. The assessment Ceccarelli offers is not that we have taken a wrong turn or need to prune, purge or reorganize. Our problem is that we may flourish our way into respectable irrelevance—a standard charge against most academic fields. This is a very different problem than that faced by the founding generation.

To toss back David Depew and John Lyne's playful metaphor about our divinely inspired origins (Depew and Lyne, p. 2)—when the revelation was given we were the Mormons of the academy. To hear from one of our most distinguished second generation scholars that we are in danger of becoming just another establishment means that we have crossed, or are in the process of crossing, a very significant disciplinary divide. In principle we face a far more welcoming and more tractable, set of problems than was earlier the case. In Darwinian terms Leah Ceccarelli has identified the niches to which we aspire but do not occupy—at least not yet.

Ceccarelli's concern, as I have noted, is more than that we are not having the practical impact we clearly believe that we should. Even more importantly she points out that the disconnect between the significance we see in our findings and the world of practice shows that our endeavor has a significant potential that we have yet to realize. Curiously in our review twenty years ago of the rhetoric of science literature my history of science colleague Keith Benson and I found the potential for practical engagement a common thread among authors with otherwise distinct thematic emphases: "the deepest and most potentially unsettling implications of the rhetoric of science movement are the political and pedagogical ones; and on these the affinities among Fuller, Gross and Prelli are greater than their differences."¹⁰ This is a larger topic than we can discuss here but the symmetry between this observation and Ceccarelli's concerns indicate how deeply rooted are her themes in the original logic of the rhetoric of science and technology project.

So why are we not more bold and more actively engaged? Given that all our papers agree that we are an inherently inter-disciplinary endeavor it takes neither unwarranted optimism nor prophetic power to entertain some confidence that whatever we may currently lack we are capable of evolving. Ceccarelli's comment, for example, on the prospects for work with medical professionals on health communication indicates one arena where the fit between our work and a specific scene of action is particularly strong—and where the current disconnect could be turned into a mutually productive working alliance. Given that Stephen Toulmin has been one of the sources of inspiration for rhetorical scholars throughout the second half of the twentieth century, and for the rhetoric of science in particular, what Toulmin and Jonsen did for medical ethics in

relation to professional philosophy could be reinvented in a way appropriate to the rhetoric of science and technology.¹¹

The thrust of Condit and of Ceccarelli's combination of critique and proposals for new directions suggests we may be but a few variants away from developing and occupying niches involving both advances in theory/understanding (including self-understanding) and in practice. In the work of Condit, Karanen, Prelli and from what I understand from our colleagues in environmental rhetoric the kind of collaborations and presence in scenes of action Ceccarelli calls for are beginning to occur. Our remaining papers provide further evidence that the mutations needed for our future expansion may already be in place.

Lawrence Prelli, "The Prospect of Invention in Rhetorical Studies of Science, Technology, and Medicine"

Lawrence Prelli's summation of the state and direction of rhetoric of science scholarship advances the analysis of invention and innovation common to all our papers. Prelli's paper sketches a field grounded in tradition, building on its prior achievements, expanding to new areas of study and civically engaged. Prelli sees no crisis facing our studies but only the need to further augment an enterprise that has already proven its capacity to critique scientific texts, illuminate their persuasive dynamics and develop new insights by refining its multi-faceted angles of vision. Prelli organizes his account of the rhetoric of science, technology, and medicine primarily, though not exclusively, according to *Invention, Style, the Burkean arsenal, Argumentation and Commonplaces*. Though Prelli's general canon-centered account initially sets to one side the issues currently challenging rhetoric of science and technology study which variously concern Condit and Ceccarelli, at various points of his narrative these issues break through almost on their own.

Prelli's opening paragraph on invention in which he draws on the recent work of Joanna Hartelius and before her Floyd Anderson and Charles Kneupper, underscores that intellectual home of rhetorical study is invention. For Prelli as stressed also by Harris, Depew and Lyne, rhetoric is a knowledge-generating enterprise. A careful reader can clearly see that the formal analytic approaches in the rhetoric of science technology and medicine Prelli sets forth is not a list but an argument and a scholarly agenda for reversing rhetoric's reputation as a handmaiden, whether of philosophy or science, and for aggressively presenting it as a source of conceptual innovation and advance in science as well as in practical reason.

