

Rhetorical Criticism and the Rhetoric of Science

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Skeptics have argued that scientific texts are resistant to scrutiny by rhetorical critics because of the recalcitrance of nature, the exegetical equality of scientific communication, and the institutionally driven nature of scientific text production. This paper argues that none of these purported differences between scientific and public texts bars a rhetorical reading. But each point of contention raises a larger issue about the relationship between text and context in the broader field of rhetorical inquiry: the relationship between text and subject matter, text and audience, and text and author. This paper also addresses the concern that a rhetorical study of scientific texts (or other non-traditional artifacts) dangerously globalizes rhetorical theory.

IN 1976, Philip Wander published an article in *WJC* with the title “The Rhetoric of Science.” Pointing out that “the rhetorical critic has been slow to treat this topic” because of “the mystique of modern science” and “the historical split between science and the humanities,” Wander noted that scholarship on the rhetoric of science was just beginning to appear in our disciplinary journals (226). He then sketched the outlines of this newly emerging subfield of rhetorical inquiry. According to Wander, there were two ways in which science would be amenable to rhetorical investigation. First, the place of science in public policy deliberation “obliges the critic to concern him or herself with science: how it is used in debate; how it relates to other sources of information; what occurs when there is conflicting scientific evidence” facing decision makers in the public sphere (226–27). Second, the “efforts made by scientists to persuade one another,” such as “grant proposals, journal articles, and convention papers [that] are designed to influence a professional audience,” open science to the scrutiny of rhetorical critics (227).

In the years that followed Wander’s article, work in both the external and internal rhetoric of science grew; however, the second grew faster than the first, and the professional discourse of scientists soon became entrenched as the “prototypical” form of text studied in the

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subfield (Harris 294–96). It is likely that rhetorical critics who were interested in science turned their attention to the discursive practices that go on *inside* scientific communities because they considered artifacts from the inner sanctum to be the “hard case” for a rhetoric of science, which, once made, would open the external texts of science to rhetorical study as well.

They had good reason to think that their task would not be easy. Some scholars have argued that the discourse of science differs significantly from the discourse of the public sphere that the rhetorician is accustomed to studying, and because of this, rhetorical criticism is bound to fail when it is turned on textual artifacts produced in the specialized technical sphere of science. The three characteristics of scientific discourse that are most often isolated in describing its resistance to rhetorical scrutiny are the “recalcitrance of nature” that guides scientific textual inscriptions, the “exegetical equality” of scientific discursive practices, and the “institutionally driven” nature of scientific text production processes.

A close look at work that has been done in the “rhetoric of science” subfield will show that each of these three alleged differences between scientific discourse and public discourse is illusory. However, rhetorical critics should not dismiss these matters out of hand, for when scrutinized further, it turns out that each of them stands in for a more serious issue about the relationship between text and context in the broader field of rhetorical criticism. In this paper, I will examine each topic as it relates to the rhetoric of science. I will then explore the larger implications that spin from each topic when considered from the perspective of the broader field of rhetorical criticism. With these implications in mind, I will offer a recommendation in each case for how rhetorical critics might further develop their critical practice.

Before closing, I will examine a final concern that has been raised about work on the rhetoric of science—that scholarship in the subfield dangerously globalizes rhetorical theory. Those who express this concern accept the claim that rhetorical criticism *can* be applied to scientific discourse, but they are not sure that such a study *should* be undertaken by scholars of rhetorical inquiry. As with the other objections against a rhetorical study of science, I will not leave this as a matter for the sole consideration of specialists in the subfield; instead, I will explore the implications of this critique for rhetorical critics of all stripes. In both cases—with respect to the possibility and the desirability of a rhetorical study of scientific texts—I will engage in an exploration of research that has been done and an investigation into what might yet be done in order to address some larger issues that are of general interest to scholars in the field of rhetorical inquiry.

