

When We Can't Wait On Truth

The Nature of Rhetoric in *The Rhetoric of Science*



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Poroi 10, 2 (December 2014)

Keywords: scientific controversy, sophist, epistemology, pragmatism, rhetoric of science, logic

We readily concede that the law courts and the political forum are special cases of our everyday world, a world in which social reality is uncontroversially the product of persuasion. Many of us can also entertain the possibility Aristotle could never countenance: the possibility that the claims of science are solely the products of persuasion

(Gross, 1996, 3).

As you phrase it, oratory is the craft that exercises its influence through speech. Somebody might take you up, if he wanted to make a fuss in argument, and say, 'So you're saying that arithmetic is oratory, are you Gorgias?' I am sure, however, that you are not saying that either arithmetic or geometry is oratory

(Plato, 1997, 450e).

None of this suggests that science is *only* rhetoric; no sane person could reach so bizarre a conclusion

(Gross, 2006, 78).

When *The Rhetoric of Science* was published in 1990, it helped resurrect a long-standing philosophical question: What is the relationship between rhetoric and truth? This is the question which inspired one of Plato's most influential dialogues, the *Gorgias*, which dramatizes Socrates's encounter with the aging Sophist in a raucous street brawl. Gorgias had just finished a lengthy oration, and, when pressed by Socrates, brags of the immense scope and power of his art, encompassing as it does every activity which depends on speeches and persuasion for its actualization. As the Sophist summarizes the power of oratory: "It encompasses and

subordinates to itself just about everything that can be accomplished” (Plato, *Gorgias*, 456b). In short, Gorgias begins the dialogue by setting out the proposition that truth is a product of persuasion without remainder. Socrates, however, will have none of this, and soon forces Gorgias into retreat. First, Gorgias admits that there are two types of persuasion, “one providing conviction without knowledge, the other providing knowledge” (Plato, *Gorgias*, 454d). Second, he reduces the scope of rhetoric to decisions which take place “in law courts and in those other large gatherings” in which members of the public deliberate about “matters that are just and unjust” (Plato, *Gorgias*, 454b). Although it will soon become apparent that rhetoric, according to Socrates, does not even have authority there (Plato, *Gorgias*, 502e), the opening dialectic clearly sets out the terms of the debate, with one side granting rhetoric a significant, constitutive role in production of knowledge and the other side considering it a form of flattery capable only of persuading the masses concerning subjects they know nothing about.

Reminiscent of Plato’s dialogue, Gross frames his book from the opening page as a revival and defense of the sophistical position associated with Gorgias. There, Gross introduces the guiding principle of the text, that “rhetorically, the creation of knowledge is a task beginning with self-persuasion and ending with the persuasion of others” (Gross, 1996, 3). He goes on to make explicit his debt to the sophistical tradition, writing that “this attitude toward knowledge stems from the first Sophistic, an early philosophical relativism made notorious by Socrates” (Gross, 1996, 3). Aristotle had tried to restrict the scope of rhetoric to judicial and political forums, but Gross feels this compromise to be unwarranted: “If scientific texts are to be analyzed rhetorically, this Aristotelian limitation must be removed; the spirit of the first Sophistic must roam free” (Gross, 1996, 3). This removal of the Aristotelian limitation allows him to use Aristotle’s *Rhetoric*, rather than any sophistical tract, as the “master guide to the exegesis of scientific texts” (Gross, 1996, 18). For instance, Gross uses the *Rhetoric* to explore the function of style, analogy, arrangement in scientific argument, to demonstrate that “*ethos*, *pathos*, and *logos*, are naturally present in scientific texts,” and to show that “as a fully human enterprise, science can constrain, but hardly eliminate, the full range of persuasive choices on the part of its participants” (Gross, 1996, 16). Here Gorgias is brought to life again to stimulate critical investigation into the relationship between rhetoric and truth.