In his second paragraph Prelli mentions his own current work-in-progress on competing visions of ecology in the early twentieth century and the different metaphors which grounded them. Particularly intriguing in his comments on the interplay of various of Burke's master tropes operating in this discourse is their power to reveal "the imaginative origins" of what later came to be regarded as technical perspectives—indeed as mere data. Prelli's project of raising to life dead metaphors and to set before our eyes how they were not, after all, inevitable but imaginative possibilities in an initial scene of

contestation promises to expand our understanding of the heavy epistemic work done by “style” in technical science and its inseparability from argument.

Shifting to dramatism Prelli briefly notes the area is underdeveloped but cites work by Meisenbach and by Beck to demonstrating its utility in illuminating the discourses of medicine. Turning to argument in general irrespective of whether informed by metaphor or Burke’s master tropes or dramatism Prelli notes how recent work by Keranen and by Wynn shows the how argument has “participated in the establishment and change of sciences historically.” (p.3) Moving beyond the enumeration of studies by canonical or Burkean type Prelli notes the emerging interest in the rhetoric of visual displays and cites the current innovative work of a number of rhetoric of science scholars. Though Prelli does not use the canonical term “delivery” he highlights the increasing importance particularly in an age of computer generated visuals and graphics of science as performance.

In his account of “commonplaces” Prelli shows himself as concerned as any of our panelists with the cultural context in which rhetoric of science scholarship now finds itself. Where Condit sees a threat from unnamed outside corporate forces Prelli comes close to naming them and sees them already in the upper administration using innocent-sounding technical sphere terminology to compromise or privatize public education—particularly liberal education (pp. 4-5). That Prelli makes no special point about the efficacy of rhetorical analysis as critical therapy for the disorders of the day suggests how securely for him the rhetoric of science is, of course and already, a civic art with a public responsibility for critique. Prelli and Condit then alike see a role for engaged scholarship in the rhetoric of science a view also shared by Ceccarelli. This places their view in tension with the more cautionary temper of Depew and Lyne (Depew and Lyne, p. 11) and shows a common recognition that rhetoric of science study inevitably—and consequentially for its future credibility--abuts politics.

Prelli’s final segment on interdisciplinary engagement parallels themes of Condit and Ceccarelli but unlike them, he raises no issue of a need respectively for change of direction or faster realization of an acknowledged goal. If I read him correctly Prelli sees the rhetoric of science and technology playing an increasing role where the public and technical spheres intersect. This increased role presumably will occur as the interdisciplinary associations made in pursuing our studies and the sheer force of their pertinence create opportunities of their own.

I note a tension between Prelli’s formalist terminology whether from the traditional rhetorical canon or from Burke, and the situation-rich approach that Depew and Lyne find so potent a strength of rhetoric of science study. Prelli, for example, speaks of two approaches to invention one based on style the other on argument (p.1). A formalist armamentarium, whether classical or Burkean and an analytic approach grounded in the situated particulars of argumentative contexts can and do go together. (Bringing them together, of course, requires practical judgment and rhetorical/critical art.) In his previous work and in his current paper Prelli shows how argument and style

work cooperatively. Why then speak of them as though they were two different types of study?

My point is that we need to be mindful of our own tendency, following what I believe is an unfortunate legacy both of modernity and of the rhetorical tradition itself, to separate argument from style. If in fact they are functionally separate, as Prelli's typology of studies would indicate, why do we as a field tolerate a separation that works against our strenuous efforts to abolish the modernist form/content dichotomy that has made it so difficult for the cognitive force of invention to be recognized? I am merely repeating here the point Mike Leff argued nearly thirty years ago in "Topical Invention and Metaphoric Interaction."¹² Mike began his essay with a citation from Burke's *Rhetoric of Motives* "the Aristotelian topics shift so imperceptibly between ideas and images that you wonder how the two realms could ever come to be at odds."¹³ Two pages later Mike uses a metaphor to deliver one of the best, and most argumentatively cogent, lines of his essay: "topical method enables us to anticipate and appreciate a denouement; metaphor gives us a seat in the theater."¹⁴ As the work of Fahnestock and Prelli each has shown style and argument are integrated on the level of practice. To advance the case for invention that in this paper and in his earlier and on-going work Prelli so well articulates we need to place the tradition which separated these approaches (even in our discussions of them) on a path toward extinction.

