Introduction to the Symposium on Engaged Rhetoric of Science, Technology, Engineering and Medicine

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The papers in this symposium on engaged rhetoric of science continue the existing conversation about how rhetoric of science, technology, engineering, and medicine (RSTEM) can engage with the ongoing work of science and its various interactions with the public and with policy. As the essays in the 2013 special issue of *Poroi* on the future prospects of RSTEM suggest when taken together, this is not a simple, straightforward, or unproblematic task. As that collection of essays also suggests, however, this is a pressing need and a promising opportunity.

In our current post-critical age, some scholars in RSTEM have sought to build different relationships with our colleagues in science and medicine. Faced with challenges such as climate change, revolutions in gene splicing, emergent diseases such as the Zika virus, some scholars have sought to "mind the gap," as Celeste Condit so nicely put it, between science and humanities in new ways (Condit, 2013). This is not wholly new, of course. Scholars such as Condit, Tarla Rae Peterson, Stuart Blythe, Jeffrey Grabill, Kirk Riley, Blake Scott, and myself have been working in this interdisciplinary space for some time (Condit, 2009; Peterson, 1997; Blythe *et al.*, 2008; Scott, 2003; Burkart *et al.*, 2005). Furthermore, the call for a more interdisciplinary and engaged RSTEM is only a localized version of the general move toward public or civic engagement in rhetoric. Drawing on the tradition of civic engagement and the idea of the public intellectual, a number of scholars have argued that rhetoric should be more engaged with non academic publics, with communities, and with political affairs (Hauser, 2006; Mailloux, 2006; Gunn and Lucaites, 2010; McGowan, 2010). My point here is not to minimize the shift implied in an engaged RSTEM as old news, but to suggest that it develops ideas that are central to our discipline.

If an engaged RSTEM is not an alien import, the exigency to redefine RSTEM's relationship to the work of applied or mission-oriented science has taken on a new urgency in the aftermath of Bruno Latour's manifesto "Why Has Critique Run Out of Steam?" and Harry Collins and Robert Evans' landmark essay on "The Third Wave of Science Studies" (Latour, 2004; Collins and Evans, 2002). Other scholars such as Donna Haraway and Karen Barad have argued for alternative models of science, for notions of agential realism, and for a more engaged practice in the humanities (Haraway, 1986, 1997; Barad, 1998, 2003, 2007). Haraway's "Cyborg Manifesto" in which she referred to "material-semiotic" things and called for scholars to help build a "more lively and more livable world," and her later metaphor of "refraction" as cultural and scientific change, are early versions of Latour's hybrids and his proposal that we take up matters of concern (Haraway, 1991, 1992; Latour, 2004). Powerful as their work has become, Latour and Collins and Evans are only avatars for a longstanding tradition in science studies. In 2002, Edward Woodhouse, David Hess, Steve Breyman and Brian Martin published a lengthy essay calling for a "*repproachement*" between what they call the activist and academic wings of STS. Their call for activist scholarship and political "partisanship" emerged from the longstanding recognition in STS that technologies are socially constructed and from their desire to guide technology development toward more inclusive, democratic and egalitarian ends. Despite this activist dialogue within STS, I take Latour and Collins and Evans' work here as watershed moments primarily because of the influence their work has had in contemporary RSTEM.

Latour's theory of the non-modern and his redefinition of the role of the critic articulate an alternative understanding of scientific practice and of our potential relations to it that is as compelling as it is synoptic. Latour's notion of the nonmodern, articulated most clearly in *We Have Never Been Modern,* rejects the grounding modernist distinction between subject and object and, more to the point for science studies, between an ontologically pure realm of nature and another ontologically pure realm of culture (Latour, 1999). For Latour, the world is populated by hybrid phenomena that are the "quasi-objects" and "quasi-subjects" about which Michel Serres writes and which emerge from the heterogeneous networks of humans and nonhumans which science builds and which Latour traces so carefully (Serres, 1982). For Latour, the work of the critic is no longer to use deconstruction or critical theory to dismantle the traditional notion of science with its claims to objectivity and truth, but the project of bringing together people

and things over what he calls "matters of concern" and "states of affairs" which supersede the modernist fascination with "matters of fact." Latour's critic works to compose a common world and to distinguish "those attachments [and networked associations] which save from those that kill" (Latour, 2010).