Yet the productive controversy that the original publication of *The Rhetoric of Science* helped stimulate, and which Gross is rightly proud of provoking, also had the consequence of forcing him into partial retreat from the rhetorical tradition that he featured so strongly in the text. In the new 1996 preface to the original 1990 text of the *The Rhetoric of Science*, Gross still holds to the fundamental position that “Rhetoric has a crucial epistemic role in science” and “that science is constituted through interactions that are essentially rhetorical” (Gross, 1996, x). However, at the same time he defends the place of rhetoric in science, he admits, on reflection, the “relative intellectual vacuity of classical rhetorical theory” (Gross, 1996, xix). The resulting complete revision of the book in 2006, renamed *Starring the Text: The Place of Rhetoric in Science Studies*, significantly reduces the presence of classical rhetoric while at the same time tempering what he calls “radical epistemological inferences that were designed to provoke thought” (Gross, 2006, ix). In their places is a much stronger presence of the theories of language put forward by W.V.O. Quine, Donald Davidson, Nelson Goodman, and Hilary Putnam, that are used to give a “rhetorical account of truth” (Gross, 2006, 41). It is thus to the tradition of analytic philosophy, and not to classical rhetoric, that Gross looks for defense of a rhetoric of science when it needs defending.

Yet this repositioning of rhetoric still leaves the Socratic question unanswered: what, exactly, is the nature of this art that is said to be “constitutive of scientific knowledge”? (Gross, 2006, 8). Gross mounts a strong case that “rhetoric is indeed epistemic in the deepest sense,” but often at the expense of explicit reference to that tradition (Gross, 2006, 13). But by leaving the classical vocabulary behind, Gross appears to leave himself without any clear definition of the nature of rhetoric itself. For instance, it is not exactly clear what Quine, Davidson, Goodman, or Putnam would make of having their theories of language and truth be described as “rhetorical.” What could this mean? Gross offers the following answer based on their insights:

When scientific truth is a consensus concerning the coherence of a range of sentences, rather than the fit between the facts and reality, conceptual change need no longer be justified on the basis of its closer approximation to that reality. It is instead the natural result of the persuasive process that is science, a persistent effort to renew consensus, despite a constant influx of potentially disruptive sentences (Gross, 2006, 44).

If we take this passage at its word, rhetoric represents the conscious effort to create, transform, and maintain consensus concerning a range of sentences by either producing or responding to other sentences that might disrupt that consensus. Yet since all language, under a coherence view of truth, is tasked with either disrupting or producing consensus, there is no such thing as a non-rhetorical language. The only difference between scientific and political rhetoric, therefore, is in the subject matter of those sentences and the nature and scope of the audience charged with coming to consensus. The task of the rhetorician, from this perspective, thus changes from identifying and analyzing particular texts that are distinguished by their rhetorical character to disclosing the implicit rhetorical qualities that are inherent in even the most technical, scientific tract that are many steps removed from the law court or assembly.

The enduring question that persists in the wake of *The Rhetoric of Science*, even after the passing of two decades, is what remains of rhetoric when it redescribes its aims and foundations through the discourse of analytical philosophy. I argue in this essay that the turn toward analytical philosophy, represented here chiefly in the work of Quine, offers a highly sophisticated holistic epistemology at the expense of stripping rhetoric of its character as a situated art whose aim is the constitution of judgment. What remains of rhetoric in this context is thus precisely what Gross later judged it to be—a relatively vacuous vocabulary for identifying tropes, figures, and enthymemes. However, this vacuity is not intrinsic to language of classical rhetoric, but is a result of reorienting rhetoric from problems of public judgment to questions of epistemological validity. In summary, by reading Gross's work alongside that of Quine and the extant speeches of Gorgias, I suggest that analytic philosophy, while an important resource for our understanding of the nature of scientific theorizing, is an inadequate theoretical basis for the rhetoric of science, and that a "full" rhetoric of science must return to Gross's original project of enlivening classical texts to produce new insights into contemporary problems.

The Search for a "Full" Rhetorical of Science

Why *The Rhetoric of Science* remains such a provocative text is precisely the boldness of its claim. Siding with the Platonic Gorgias, Gross sweeps away the constraint of realism in order to make way for what he calls a "fully rhetorical" account of science and of knowledge. With the false veneer of realism stripped away, rhetoric thus becomes synonymous with any and all conscious efforts,

whether in science or in public, to discursively invent, articulate, and argue for an account of things that we are supposed to take to be true. Realism, that is to say, prevents a fully rhetorical description of science whenever it posits that “after analysis, something unrhetorical remains, a hard ‘scientific’ core” of “untranslatable scientific meaning” (Gross, 1996, 33). Once this hard scientific core is revealed, through the work of Quine et al., to be just one more utterance within a man-made fabric of linguistic statements that impinges on experience only along the edges, the possibility opens up of the ability to reconstruct science “rhetorically, without remainder” (Gross, 1996, 33). Gross thus argues for a view of rhetoric that does not simply appear in certain scientific contexts or situations, but is ubiquitous in every claim put forward by a scientist. The task of the rhetoric of science is clear: to use classical rhetorical terminology, such as *ethos*, *logos*, *pathos*, style, analogy, and arrangement, to redescribe all those scientific activities previously given only a rational account based on the presuppositions of realism. This is an ambitious, interesting, and partially successful enterprise. It proposes that: “If a rhetorical reconstruction describes rhetorically every aspect that a rational reconstruction describes rationally, a complete rhetoric of science becomes possible” (Gross, 1996, 34).