Randy Harris, "The Rhetoric of Science Meets the Science of Rhetoric"

If our first three papers were not evidence enough Randy Harris' proposal of a science of rhetoric shows a field grown so confident from its studies of the role of rhetoric in science that it now aspires to become a science in its own right! Though Randy modestly notes he is not the first to come forward with this proposal and that what he does not owe to Aristotle and David J. Hill he owes to Kenneth Burke and Jeanne Fahnestock, and before them Hesiod, Gorgias and Plato (Harris, pp. 1-2) his suggestion seems to me productive and opportune. While Depew and Lyne warn against being too quick to get aboard the bandwagon of "behavioral and cognitive genetics" (Depew and Lyne, p. 7) the general proposal that Harris offers drawing as it does both on his home field of linguistics, on the ancient psychological preoccupations of rhetoric, and more broadly on a general evolutionary framework, seems timely rather than trendy.

Darwin himself founded the naturalistic study of rhetoric both in *the Descent of Man* and in its companion volume *The Expression of Emotions in Man and Animals*.¹⁵ No less a giant of rhetorical scholarship than George Kennedy opens his *Comparative Rhetoric* with a chapter entitled "Rhetoric Among Social Animals." The chapter includes sections on "Lying, Deception, Veracity, Deliberative, Judicial and Epideictic rhetoric and Arrangement and Style in Birdsong."¹⁶ When we add to this the recent work of Jonathan Haidt whose empirically based social intuitionist perspective promises to unite both the traditionalism of Isocrates and the rationalism of Aristotle in a perspective which relates and delimits the considerable merits of each we have the makings of a very potent combination of the science of rhetoric and the rhetoric of science.¹⁷

That aspects of rhetoric, particularly those situated at the nexus between rhetoric and psychology that Harris notes and that Fahenstock reviewed in detail in her examination of the literature,¹⁸ and that Haidt examines in his experimental studies of persuasion, could be organized as a science—with numerous sub-specialties of its own—seems indisputable. Harris’ elegant analysis of Burke seems to be an example of the very science for which he calls. To a considerable degree such a science already seems emergent—if not yet officially named or organized. Not only could a science of rhetoric address the kinds of rhetorical/developmental questions Harris poses, but would extend and complete Kennedy’s naturalistic rhetoric project. The development of an explicitly scientific branch of rhetorical study would also be, dare I say, of great *rhetorical* value to those of us who would remain within the humanistic orbit.

Who among us while on active duty in oral or written composition classes, or when put to it by colleagues in higher pecking order disciplines, has not appealed to the authority of Aristotle to commend the worthiness of our art for a hearing? Of how much more value would it be to point to the latest findings of rhetorical science? But, of course, when it came to teaching rhetoric our open trade secret would remain that in the classroom—whether it be in public speaking or composition--we are all Ciceronians. Again as Mike Leff never tired of pointing out in his favorite passage from Quintilian a scientific understanding of the topics would be in danger of yielding “what I can only call a dumb science (*mutam quondam scientiam*).”¹⁹ It is not for nothing that the Isocratean/Ciceronian synthesis has defined the rhetorical tradition and that Aristotle has never been other than a philosophic Polonius—except rhetorically—throughout it.

None of this is news to this company and none of it is meant as a “gotcha” to Randy’s welcome and well argued proposal. Of course the business of those of us who teach rhetoric is to facilitate the conscious emergence in our students of the capacity for deliberation not to teach them a science of rhetoric. The emergence of such a science, however, might actually facilitate the development of a more productive relation between rhetoric and science. First, if the science emerged—consciously named and with all the pride, pretension, and jealousy of an academic discipline--the rhetoric of rhetorical science would be a prime topic for humanistic/historical study.²⁰ Second, the emergence of such a science might actually help change the historical tension between science and the humanities by revealing a permeable boundary where the determinism/indeterminism of nature leaves off and the indeterminism of culture and human/animal assessments of context begins.