The Recalcitrance of Nature

The difference most often noted between scientific texts and public discourse is the closer connection that seems to exist between scientific texts and material reality. According to some scholars, the “recalcitrance of nature” will always keep rhetoricians from creating an adequate rhetorical reading of scientific texts. For example, Michael Bokeno points out that the rhetorician’s claim that knowledge is socially constructed does nothing to account for the explanatory and predictive success of science (297). J. E. McGuire and Trevor Melia concur, arguing that “Science is the result not only of textual representation, but also of extra-textual interventions with nature. That is, scientific texts, unlike other texts, are not only the product of libraries, but also and notably of laboratories” (94).

The nature of the relationship between a text and its subject matter is the issue here. Are scientific texts *mere* rhetoric, constructing knowledge from socially inflected discursive practices, or are scientific texts a reflection of some deeper reality over which rhetoric can make no claim? The philosophical debate has ranged for many years, with no end in sight; in fact, each side has stopped trying to persuade the other, proclaiming that the issue has been settled in its favor.¹

But despite the entrenched positions of opponents in the so-called “science wars,” the question is ultimately a false dilemma for the working rhetorical critic. When engaged in critical practice, rhetorical scholars are neither radical relativists nor strident realists; instead, they must always strike a middle ground position between these two extremes. Texts from either the technical or public sphere, *when scrutinized through the lens of rhetorical inquiry*, are neither reducible to “mere” words nor understood as straightforward reflections of some deeper reality; instead, the scholarly practice of rhetorical criticism always treats texts as a convergence of discursive opportunities and material constraints.

This is just as true for public texts submitted to rhetorical analysis as it is for scientific texts. Despite the contention of McGuire and Melia, texts that are traditionally studied by rhetorical critics, like political speeches, are not “only the product of libraries.” Rhetorical critics recognize that discourse in the public sphere is always shaped by a combination of situational constraints. Without assuming the ontological reality of such “recalcitrances” as political situation, biographical circumstance, and socio-historical setting, rhetorical critics of public address use these “facts” as constraints to shape their readings of public texts.

Likewise, without assuming the ontological reality of laboratory or field observations, rhetorical critics of scientific texts use certain “facts” as constraints to shape their readings. For example, consider Alan Gross, who once countered McGuire and Melia’s “Cautionary

Strictures on the Writing of the Rhetoric of Science” with the call for a “Rhetoric of Science Without Constraints.” Although Gross supports a radical relativist position in his theoretical writings, when performing rhetorical criticism of scientific texts, he assumes the “existence” of laboratory findings that limit the arguments offered by scientists. In a reading of Watson and Crick’s “A Structure for Deoxy Ribose Nucleic Acid,” Gross acknowledges that a two-dimensional X-ray diffraction photograph and “previously isolated chemical facts” constrained the scientists’ textual model building (*The Rhetoric of Science* 63–64). In a reading of Newton’s first paper on optics, Gross acknowledges that “the crucial experiment clearly and unequivocally shows” that white light can be separated into rays that make up the colors of the spectrum (*The Rhetoric of Science* 119–20). When performing a rhetorical reading of a text, even a rhetorician who leans toward a radical relativist position is forced to suspend his disbelief.²

It is not some special characteristic of the scientific text that forces Gross to recognize material constraints in his rhetorical analysis. Rather, it is a special characteristic of *rhetorical inquiry*, which, recognizing the interconnection of words and things, is designed to be sensitive to the recalcitrances of nature, just as it is designed to be sensitive to the possibilities of language. In short, the concern of some that the rhetorician might do a disservice to science by failing to recognize the constraints of extra-textual entities in the construction of scientific knowledge claims is unwarranted. Texts in both the public and technical spheres are constructed from the interaction of words and things, and rhetorical criticism, with its attention to both discursive possibilities and situational constraints, is well prepared to examine this relationship.