The revised book, *Starring the Text: The Place of Rhetoric in Science Studies*, exchanges this provocative tone for a more tempered position. As indicated by the title, Gross no longer wishes to make sweeping assertions, Gorgias-style, that all science is a product of persuasion and rhetoric without remainder. Instead, in a context in which the discipline of “science studies” have come into its own, he wishes to advocate that rhetoric has a unique perspective on science, is “one discipline among many joined in a common enterprise,” and has for its contribution the ability to “star” the “texts, tables, and visuals of science” in order to make “their hermeneutic unraveling central” (Gross, 2006, ix). *Starring the Text* thus advances a perspectival account of the rhetoric of science, suggesting that if we look at scientific texts rhetorically, we are able to gain new insights into them that would be left unrecognized when taken simply to be dispassionate representations of experience, reality, or other approaches in the meta-field project of science studies. Therefore, counter to the radical claims of his first book, he writes:

None of this suggests that science is *only* rhetoric; no sane person could reach so bizarre a conclusion. These chapters can show no more than that, like sociology, history, and philosophy, rhetoric is a discipline;

moreover, its disciplinary status entitles us to speak of all the written and visual records of the sciences from a rhetorical perspective (Gross, 2006, 78).

Classical terminology is still vital to this project, but understood as a way of looking at texts, not as a means to give a totalizing account of all of the complex practices of science that hitherto have lacked clear rhetorical counterparts.

However, this retreat from the provocative sophisticated nature of the first book—a quality that made the initial text such an effective vehicle to spark productive controversy—does little to alter its fundamental view of rhetoric itself. It remains what it was in the first text: a handbook of techniques that can be used to advocate for a position that lacks sufficient rational certainty or empirical verifiability to defend itself without those techniques. In effect, then, Gross actually accepts, in both books, the Platonic position that the difference between rhetoric and non-rhetoric is the difference between a discourse grounded in opinion (and therefore reliant on appeals to emotion, authority, and style to flatter the ignorant) and a discourse grounded in knowledge of the real (and therefore dependent only on appeals to reason to inform the wise). But Gross differs from Plato by accepting Quine’s position that there is no such thing as a discourse grounded in knowledge of the real. Therefore, although he acknowledges that science is not *only* rhetoric, this is simply meant to acknowledge that “texts depend heavily on a set of practices well outside the scope of rhetorical analysis” (Gross, 2006, 21). With respect to the *texts* of science, however, he still agrees with Gorgias, who in his *Encomium of Helen* suggested studying the “arguments of astronomers, who replace opinion with opinion: displacing one but implanting another, they make incredible, invisible matters apparent to the eyes of opinion” (Gorgias, DK11, trans. Gagarin and Woodruff, 1995). Or, as Gross says of Newton, “To move from the early papers to the *Opticks* is not to move from one science to another but from one rhetoric to another” (Gross, 2006, 74). The task of the rhetoric of science, that is to say, remains to redescribe rhetorically everything in science that we thought was purely rational. In this light, the dominant method throughout both books remains the same: to show through case studies how what we commonly think of as a purely rational procedure by which scientists make inferences about reality is actually a rhetorical exercise to gain acceptance by an audience for the validity of an utterance by using the full resources of persuasion.

Here are some examples. Regarding taxonomy: “Potential species are brought to life by giving them presence, by placing these

purposeful collections of living things at center stage in audience consciousness” (Gross, 2006, 57). Regarding Newton: “The rhetorical value of meticulous detail extends to measurement. Everywhere in *Opticks*, measurement, so important in the early papers, increases in importance; in seemingly every case, measurements previously made are remade” (Gross, 2006, 74). Regarding Copernicus: “I shall how in *Narratio Prima*, Rhetoricus justifies his choice of the Copernican over the Ptolemaic hypothesis. To do so, he goes beyond argument and evidence” (Gross, 2006, 112). In each of these examples, Gross takes texts presumed to be “rational” and shows how “rhetorical *ethos*, *pathos*, and *logos* are naturally present in scientific texts,” thus proving that “science can constrain but hardly eliminate the full range of persuasive choices on the part of its participants” (Gross, 2006, 29). Human beings, that is to say, are not mechanical logical machines; they encounter the world *as* human beings with all their capacities, desires, limitations, and assumptions, and their language about the world is always weighted, strategic, and intentional.