Similarly, Collins and Evans' program for studies in experience and expertise moves away from arguments over knowledge to explorations of expertise, and their metaphor of working "upstream" of science suggests a new role for the humanities and social sciences in the work of science. Social studies of science have often traced the "downstream" consequences and uses as scientific knowledge circulates in courts, in policy, and in social life. Collins and Evans suggest that science studies scholars collaborate with scientists in designing and prosecuting research projects so that they participate in the research process before it comes to fruition. Like Latour's critic, scholars working upstream of completed projects and published results can help articulate the insights and methodologies of the humanities and social sciences into scientific research projects. Certainly Latour and Collins and Evans are not without their critics, but like Thomas Kuhn in the sixties, they articulate a growing dissatisfaction with the dominant understanding of science, the cultural dominance of scientism, and the endgame of the science wars of the late twentieth century.

Randy Harris has argued that rhetoric of science emerged as a response to Kuhn (Harris, 1997). Harris acknowledged that this is somewhat reductive, but it does capture the way Kuhn's work organized and motivated early work in rhetoric of science. I think it is equally reductive to claim that Latour and Collins and Evans have inaugurated the new move to an engaged RSTEM, but I think that claim also captures the disciplinary impact of their theories and organizing metaphors. For scholars in RSTEM specifically, these essays crystalize an exigency for engagement that had been growing in rhetoric for at least a decade. Disciplines change in response to internal intellectual development, but also in response to contextual exigencies like our impending ecocide, the shift in institutional priorities at universities, and the emergence of new metaphors such as "matters of concern," "things," and "working upstream."

Latour's opposition to modernity and the hegemony of critique and Collins and Evans' move beyond the technocratic understanding of expertise and toward a normative model of democratic engagement are not unique sentiments. Both moves reflect a wider concern about the stalemated opposition in philosophy of science between objectivist and relativist positions

and the analogous agonism between traditionalists in science and many critics in the humanities in the late twentieth century. This stalemate inspires Latour's redefinition of the critic as someone who composes a common world, Collins and Evans' formulation of a third wave beyond the critical second wave, and Barad's impatience with critique. In *Beyond Objectivism and Relativism*, Richard Bernstein argued that we were caught in the opposition between the two extremes in his title and unable to escape that framing:

> There is still an underlying belief that in the final analysis the only viable alternatives open to us are either some form of objectivism, foundationalism, ultimate grounding of knowledge, science, philosophy and language or that we are ineluctably led to relativism, skepticism, historicism, and nihilism (Bernstein, 1983, 2-3).

Bernstein described the either/or logic of this situation as a disabling "Cartesian anxiety," and Barbara Hernstein Smith traced the bitter rhetorical dynamics through which this anxiety plays out in intellectual debate (Bernstein, 1983; Smith, 1997). Bernstein illustrated this situation by describing the infamous clash between Karl Popper's defense of objective knowledge in science and Paul Feyerabend's radical critique of method. What seems most relevant about Bernstein's argument for our current situation, however, is his response. Rather than wade into the dispute as a partisan, Bernstein argued that the two opposing positions share practical-moral concerns that are more significant than "the technical and professional issues that divide them" (Bernstein, 1983, 5). I take Bernstein's work as an overview not only of the divisions within philosophy of science in the late 20th century, but at a larger scale between science and much of the humanities. Bernstein's point, however, was that the shared practical-moral concerns force him to find a way forward that avoids this standoff within philosophy and the bitter politics between science and its critics. It is a similar recognition that science and rhetoric have many shared practical, political, and moral concerns that drive much of the commitment to a rhetoric of science that engages with the work of science. As Condit has argued, science, social science, and the humanities need each other in order to achieve the kind of engaged work that benefits society and humanity in the face of the politically regressive power of what she calls the "warlord caste" of self-interested corporate power (Condit, 2013, 4). For Bernstein, the intersection of hermeneutics, science, and *praxis* offered a productive alternative. For RSTEM, interdisciplinary collaboration

motivated by something like Latour's non-modernism, Collins and Evans' theory of expertise and democratic engagement, or Haraway's refraction offers a possible alternative beyond pure critique and disciplinary boundary work. Rather than continue to act out the dilemmas of modernism and postmodernism, scholars in an engaged RSTEM are searching for ways to work through and past these dead ends because we share many political, ethical, and practical goals with our colleagues in the sciences.