As one reads Jeanne Fahenstock’s “Rhetoric in the Age of Cognitive Science” it is not difficult to see topics where humanist and scientific rhetoricians could meet. Is it too much to hope that the appearance of a science of rhetoric might change the rhetorical reductionist inflection of much post-modern thought and the anti-science tone Celeste finds offensive in much rhetoric of science study? If there were a science of rhetoric what would then be the point of reducing the science of rhetoric to *mere* rhetoric? It seems to me more likely that a science of rhetoric might establish a scientific foundation for the process of deliberation itself—which means science would underwrite a bounded

determinism which (given various Burkean Joyceings) could serve as another name for the open horizon of history central to the humanities.

David Depew and John Lyne, “The Productivity of Scientific Rhetoric”

Many of the topics addressed in “The Productivity of Scientific Rhetoric” are presaged by Prelli and by the emphasis both Prelli and Harris give to the analytic cash value of the rhetorical tradition, especially invention, and of Burke’s pentadic and master tropic riffs upon it (Depew and Lyne, pp. 2-3). The concerns of Condit and Ceccarelli that our scholarship have an impact are also addressed by their paper. What is distinctive in Depew and Lyne is their compact summation of the unique situation, challenges, and horizon of opportunity in which the rhetoric of science and technology now finds itself.

In the assessment of Depew and Lyne we are happily located between more established disciplines—and find ourselves at a most opportune moment. Given the turn away from emphasis on logic and mathematics in the history and philosophy of science and toward discourse and culture in these same studies our historical focus on audience and rhetorical choice could not be more timely or potentially consequential. No less than their lay counterparts scientific audiences respond to rhetorical choices “embedded” in scientific discourse. Style and all the elements of the rhetorical armamentarium, far from being decorative or of the surface, are epistemic and productive of scientific knowledge. In the view of Depew and Lyne if we have but the wit and restraint to make the most of the combination of our traditional resources, novel position and historic moment we may be on the cusp of a significant disciplinary advance centered in invention.

Particularly important for their first section but in fact structuring their entire paper, are Depew and Lyne’s inter-related questions “whether the social-discursive turn in the study of science has taken full advantage of rhetorical theory and criticism” and “whether we rhetoricians of science have taken full advantage of the opening created by the broader discursive-social turn to articulate, deploy, and advertise our distinctive yet varied approach.” (p.1)

In answer to the first question Depew and Lyne find a close ally in Bruno Latour and see his billing of rhetoric in his studies of science as explicit and exemplary. But Depew and Lyne find Latour compromised by his inventional exuberance in enfranchising non-humans in a great parliament of deliberation. Depew and Lyne display a greater sense than Latour of the rhetoric of science as a performing art and in their assessment Latour’s problem is not knowing when to stop. His parliament of beings hyperbole has cast doubt upon his otherwise exemplary emphasis on context thereby blunting his message that there is an alternative to a radical social constructivism. A rhetoric of science performance which would build upon Latour’s strengths yet avoid his weaknesses would begin with a rich yet disciplined view of context and of the multi-faced character of argument.

That ARST rhetoricians have the where-with-all for an account of context even richer than Latour’s Depew and Lyne have no doubt. They list 16 different approaches to

ARST studies and—pointing with pride to what Condit views with alarm--suggest that a diversity of perspectives rather than programmatic unity will enable us to carry further forward what the best of our fellow travelers in other fields are capable of advancing only up to a point. “Rhetoric is opportunistic and unruly, and we cast our nets where we think the fishing is good.” (p. 2) To extend their theme of the disciplined use of a diverse but common repertoire—the rhetorician of science is not limited to being a purse-seiner but should aspire to be “the compleat angler” whose tackle box is well stocked with lures for a broad variety of waters, species, locales, topographic-hydrographic confluences and occasions.