This issue of how texts relate to their subject matter is important to all rhetorical critics, not just to those examining scientific texts, because we must all contend with the complex relationship between the textual and the extra-textual. I believe that if we were to do more to explicitly recognize the way in which linguistic and material factors cooperate to shape a rhetorical reading, we might help our discipline improve its position in the larger public and academic communities. Every day in the popular press and in the scholarship of those who are unfamiliar with the rhetorical tradition, the term “rhetoric” is used in a pejorative sense, set in opposition to the terms “substance” or “action.” If we rhetoricians did more to publicize rhetorical criticism as a study of the *connection* between words and substance (or between words and action), rather than celebrating rhetorical criticism as a study of the *all-powerful* words that fabricate reality, or allowing rhetorical criticism to be dismissed as the study of *mere* words divorced from reality, we might find ourselves in a better position with respect to the larger community in which we work.³ When people outside our discipline come to recognize that rhetorical criticism is concerned not

just with the deceptive nature of words but with the complex relationship between the discursive and the non-discursive, they will have less reason to dismiss the rhetorical study as distasteful or insignificant. Rather than describing our critical practice as “rhetorical” without explaining what we mean by that, or dropping the term “rhetoric” to avoid the negative connotations that come along with it, we can rehabilitate the public image of rhetorical criticism in a way that will make both scientists and public actors more receptive to our critical readings of their texts.

Exegetical Equality

The second characteristic of scientific texts that allegedly makes them different from public texts is their remarkable ability to communicate clearly to their target audience. According to McGuire and Melia, many of the specialized textual norms of the scientific community work together to create a message that cannot be misread, embodying “in its very structure the possibility that *all* expert members of the scientific community are equal to it exegetically” (96). The standardized form of scientific writing purportedly creates a text that requires no special interpretive powers to decode its message; all scientists read that text in the same way. According to Gyorgy Markus, this superior communicative quality makes scientific texts different from public texts, and explains why there is no need for a hermeneutics of natural sciences (9–10). As Paul Ricoeur puts it, scientific language seeks not only to reduce polysemy, but to eradicate it: “All readers are, in a sense, one and the same mind, and the purpose of [scientific] discourse is not to build a bridge between two spheres of experience, but to insure the identity of meaning from the beginning to the end of an argument” (127–29).

The nature of the relationship between a text and its audience is the issue here. Are scientific texts transparent to their audiences? If so, can rhetorical critics, who are trained to interpret public texts that are embedded with complex meanings, say anything of interest about these terminologically sophisticated but exegetically shallow texts produced by science? If the nature of the relationship between scientific texts and their audiences is radically different from the nature of the relationship between public texts and their audiences, then rhetorical critics may be ill equipped to study scientific texts.

Once again, a look at some work that has been done in the “rhetoric of science” subfield can help us to answer these questions. Several close readings of scientific texts have indicated that despite assumptions to the contrary, multiple meanings *are* embedded in scientific discourse; in fact, the hidden polysemy of scientific texts may actually contribute to their effectiveness. For example, my rhetorical analysis of Theodosius Dobzhansky’s *Genetics and the Origin of Species* and Erwin Schrödinger’s *What is Life?* indicates that the very *lack* of exegetical equality

is what allows some scientific texts to be so persuasive with scientific audiences (*Shaping Science*). John Angus Campbell's work on Darwin's *Origin of Species* also "challenges the received notion that clarity or univocacy is the norm or goal of scientific language" ("On the Way to the Origin" 22; see also "The Polemical Mr. Darwin" 384–85). And Michael Bishop's recent study of Newton's *Optics* discovers "semantic flexibility," rather than rigid precision of meaning, forcing Bishop to conclude that "scientific expressions (like many others) are often supple and open-ended. The possibility of expressing a partially indeterminate concept is an important (and neglected) element of scientific practice" (225).