While others might frame the move to interdisciplinary engagement with science differently and invoke other representative theoretical moments than I have, it seems clear that the sentiment for a more engaged RSTEM is real. The 2013 special issue of *Poroi* (9.1), edited by Lisa Këranen, presented a broad dialogue about the state of RSTEM and its future directions. Within that wider dialogue, a group of scholars argued for a more engaged RSTEM. Leah Ceccarelli observed that most of our scholarship is passive, working toward understanding and insight, and is addressed largely to our own tightly knit community (Ceccarelli, 2013). She urged us to find ways to speak more directly to scientists and publics where our work might matter differently. Condit rephrased her argument from an earlier piece with John Lynch in which she lamented the dominance of critique in RSTEM scholarship and called for a more collaborative and constructive engagement (Condit *et al.*, 2012; Condit, 2013). I presented an argument for a non-modern form of praxiography and a program for engaged research (Herndl, 2013). In a follow-up piece, Caroline Druschke argued that we should think beyond a transactional model of RSTEM (where science and rhetoric exchange benefits) and towards deep communication that refigures rhetoric as a central part of the practice of science and rhetoricians as active participants in shaping science and policy (Druschke, 2014).

The essays in this symposium continue the dialogue from 2013 and put at least three questions to us as an emerging sub-discipline. These questions include intellectual and theoretical issues, institutional practicalities, and personal commitments.

Why Would We Do This?

As the essays in the symposium argue, the coproduction of knowledge that can emerge from interdisciplinary engagement often makes more robust theory. In the post-critical era where many RSTEM researchers work "upstream" of scientific research, our understanding and analysis of science and its rhetorical and

political dynamics has become more detailed and sophisticated. Furthermore, the experience of working as part of interdisciplinary projects in a mission-oriented public space can, as Druschke suggested, alter our understanding of rhetoric itself (Druschke, 2014).

Engaged RSTEM also builds stronger intellectual, institutional, and cultural networks for RSTEM, not simply in order to respond to the attacks on theory and hermeneutics, but to position RSTEM more visibly and open up opportunities. At many research universities such as my own, humanities programs that collaborate with STEM departments and participate in funded research will predictably be seen by deans as cooperating in important college efforts. More traditional colleagues sometimes see this as a crass and cynical move, but for many of us it is a strategy to take advantage of a kairotic moment when rhetoric can pursue its traditional concerns for the common good, for practical action, for deliberation, for democracy, and for argumentation. Pursued thoughtfully, this is a felicitous opportunity for committed rhetorical practice.

The kinds of engaged practice discussed in these essays help RSTEM scholars secure outside research grants not just under something like the National Science Foundation's (NSF) "science of science" rubric or the "broader impacts" category on NSF or National Institutes of Health (NIH) grant applications. Increasingly RSTEM scholars are able to help design and execute projects in applied science, sustainability, and medical research as full partners rather than as consultants who provide secondary services, often restricted to "communications" in the shape of instrumentalist public relations.

Finally, many of us care deeply as citizens and community members about the kinds of problems engaged or mission-oriented RSTEM pursues. This is a version of the shared moral political concern to which Bernstein alludes. If Condit showed us the gap between the sciences and the humanities, I suggest that there is often also a gap between our work as scholars and our lives as citizens and members of emergent publics (Condit, 2013). The interdisciplinary work of engaged RSTEM can help connect all those parts of ourselves that are too often segmented in the academy.

What Difference Will It Make?

Besides the many intellectual and institutional benefits to our discipline, these essays suggest that engaged RSTEM has a lot to offer to interdisciplinary projects, to communities, and to students. If collaboration with scientists makes our thinking different, more robust, and challenges our easy assumptions, it does the same for other disciplines and project teams. Humanities scholars often expand or complicate the definition of a research problem and the goals of a project. For scientists, it is easy to see a problem as a technical issue with a technical solution. Humanities faculty bring a tradition of and critical apparatus for thinking about human and social aspects of problems that science often lacks or overlooks. Scholars in engaged RSTEM can help augment the analytic *what* question in science projects with ethical questions about *why* and democratic or deliberative questions about *how* that are often absent from these conversations.