Depew and Lyne’s assessment of the high promise of the rhetorician of science’s combination of opportunism, diversity of foci and disciplined knowledge of where and how to fish and when to cut bait, coupled with their sympathetic critique of Latour “leads us to the contentious claim that rhetoric of science contextualizes science better than does sociology of science, because the former tends to reduce arguments to context rather than defining context by argument.” (p.2)

Combining Burke’s pentad as a way of tracking agency with “Tom Goodnight’s threefold distinction between personal, technical, and public spheres of discourse—itsself a rhetorical reconstruction of Habermas’s theory of communicative action” (p. 3)-- Depew and Lyne prepare the way for the detailed support of their thesis in the middle sections (pp. 3--5) of their paper. One final point of framing places in relief the grounds of their confidence that the diversity of foci in the rhetoric of science is compatible with a rough unity in its overall explanatory ambitions. “If there is one theorem that we rhetoricians of science have sustained...it is that demarcation or boundary-work between science and society, between science, non-science, junk science and pseudo-science, and between various scientific fields themselves is irreducibly rhetorical.” (p. 3)

The demarcationist gospel, though a gift that promises to keep on giving for rhetoricians of science, is, as with its paradigmatic original, bad news before it is good news, sad news before it is glad news.²¹ Even when thoroughly understood the “essentially contested” character of demarcation is a source of on-going anxiety between and within Goodnight’s public and technical spheres. Depew and Lyne put the paradox of this good news/bad news, blessing/curse for rhetorical studies frankly: “the main implication of recognizing that demarcation is essentially rhetorical is both inescapable and difficult to hear even for some of its supporters.” (p. 3)

The difficulty, of course, is that a truly rhetorical perspective on science reveals that the well-advertised capacity of science to correct itself is largely mythic, at very least has glaring exceptions, and, at very best, is vastly oversold. Not only do disciplines leak at the seams, demarcation disputes are handled through cross sphere influences some of which are subtle and some of which are not—indeed for democracy many of them are downright embarrassing. To support their thesis that the public sphere has the ability to correct the technical sphere Depew and Lyne offer the example of the successful opposition of the Catholic Church in the ‘20s and ‘30s to eugenics. In their view the

vigorous public sphere opposition of the church “inspired criticism in technical ones that eventually destroyed the genetics arguments on which eugenics was predicated.” (p. 4)

Three things need to be said about this representative anecdote. (Perhaps “representative antidote” would be a happier term.)

First, the same example also legitimates public sphere religious opposition to stem cell research, popular skepticism of climate change science, belief that immunization shots in school lead to autism, popular interest in intelligent design, European skepticism about GMO’s, skepticism about AIDS research and a veritable pandora’s box of other examples of public sphere distrust of technical science.

Second, in the conceptual economy of the paper, especially in “Embedded Rhetoricity” (pp. 6-8) and “Inventing on All Cylinders” (pp. 8-10) confidence in the essential soundness of public sphere argumentation is necessary to blunt the “pessimistic induction” (p. 4) of post-moderns once they realize, particularly in the case of biology, how thoroughly rhetorical is the process by which this and similar historical sciences acquire knowledge. One has to have a very robust faith indeed in the essential soundness of public deliberation for Depew and Lyne’s instructive and deeply embedded rhetorical examples to work—that is not to be read as a form of deconstructing scientific authority but as reconstructing it on a deliberative/argumentational as opposed to a demonstrative basis. It is difficult to see how the eugenics example—even when boosted by their example of Martin Luther King’s call for justice--can do other than reinforce the “pessimistic induction” it is meant to allay.

Third to defend, philosophically robust public sphere contestation on topics on which the technical sphere has spoken—that is to do more than acknowledge a first amendment right to freedom of expression--is something that technical sphere representatives will almost certainly hear as the anti-science sentiments of yet another group of social constructivists and not as the voice of pro-science scholars who are also pro-democracy. Clearly such a charge against Depew and Lyne would be mistaken, but it is a misunderstanding to which their position, and that of our general endeavor, is open.