So once again, an alleged difference between scientific texts and public texts is found to be more a product of "the mystique of science" and "the historical split between science and the humanities" than an actual phenomenon of the texts under study. Scientific texts, like public texts, are hermeneutically complex. That is not to say that there is *no* difference between the way that scientists interact with texts and the way that public audiences interact with texts. Some of the most vocal supporters of the rhetoric of science project have admitted that the reading practices of scientists differ from the reading practices of public audience (Fuller 309–10; Gross, *The Rhetoric of Science*, reprint ed., xvii). But, as Davida Charney has shown through her experimental study of scientific readers, the differences are ones that do nothing to diminish a rhetorical criticism. Charney has shown that scientists read their discourse "rhetorically . . . In other words, they read their literature the way scholars in the humanities might read *PMLA*" (228). While graduate students in the sciences often try "to do no more than comprehend the text and integrate it with their prior knowledge," professionally advanced scientific readers are "prone to treat the text rhetorically, as probabilistic argument about facts and values" (228). The reading practices of scientists are therefore perfectly intelligible to the rhetorical critic, perhaps more so than the reading practices of public audiences, whose actual relationship with texts the rhetorical critic has done little to reveal.

The larger issue in rhetorical criticism raised by this mediation on the relationship between a scientific text and its audience regards the question of how audiences interpret the texts they encounter. For many years, the rhetorical critic has been satisfied with asking how audiences were *invited* to respond to texts. But discovering how an ideal reader was constructed in the text only tells us how an implied author envisioned his or her audience, not how audiences actually interpreted the text. This focus on the ideal reader becomes especially problematic when one considers the fact that an interpretation of the audiences present but not addressed, or addressed but not persuaded, might provide a more useful understanding of the power dynamics at play in important historical moments (Condit 335). If we are interested

in the way that a text achieves or does not achieve its end of persuasion, or if we are interested in how a discourse participates in the development of cultural truths, we need to pay more attention than we presently do to the relationship between texts and their audiences.

Elsewhere, I have introduced a revised critical method that connects texts with their receptional context by producing a close reading not only of the primary artifact, but of the textual fragments that preserve evidence of audience response (“Polysemy” 400–02, 404–07). My claim, which is not as radical as it may seem, is that rhetoricians should do more to uncover the ways that actual audiences interpret texts. I am not arguing that rhetorical critics should adopt a social scientific methodology to study audiences; instead, I am suggesting that we apply the critical practices we have already perfected on primary texts to the inscribed responses of readers who encountered those texts.⁴ In many cases, evidence about reception exists, but is not examined by rhetorical critics who restrict their attention to the artifact itself and to its broader historical context.⁵ By paying more attention to the relationship between text and audience, we can do more to substantiate our claims about the influence of rhetorical action, and can thereby increase the usefulness of our critical practice.

Institutionally Driven

The third characteristic of scientific texts that purportedly makes them unfriendly to rhetorical criticism is the institutional nature of their production. According to Dilip Gaonkar, rhetorical criticism is tied by its classical roots to the “ideology of human agency,” and because of this, it is particularly “disadvantaged in doing interpretive work with institutionally driven discursive formations such as modern science” (“Close Readings” 343). Presumably, the scientific text is different from the archetypal model of public address in that the former is not composed by an intentional agent seeking to influence others, but is instead produced by a “matrix of technologies . . . that elude the reach and the imprint of the subject” (“Close Readings” 337). Says Gaonkar, “the vexatious fact remains that rhetoric, conceived primarily as a transaction by and between discrete individuals, cannot unlock the grammar of massive social formations such as ‘modern science’ that are propelled by ‘system imperatives’” (“Close Readings” 337–38).

The nature of the relationship between a text and its author is the issue here. Are scientific texts constituted through institutional imperatives rather than crafted by individual agents? If so, then perhaps rhetorical criticism, which typically “binds speaker, strategy, discourse, and audience in a web of purposive actions,” is inadequate to explain the production of scientific discourse (Gaonkar, “Idea” 263).⁶