Practitioners in engaged RSTEM can also change the process through which disciplines interact with each other and with communities (Wilson and Herndl, 2007; Graham *et al.,* 2016). As Bridie McGreavy, Karen Hutchins, Holly Smith, Laura Lindenfeld and Linda Silka have argued elsewhere, designing communication strategies among researchers and between research teams and communities can facilitate just the sort of productive boundary work that helps members of large interdisciplinary teams escape their own disciplinary silos (McGreavy *et al.*, 2013). Developing strategies and digital spaces for cross-boundary communication is something engaged RSTEM scholars can do and that can be justified on grant proposals.

How and Where Do We Fit In?

This seems to me the most difficult disciplinary and institutional question these essays present. It involves the relationship between rhetorical theory and engaged practice, between individual scholars and their departmental and institutional credit cycles, and, of course, between RSTEM scholars as members of institutionally weak disciplines and our colleagues in more institutionally powerful STEM disciplines. These are vexed questions which have no final answers and whose forms are often quite local.

As we have argued, theory and criticism have dominated RSTEM scholarship up to this point. That is only natural. It is the privileged work of a discipline and what most of us were trained to

do. As Walker points out here, that is the work that brought us to the table and helped make space for engaged RSTEM work.

I suggest that the relationship between rhetorical theory, criticism and engaged practice presents at least two difficult challenges. I describe the first as the challenge of working *with* science rather than *for* science. The question here is the same as John Ackerman and David Coogan pose to rhetoric engaged in social change: "Towards whose ends would rhetoric work?" (Ackerman and Coogan, 2010, 6). My own experience working on interdisciplinary research teams in science is that it is very easy for the rhetorician to "go native" when he or she is the only rhetorician or humanities scholar on a project. It is easy to adopt the intellectual, ideological, and institutional position that typically dominates a scientific research project. Lynda Walsh phrases this problem as the question, "How do we achieve greater disciplinary rigor without losing our civic edge, and how do we make ourselves a public resource without becoming a tool of hegemony?" (Walsh, 2013, 2). We want to participate in mission-oriented science projects that often induce us to embrace the ethos and framing of science, but this often makes it difficult to maintain some critical and analytic difference and distance. That difference is, however, much of what makes us useful.

In framing the emergence of engaged RSTEM, I have identified the widespread frustration with critique as a common motive. But that frustration should not mean we abandon the lessons of feminist critique and cultural and rhetorical analysis of science. In his response to Collins and Evans' "Third Wave" essay, Brian Wynne underscores the ease with which we can come to work *for* rather than *with* science (Wynne, 2002). He argued that Collins and Evans' concept of the experience-based expertise held by non-credentialed experts merely reinforces and extends what Wynne called a "propositional hegemony" that privileges knowledge claims that are continuous with science and marginalizes other forms of reasoning and authority. This propositional hegemony "neglect[s] issues of public meaning, and the presumptive imposition of such meanings (and identities) on those publics and the public domain" (Wynne, 2002, 402). That is, the expertise of non-credentialed experts is defined as an alternate form of scientific knowledge, leaving the question of the meaning and purpose of science unexamined. Wynne's argument is that Collins and Evans unwittingly truncate the social politics and democratic ethics of engaged work.

The second challenge in the relation of theory to practice is the issue of tool use. We need to turn the insights of rhetorical theory

into strategies and tools for doing engaged work. Those strategies and tools need to be recognizable not only by our colleagues in the sciences, but by evaluators in grant funding agencies. Hermeneutics and criticism are intellectually useful, but they are a hard sell on NSF and NIH proposals. The tension I see is between our commitment to sophisticated concepts and rhetorical practices that avoid reductive simplification and the demand for simple tools and utilitarian practice of the sort that too often troubles science communication when it is seen as merely an efficient conveyer of scientific truth or as a response to the deficit model of public understanding of science. In trying to define the rhetoric of medicine, Judy Segal took up precisely this tension when she distinguished between "applied" and "useful" scholarship (Segal, 2005). For Segal, applied work was merely instrumental. Formulating safe sex messages so that they are more persuasive to the public is applied rhetoric. Useful scholarship by contrast entails coming to understand a phenomenon or question and its rhetorical effects. Understanding the cultural notion of safe sex and its discursive force is useful research. Segal's conclusion was that "applied research is at the same time useful; but useful research is not necessarily applied" (Segal, 2005, 4). Everyone I know who works in this interdisciplinary space encounters this tension. This is a practical version of the tension between theory and practice driven by the cutthroat economics of most research grant guidelines and a Principal Investigator's need to justify the allocation of funds and promise specific (and specific types of) deliverables.