In sum Depew and Lyne’s essay, which expertly and inspirationally captures our moment and prospects, seems to rest upon a paradox—a paper that consistently warns against associating the rhetoric of science with political stances, itself rests on a political analogy. Their analogy between confidence in a justice and presumably good policy producing public sphere and the capacity of a technical sphere shaped by rhetorical invention and context-centered persuasive argument to produce good science seems dangerously close to what Steve Fuller, as opposed to Chris Mooney, has called “Republican science”—of which Depew and Lyne seem wary. In Fuller’s words “Republicanism represents the Ideal State in that it allows people to speak their minds with impunity.”²²

As I read their paper Depew and Lyne also seem to favor a science in which cross-sphere discussion and persuasion with and by “untutored publics” (p. 4) sets the

norms governing, or at least mediating, the personal, public and technical spheres. It would seem that Depew and Lyne's assessment of our historical situation is correct and they have done us the service of confronting us with its consequences. The autonomy of science on the positivist technical sphere model (arguably the model of James Conant's *Science the Endless Frontier*) and James Madison's parallel argument in the Federalist papers for the Constitutional separation of powers have enjoyed similar fates.²³ The fate of positivism is now commonplace. As Richard Neustadt says of the Constitutions' separating of powers. "It did nothing of the sort. Rather it created a government of separated institutions sharing powers."²⁴

Change "spheres" to "powers" and Depew and Lyne have described the constitution of public and technical policy formation in the post-positivist, postmodern world. Their suggestion that we focus our research on exposing the choice: either technical sphere independence or "pessimism, ... nihilism, and... pseudoscience" as "a false dichotomy"--they do not say that it is, but only that it "may be" (p. 4)--would seem to be more than warranted. It is difficult to exaggerate how much the ambitious and potentially productive research program they propose rests upon, to borrow Condit's image, minding the very considerable gap between current evidence and a convincing demonstration of public sphere rationality in addressing the excesses of the technical sphere—or in providing confidence in scientific argumentation once the rhetorical basis of that argumentation is made clear.²⁵

In answering the above closely related points Depew and Lyne are not without resource. Goodnight as they note develops a theme of Habermas who sought to imagine how the public/technical sphere boundary might be mediated. The complex pathways and reciprocal relations among the private, public and technical spheres suggests, as Depew and Lyne allude to them, various potentially enriching complications. But unlike Habermas who strives to filter out "distorted communication" through ideal speech situations which, through the premium they place on epistemic hygiene, threaten to bleach out, along with the germs, all naturally occurring color from the lay/technical boundary, Depew and Lyne sound very much as if they were of the opposite persuasion and were inclined to celebrate the messiness, complexities, with attendant risks to epistemic sanitation, entailed in the discursive ecologies of a rough and tumble rhetorical republic. Their example of the victory of the Catholic Church over eugenics, though morally justified, was an exercise in political power which seems to sanction a populist political model of how the public sphere/technical sphere might be policed. On the other hand, their view that this example shows how issues in the popular public sphere can "[inspire] criticism in technical ones" (p.4) could imply an elitist model of filtration—though I do not believe this interpretation captures the full complexity of their view.

By contrast Philip Kitcher, arguably the leading philosopher on the relation between science and democracy, shares Habermas' concern for strenuous regimes of public sphere/technical sphere mediation. In each of his two books on science and democracy Kitcher seems to favor specially constructed forums for lay/expert deliberation that, for the most part, our common political culture has yet to evolve.²⁶ For Kitcher, Depew and Lyne's eugenics example, and quite possibly my own previous views

on the educational merits of debate on Darwin and Intelligent Design, would probably be candidates for illustrating “vulgar democracy” of which, needless to say, Kitcher does not approve.²⁷ Kitcher’s aim, like that of Depew and Lyne, myself, and no doubt in common with most members of ARST, is rapprochement between the democratic ideal of deliberation in the interest of the common good (including the interests of the poor and marginalized) and the claims of truth. That Kitcher has written two books on virtually the same subject and in neither claims to have the answer to the question of the appropriate mediation underscores how challenging and timely are the issues which Depew and Lyne raise and how opportune, as they rightly stress, is the moment for inter-disciplinary studies exploring the inter-relation between the discourses of the personal, technical and public spheres.

Where To From Here?