Some scholars of the rhetoric of science respond to this question by contesting Gaonkar’s portrayal of scientific discourse. They argue that

scientific texts, like public texts, are the result of *both* authorial cunning and institutionalized discursive patterns, and they suggest that any assumption to the contrary is evidence once again of “the mystique of modern science” being used to falsely differentiate the humanities from the sciences. Gaonkar’s vision of a scientific discourse that is produced solely through the synergy of systemic forces is too limited. As John Angus Campbell puts it, all speakers can be described accurately as “the point of origin” or “the point of articulation” or “as a tensional fusion of both” (“Strategic Reading” 123). Campbell’s work on Darwin’s *Origin* indicates that the production of at least one important scientific text was both inadvertent and intentional, both influenced by its position in a cultural matrix and a unique innovation by a talented rhetor upon what had come before (“On the Way” 22). Alan Gross makes a similar point with his study of modern peer review in science; he shows that today’s scientific writers are indeed human agents responsible for their actions (“What If” 145).⁷ His rhetorical study, tied tightly to the “ideology of human agency,” disputes sociological studies of science that focus exclusively on the “limitations of individual wills and the degree to which those wills are constituted by cultural imperatives” (“What If” 145). According to both Campbell and Gross, a rhetorical criticism infused with the ideology of human agency allows us to recognize the importance of *both* scientific rhetor and scientific institution in the production of scientific discourse. In fact, it is especially important that rhetorical criticism be added to the already growing sociological study of science, because otherwise, scholars may fail to recognize how scientific texts are made up of *both* the carefully crafted rhetorical strategy and the articulatory practices of a cultural conjuncture.

The larger issue raised in the field of rhetorical criticism by this question about the relationship between scientific rhetor and text concerns the degree to which a rhetorical critic should be expected to trace the variety of influences that work to shape textual production. If a rhetorical critic focuses exclusively on the text itself, and assumes that what is found there is the infallible sign of a consciously deliberating agent with “a tangible power to influence and refigure the ideological terrain” from which s/he originated, the critical project is misguided (Gaonkar, “Epilogue” 273). On the other hand, if a rhetorical critic focuses exclusively on the intertextual matrix from which a text emerged, and assumes that what is found there is the infallible sign that human agency is powerless before the institutional forces that impel discourse along certain fixed paths, the critical project is also distorted. Once again, it seems that a balanced negotiation between text and context is required if we are to make the most of our critical practice.

James Jasinski is thinking of this issue when he recommends that we improve the practice of rhetorical criticism by reading the text

within and against its intertextual background, charting the relationship between text and “performative traditions” (212). The rhetorical critic following this recommendation assumes that text production is not simply the inspiration of a genius rhetor, nor is it a process of following rules or precepts that dictate discursive practice; instead, it is an orchestration of both invention and tradition (214–16). Because Jasinski’s recommendation to negotiate between contextual constraint and textual strategy merges the cultural critic’s desire to uncover the hidden institutional constraints on discursive action with the textual critic’s desire to uncover the hidden genius in the persuasive design of the text, it becomes a promising way of achieving an equilibrium between two competing interests in the larger discipline. It is an improvement to critical practice that I wholeheartedly support.

Globalization

The recalcitrance of nature, the alleged exegetical equality of scientific texts, and the institutionally guided nature of scientific text production are all weaker barriers to a rhetorical study of scientific texts than some have assumed. Perhaps because of this, most have accepted the claim that rhetorical criticism *can* be applied to the discourse of science. But some are still unsure about whether or not it *should* be. These scholars are concerned that because the discipline has expanded the range of its critical scrutiny, turning away from its traditional restrained subject matter of discourse in the public sphere, it is changing to fit its new expanded role, and in so doing, is losing its theoretical bite.