The second question of fit is institutional. While Ceccarelli worries that we publish almost exclusively in disciplinary journals and urges us to speak to the science community and to relevant publics, she acknowledges that there is little institutional recognition or reward for doing so. John McGowan articulates a commonplace of the literature on engaged scholarship when he observes that, "Engaged work will, very likely, come in forms that are not peer-reviewed, are often digital, sometimes ephemeral, and at other times emphasize process over product" (McGowan, 2010, 416). As he and others comment, this work is typically not recognized or rewarded. More than once as an outside reviewer for tenure and promotion I have received a list of primary and secondary disciplinary journals that I should use in evaluating a scholars' work. I never see mention of extra-disciplinary publication venues. What happens to the articles I have published in *The Journal of Soil and Water Conservation*? Worse yet, what happens to technical reports or to productive work in communities

that does not culminate in a peer reviewed publication? The risks are real, especially for untenured faculty. This situation has long plagued action-oriented programs like some Women's and Gender Studies programs or community engagement programs in Sociology. One strategy for managing this risk is to turn that action-oriented research into peer reviewed publication as Blythe, Grabill, and Riley did with their work with community members in the community they called Harbor as they struggled with the proposal to dredge the canal that runs through their community (Blythe *et al.*, 2008). This strategy is less than ideal, however. It requires the engaged RSTEM scholar to do double duty and pursue two publication agendas instead of only one.

I close with three other concerns. The essays in the symposium talk about "engaged" RSTEM. In earlier essays, I have referred to "applied" RSTEM. Neither term is unproblematic. Calling this kind of work "applied" RSTEM risks our being seen as instrumentalist and non- or even anti-theoretical. It can suggest a belief in the technological control of nature and society or that such work is merely a means to a predetermined end. Applied RSTEM must not acquiesce to the modernist dream of an administered society, driven by technocratic management that is fundamentally undemocratic. Perhaps "post-critical" or "engaged" rhetoric of science might be better terms, the first anchored in a theoretical movement, the second capturing the collaborative element of interdisciplinary or community-based work. I suspect that "engaged" is a safer and more encompassing term and less vulnerable to the hostile interpretations that "applied" and even "post-critical" might invite. Whatever the term, we need to heed the argument that Miller's made that technical writing can be "practical" in the sense of *phronesis*, and we need to build an engaged RSTEM that aims toward practical wisdom and the common good (Miller, 1989).

I worry, however, that we too readily warrant our work with the notion of engagement without thinking carefully about what that means. Many RSTEM scholars argue for engagement that exceeds the classroom, but this can overlook the long tradition of service learning as engagement with science and medicine. Other contributors talk about engagement with interdisciplinary research projects in science across a wide range of topics and purposes. Still others see engagement as participating in a conversation with nonacademic audiences and publics, as Steven Mailloux does (Mailloux, 2006). Engagement is an intuitive notion and operates like a "god term" in much of our discourse including my own. But it is also protean and shifts its style, political positioning, and purpose

as the site of activity alters. I don't think this is a serious problem, and I don't advocate for a single or normative model of engaged RSTEM. We need to survey the sites, types, and styles of work that engaged RSTEM does that can provide us exemplars and inventive possibilities going forward.

Finally, and most importantly, I hope that we can articulate a professional and civic purpose for this engaged work that is cosmopolitan enough to support the range of scholarship and practice that is already emerging yet is substantive enough to champion a progressive intellectual and political project. In their call for an activist STS, Woodhouse and colleagues articulated their goal nicely: "Reconstructivism probably should be defined not by any particular agenda, but by the more general intention of conducting forefront scholarship aimed in part at helping to inform and deepen public inquiries, deliberations and negotiations concerning the democratic shaping and reshaping of technologies" (Woodhouse *et al.*, 2002, 299). There is much wisdom in this formulation. Perhaps we might think of engaged RSTEM as participating in the development of science and technology that strengthens and protects the human and non-human community, that fosters inclusion in technology and policy deliberation, and that produces a more humane and, in Haraway's terms, a more livable world. Such a project must not be seen as in opposition to or exclusive of more traditional or curiosity driven research. Engaged practice and scholarship and more academic, theoretical, or historical scholarship are disciplinary traveling companions. As a discipline and as citizens, we will all be best served if ideas, values, and practices move constructively across the shifting emphases and positions within our field.

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