We have in all our essays a stimulating set of proposals, a daunting, set of problems and some varied and potentially fruitful inventional resources. Perhaps Neustadt’s description of the institutional reality of the Constitution despite the common mistaken interpretation of it—sanctified by the Federalist papers no less—might possibly provide a useful analogy for rhetoricians of science to develop in buffering the shock that recognition of the inability of science to autonomously manage its own affairs and the necessary for its inter-action with popular opinion inevitably creates. At very least the ambiguities in Depew and Lyne’s eugenics example, coupled with its importance not only for their case but for analogous issues whether of gaps or intersections raised by Condit, Prelli, Ceccarelli and Harris underscore the need for ARST scholars to focus on democratic demarcations.

If faith in public sphere rationality common to the civic tradition of rhetoric is to prove justified in the era in which the rhetorical character of science becomes increasingly evident and commonly understood ARST scholars should be well positioned to understand the issues involved, help create the needed relations of mutual trust, and nurture personal, public and technical sphere contexts in which reasoned deliberation about science and its implications can occur. We have work to do. With some inventional skill and some active inter-disciplinary diplomacy I am confident that our society’s twenty year experiment in the rhetoric of science--which seeks in its own context to reaffirm and reanimate the aspirations of those august figures who thought a democratic republic would support science and the arts²⁸--will continue to specialize, diversify, and flourish.

¹ Probably the most famous example is Cicero’s refusal in *De Oratore* to disavow Aristotle’s *Rhetoric*, though in his own approach to the subject Aristotle’s preoccupation with whether rhetoric was an “art” was largely irrelevant. See Michael Leff, “Genre and Paradigm in the Second Book of *De Oratore*,” *The Southern Speech Communication Journal*, 51 (Summer, 1986), 308-325.

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- ² Michael Leff, "Things Made By Words: Reflections on Textual Criticism," *QJS*, 78 (1992):223-231.
- ³ Michael William Pfau, *The Political Style of Conspiracy: Chase, Sumner, and Lincoln*, (East Lansing: Michigan State University Press, 2005).
- ⁴ Stephen Toulmin, *Return to Reason*, (Cambridge: Harvard University Press, 2001): 60-61.
- ⁵ Ibid, 62.
- ⁶ Meera Nanda, *Prophets Facing Backward: Postmodern Critiques of Science and Hindu Nationalism in India*. (New Brunswick, New Jersey: Rutgers University Press. 2003).
- ⁷ Sheila Jasanoff. *States of Knowledge: The Co-Production of Science and Social Order*, (London: Routledge, 2004).
- ⁸ Anne Fadiman, *The Spirit Catches You and You Fall Down: A Hmong Child Her American Doctors and the Collision of Two Cultures*, (New York: Farrar, Straus and Giroux, 1997).
- ⁹ Though Leah is pessimistic about our efforts to take rhetoric of science pedagogy seriously, let alone to find publishers for our potential work on it there is at least hope. Our composition colleague Michael Zerbe has begun the conversation on a very promising note. Michael J. Zerbe, *Composition and the Rhetoric of Science: Engaging the Dominant Discourse*, (Carbondale: Southern Illinois University Press, 2007). See also John Angus Campbell, Rev. of *Composition and the Rhetoric of Science: Engaging the Dominant Discourse* by Michael J. Zerbe. *Rhetoric Review* 27.1 (2008): 102–107.
- ¹⁰ John Angus Campbell and Keith R. Benson, "The Rhetorical Turn In Science Studies," *Quarterly Journal of Speech*, 82 (1996): 89.
- ¹¹ Stephen Toulmin and Albert Jonse, *The Abuse of Casuistry: A History of Moral Reasoning*, (Berkeley and Los Angeles: University of California Press, 1988).
- ¹² Michael C. Leff, "Topical Invention and Metaphoric Interaction," *The Southern Speech Communication Journal*, 48 (Spring, 1983): 214-229.
- ¹³ Ibid, 214.
- ¹⁴ Ibid, 216. That Leff's essay makes use of an essay by the anthropologist Loren Eisely, to show the fit between topical argument and style (pp. 224-227) makes his point all the more appropriate for students of the rhetoric of science.
- ¹⁵ Charles Darwin, *The Descent of Man, And Selection in Relation to Sex*, Vols. 1 & 2. (London: Charles Murray, 1871), *The Expression of Emotions in Man and Animals*, (London: John Murray, 1872).
- ¹⁶ George A. Kennedy, *Comparative Rhetoric: An Historical and Cross-Cultural Introduction*, (Oxford: Oxford University Press, 1998),vii.
- ¹⁷ Jonathan Haidt, *The Righteous Mind: Why Good People Are Divided by Politics and Religion*, (New York: Pantheon Books, 2012). See also the illuminating discussion about Haidt's thesis in the New York Times section "The Stone." Gary Gutting, "Haidt's Problem With Plato," NYT Opinionator, The Stone, October, 4, 2012. <http://opinionator.blogs.nytimes.com/2012/10/04/jonathan-haidts-plato-problem/> and Haidt's response, Jonathan Haidt, "Reasons Matter (When Intuitions Don't Object)," NYT Opinionator, The Stone, October 7, 2012. <http://opinionator.blogs.nytimes.com/2012/10/07/reasons-matter-when-intuitions-dont-object/#more-135015>