Those who express this apprehension about the rhetorical study of science are concerned that in trying to explain too much, rhetoricians are being forced to globalize rhetorical theory, making it fatally thin. In order to accommodate the “rhetoric of science,” the field of rhetorical inquiry is being forced to adopt a sterile theoretical perspective that can be used to describe all discourse but is no longer specific enough to say anything of interest about any particular discourse. As Thomas Farrell warns, with the expansion of rhetoric’s range, we will have “so much to study, so little to say” (82). According to this view, the more rhetoric is generalized to explain many different genres, the less susceptible it will be to falsification and the less capable it will be of maintaining its role as a vital, non-trivial academic enterprise.⁸

This concern is a very real one for those who adopt a view of theory as a unified conceptual scheme that is progressively built by academic workers; from this perspective, the expansion of rhetoric outside its traditional domain of public discourse can only work to shorten the list of generalizable characteristics. To find the presence of rhetoric in all discourse genres, the theoretical vocabulary will have to be made so “thin” that it will lose any disciplinary force (Gaonkar, “Idea” 263). Rhetoricians will be forced to analyze symbolic action that cuts across

all levels of human activity, and the only theory that can be produced will be a sort of general symbolic grammar. Those concerned about the consequences of globalization say that rhetoricians might have produced a useful theory of the speech that occurs in the restricted space of the public sphere, but a rhetorical theory that encompasses *all* communication will have to be so general as to be useless for most practical purposes.

Once again, a look at the literature of the subfield shows that the worst fears of critics are not realized in practice. For example, Jeanne Fahnestock shows that rhetorical theories developed in one sphere of activity can be just as useful in explaining discourse in another. She identifies several traditional figures of speech (antithesis, incrementum, gradatio, antimetabole, ploche, and polyptoton) in the discourse of science, and does not distort the classical rhetorical theory of figuration to do so. In fact, Fahnestock finds that she is better able to exemplify the way in which the figures function by turning to scientific arguments, which give their "main lines of reasoning a high profile," than by relying solely on the oral public discourse for which the theories were first developed (xi). Likewise, rhetorical theories productively inform several studies of Watson and Crick's "A Structure for Deoxy Ribose Nucleic Acid." Rhetorical critics explain the design of this text through theories pertaining to voice, ethos, irony, kairos, stasis, and narrative (see Bazerman 18–55; Halloran; Gross, *The Rhetoric of Science* 54–65; Miller; Prelli 236–57; Fisher). While they do not all agree about how this prototypical scientific text should be interpreted and judged, they all find intriguing things to say about its production and its influence without diluting the rhetorical theory through which they view it.

Of course, rhetoricians of science are not the only contemporary rhetorical scholars to enlarge the scope of the art. The range of artifacts considered by critics has expanded enormously from the traditional terrain covered by the discipline; today, rhetorical critics are just as likely to study television programs, monuments, and web sites as they are to examine public speeches.⁹ Like rhetorical critics of scientific texts, these rhetoricians have found the terminology and perspectives of the rhetorical tradition useful in interpreting, explaining, and judging the artifacts they study, and they have had little difficulty adapting rhetorical theories to these new uses.

However, the fact that rhetorical theory has not yet been rendered so diffuse as to be useless does not guarantee that it will remain a vital art in the future. In my opinion, there are two things that rhetorical critics can do ensure that our field is not trivialized now that we have expanded our sights to include the study of nontraditional communication genres: we can recognize our unique ability to explain influence through the identification of important microscopic features of texts, and we can affirm a nonhierarchical conception of theory that allows

for a variety of insights to be linked in web-like fashion rather than force-fitted into a hierarchically arranged globalized system.

First, if we can no longer differentiate our work from that of other disciplines by the domain of human communication we study, we can still differentiate ourselves by the *way* we study communication. I think we should recognize and celebrate the fact that we have a unique perspective to offer the academy: we illuminate intriguing structures of influence beneath the surface of the text (and we do so regardless of where the text originated).

Rhetoricians who recognize the danger to the discipline of a globalized rhetorical theory are fond of quoting the Latin phrase "*Si omnia, nulla*" (Keith et al. 331). But this maxim does not always hold when it comes to the creation of powerful disciplinary identities. Sometimes, the power of a discipline is directly related to the ubiquity of its object of study. An analogy helps to make this point more clear. A molecular biologist would say that the fact that biological molecules are everywhere and everything in organisms, and the fact that molecular biologists can help us understand these molecules, is the very reason the field of molecular biology has become so powerful today. Molecules are omnipresent, but because they are not observable by the naked eye, they must be studied by specialists who are educated in the various ways of revealing their secrets. Likewise, rhetorical structures are present in all forms of text, but they are rarely recognized by the layperson; the rhetorical critic has the specialized training to identify these structures and explain their function.

It is true that some types of biological molecule differ slightly from one species to the next, others are fairly uniform across species, while yet others are unique to one species alone; likewise with the rhetorical patterns that critics discover within different genres of discourse: some are uniform across genres or are closely related to each other, while others are unique to the genre in question. Just as molecular biologists study molecules in different species of animal, so too should rhetorical critics study persuasion in different genres of text. And just as an analysis of the function of biological molecules can tell much about how organisms work, so too can many practical insights be gathered from a recognition of specific rhetorical constructions found in the close study of different textual artifacts. Rhetorical criticism, because it uncovers pervasive and important but subtle and otherwise unrecognized persuasive structures that may differ from one text to the next, avoids becoming trivialized when it expands its field of potential artifacts.

The second approach we can take to counter the danger of globalization is to abandon any lingering scientific attachment to the "strong version" of theory, in which academic workers seek to develop a hierarchically unified conceptual scheme, and instead promote a more pragmatic and humanistic conception of theory. Rather than

trying to construct a generalized theoretical system that explains all discourse in broad but unremarkable vertical strokes, rhetoricians should use their critical faculty to recognize analogic characteristics of texts in a horizontal move from one particular to the next (Leff, "Things Made by Words" 223–31). Rather than apply a global vocabulary to the study of large discursive formations in the hopes of building a single, unified, "one-size-fits-all" theory of persuasion, rhetorical critics should choose which aspects of a fairly loose rhetorical lexicon to use to best illuminate a specific text, and work to build a pool of findings that are united opportunistically in the person of the sensitive and well-read rhetorician. With a perspective toward theory based in the arts and humanities, we can apply rhetorical criticism to a variety of artifacts from both public and technical spheres while avoiding the reduction of our insights to a single globalized, but rather trivial, theoretical structure.

Conclusions

The question of whether or not rhetorical criticism can and should be applied to the scientific text concerns the proper scope of the art. This question can best be answered by examining work that has been done over the last twenty-five years by scholars who have attempted to use rhetorical criticism to reveal interesting things about texts from the inner sanctum of science. These studies show that while there are certainly differences between the scientific text and the public text, those differences are small enough, and the critical practice of rhetorical inquiry is flexible enough, to make rhetorical criticism a useful tool to employ in the study of scientific discourse. Rhetorical criticism is fully competent to scrutinize texts that entangle the possibilities of language with the recalcitrances of nature; it is helpful in uncovering the exegetical complexity that is hidden beneath the surface of the seemingly transparent scientific text; and it does a fine job of revealing the subtle ways in which scientific discourse is both institutionally driven and carefully crafted by human agents. As long as we take a perspective toward theory that is grounded in the arts and humanities, the study of scientific texts will result not in trivially global pronouncements, but in specific developments in our understanding of human communication.

This reflection on the contested status of a "rhetoric of science" should be of interest not only to those who examine texts from the technical sphere, but to all rhetorical critics. First, each purported difference between the scientific text and the public text raises a broader issue about critical practice in the larger field: what is the relationship between texts and their subject matter, or between texts and their audiences, or between texts and their authors? Second, reflection on the desirability of a rhetorical study of scientific texts forces us all to ask some serious questions about our disciplinary

identity and the nature of our contribution to the mission of the academy.

Some of these questions resonate with the central problem engaged in the 1990 *WJC* "Special Issue on Rhetorical Criticism": what is the proper relationship between text and context in the rhetorical critic's art? In this paper, I have argued that today's rhetorical critics should seek to balance between the competing extremes of a too exclusive focus on text or a too expansive a focus on context. We can achieve this balance by focusing on the *connections* between text and subject matter, between text and audience, between text and author, and between text and theory.