¹⁸ Jeanne Fahnestock, “Rhetoric in the Age of Cognitive Science,” in Richard Graff, ed., *The Viability of Rhetoric*, (Albany: State University Press of New York, 2005), 159-179.

¹⁹ Michael Leff, “Up From Theory: Or, I Fought the Topoi and the Topoi Won,” *Rhetoric Society Quarterly* 36 (2006): 203-211

²⁰ Depew and Lyne note how conscious Dawkins is of the rhetorical character of his own science (Depew and Lyne, p. 10). Though he does not use the term *rhetoric*, Haidt is equally clear that his essentially rhetorical view of human cognition is presented/explained quite consciously through a series of common-sense images—i.e. his view of the mind/psyche as an elephant and reason as a rider. The conscious character of his own rhetoric is set forth in the later portion of his response to Gutting above. See note #7.

²¹ Frederick Buechner, *Telling the Truth: The Gospel as Tragedy, Comedy and Fairy Tale*, (New York: Harper and Row, 1977): 7, 23.

²² Steve Fuller, *The Governance of Science: Ideology and the Future of the Open Society*, (Buckingham: Open University Press, 2000):11.

²³ James Madison, “The Federalist No. 51,” in Alexander Hamilton, James Madison, and John Jay, *The Federalist Papers*, (New York: Bantam Books, 1982): 261-265. “This policy of supplying by opposite and rival interests, the defect of better motives, might be traced through the whole system of human affairs, private as well as public.” (p. 263).

²⁴ Richard E. Neustadt, *Presidential Power and the Modern Presidents*, (New York: Free Press, 1990): 29.

²⁵ On the other hand, were this difficulty to be overcome the result would have very significant implications not only for our understanding of science but of rhetoric itself. Stanley Fish’s celebrated account of rhetoric properly stresses the contrast between depth and surface, substance vs. insubstantiality. The success of the projects of Randy Harris and of Depew and Lyne would require a significant refiguring of this historic divide. Stanley Fish, “Rhetoric,” in Stanley Fish, *Doing What Comes Naturally: Change, Rhetoric, and the Practice of Theory in Literary and Legal Studies*, (Durham, North Carolina: Duke University Press, 1989), Chapter 20.

²⁶ Philip Kitcher, *Science, Truth, and Democracy*, (Oxford: Oxford University Press, 2001). On Habermas see note #2 p. 172. Chapter 8, “Constraints on Free Inquiry,” is particularly important to the present discussion, esp. 102-103. For a summation of his argument see “Afterward” pp. 199-201. See also: *Science in a Democratic Society*, (Amherst, New York: Prometheus Books, 2011). Kitcher’s account of “Actual Choices” Chapter 9 considers the controversies over the history of life, biomedical technology, genetically modified organisms and climate change.

²⁷ Kitcher, 2011, pps. 113, 126, 128, 140, 177, 220, 221.

²⁸ *The Constitution of the United States*, Article 1, section 8, paragraph 8.