For example, rather than perpetuate a formalist study of the internal dimensions of an isolated text, the rhetorical critic can vow to make connections between text and intertext, uncovering fragments of reception that indicate how audiences interpreted the primary text and fragments of production that indicate how authors both reproduced and altered the institutional and cultural resources available to them. At the same time, rather than abandon our discipline's unique ability to grapple with the particular and the consequential, the rhetorical critic can vow never to defer the text in an exclusive focus on context that makes her scholarship into a work of amateur cultural history and leaves little trace of the microscopic reading of texts that so distinguishes our scholarship. A focus on the *connection* between text and context demands a careful examination of a primary text and the intertextual fragments that surround it. It also demands a recognition that the rhetorical is made up of the interpenetration of the discursive and the non-discursive, and the intentional and the involuntary, as these seemingly competing forces come together in a particular, situated, persuasive artifact.

NOTES

¹Examples of the anti-realist position in the rhetoric of science are set forth in Gross, *The Rhetoric of Science*, and in Myers. Examples of the realist position taken by some scientists can be found in Gross and Levitt, and in Sokal and Bricmont.

²When asked to bracket the *philosophical* issue and talk about the *practice* of rhetorical criticism with respect to the realism/anti-realism debate, Alan Gross acknowledges that a scholar must at the very least hold to Arthur Fine's conception of "common sense reality" (which one assumes to exist but which cannot be characterized independently of the observer) when writing a rhetorical analysis. He made this comment at the 1992 National Communication Association Convention presentation of his "Rhetoric of Science Without Constraints" paper.

³The study of the connection between words and matter is a Ciceronian view of rhetoric, the celebration of the all-powerful words that fabricate reality is a sophistic view of rhetoric, and the dismissal of rhetoric as mere words rather than reality is a Platonic view of rhetoric. As rhetorical critics, I think we often unwittingly promote a sophistic or Platonic view of our field when we seek to uncover the "deceptive rhetoric" employed by hegemonic social institutions or particularly loathsome political figures.

⁴This approach has certain affinities with the new audience studies in the criticism of popular culture, and with recent scholarship by rhetorical critics on

interpretive shifts through history. For examples of the former, see Stromer-Galley and Schiappa; Lewis; and Radway. For examples of the latter, see Mailloux; Watson; and Leff, "Lincoln Among the Nineteenth-Century Orators." My approach differs from the new audience studies in popular culture criticism in that I ask the rhetorical critic to apply *rhetorical* methods to the study of reception, rather than methodologies with which she is unaccustomed. My approach differs from the study of receptional changes over time in that I do not ask the rhetorical critic to seek a dominant reading for each particular age, but instead, I ask her to uncover how different interpretive communities may have interpreted a text at a particular moment in history. More discussion of the benefits and limitations of this approach can be found in the last chapter of my book.

⁵For example, consider the various rhetorical studies of Lincoln's second inaugural address published in the first issue of *Communication Reports*. Evidence of reception exists (see Ceccarelli, *Polysemy* 400–02), but was not examined by several rhetorical critics who made very different claims about the meaning of the text.

⁶For evidence that Gaonkar's point about scientific discourse is taken seriously in the field, see the responses of various scholars in *Rhetorical Hermeneutics*.

⁷The study to which he refers is Gross, *The Rhetoric of Science*, 129–43.

⁸Dilip Gaonkar makes the more general argument that the contemporary interpretive turn in rhetorical inquiry leads to a globalized rhetorical practice. However, in his discussion of the writings of Alan Gross and Lawrence Prelli, he suggests that it was their effort to expand rhetoric in order to accommodate scientific texts that made their readings global and thus trivial (Gaonkar, "Idea" 261–66, 282–90).

⁹The call for an expansion in artifacts was made by the National Development Project on Rhetoric in 1971; see Sloan[et al.]. For some examples of contemporary rhetorical criticism that moves beyond the restrained scope of public address, see Dow; Blair; and Warnick.

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