Consistent with the tenor of most contemporary history of science, Gross makes the important point that truths are not so much discovered as fought over, that the caretakers of knowledge in any age are bound up with structures of power and authority, and that the scientific community often accepts arguments in the short term (or even the long-term) for reasons other than pure rationality. To the extent that readers still might hold to the myth of the dispassionate, objective scientist who encounters “reality” empirically and then infers a rational “truth” based on that reality, all of these examples may come as a revelation. To them, Gross makes a further political point with respect to the authority often granted to science based on this myth. There is politics in the authority that Gross sees at work in “debates over fluoridation, the SST, and nuclear power” (Gross, 1996, 190). For him, it is important in these cases to “remind ourselves that the real issue is not the effect of particular initiatives; it is the arrogance of experts, their attempt to circumvent in their own interests the checks and balances of an open society” (Gross, 1996, 192). Thus, one of the important contributions of Gross’s work is simply to make science fallible, and to show that “the sciences create bodies of knowledge so persuasive as to seem unrhetorical—to seem, simply, the way the world is” (Gross, 1996, 207). That is why the last sentence of *The Rhetoric of Science* takes aim at realism, arguing that for rhetoricians, “Realism must remain an analytical target, a rhetorical construct like any other” (Gross, 1996, 207). From this perspective, the reason for Gross’s insistence on a “full” rhetoric of

science becomes clear: to leave any scientific “core” left behind is to leave in place the authority of expertise granted by realism that corrodes the public sphere and renders rhetoric a marginal art.

Despite the consistent assault on the tenets of metaphysical realism, Gross nonetheless draws back from a Gorgias-style sophisticated relativism that denies nature’s existence, knowability, and communicability. A rhetoric of science does not deny the validity of what we today consider “brute facts” such that “planes fly” or “men can’t have babies” (Gross, 2006, 42). As he explains, “No theory of physics can ignore flight; no theory of biology can turn its back on sex; no optics can dismiss refraction” (Gross, 2006, 42). For instance, he acknowledges that observation sentences such as “On day y, planet x exhibits a retrograde motion of z degrees of arc” were taken to be brute facts by the likes of Ptolemy, Copernicus, Kepler, and Newton because they were recurrent and reliable generalizations about specific appearances (Gross, 2006, 43). Far from denying the reality of things, he asserts that “what is stable in science is the much-denigrated world of appearances, embodied in observation sentences, the only world with which science must square itself” (Gross, 2006, 43). Here we have what sounds like a traditional assertion of logical empiricism: the view that language, while never being able to precisely “mirror” reality, nonetheless can reach reliable characterizations of reality based on repeated observations of particular phenomena captured in precise language. From this perspective, rhetoric would seem to be limited to its traditional concern with how facts come to bear on issues of practical and ethical judgment rather than arguing about whether or not planet x exhibits retrograde motion of z degrees of arc.

Still, Gross does not leave the sophisticated spirit behind. It reappears again in the view that facts are by their nature linguistic and therefore are not essentially bound to this much-denigrated world of appearances. Although Gross asserts that the rhetoric of science cannot deny or be skeptical of much that we consider “brute fact,” he nonetheless asserts that “The claim of rhetorical analysis is that the phrase *brute facts* is an oxymoron” (Gross, 2006, 42-3). For the world of appearances does not carry meanings on its surface that are simply translated naturally into the language of the mind once they are experienced. As Gross makes clear, “facts are not in the world but in our heads; they are by nature linguistic—no language, no facts. By definition, a mind-independent reality has no semantic component. It can neither mean nor be incorporated directly into knowledge. Incorporation by reference is the only possibility” (Gross, 2006, 43). In short, “while our sentences about the world are *caused* by objects and events in the world, it is we and

not the world who attribute *meaning* to those objects and events” (Gross, 2006, 42). From Gross’s perspective, rhetoric leaves the law court and assembly and becomes part and parcel of every effort to make meaning of the world of experience.

The problem is that when rhetoric becomes detached from its traditional habitation within moments of contingency, urgency, and judgment, it also loses its very character *as* rhetoric. In the case of Gross, this means that rhetoric ceases to be grounded in the perspective of Aristotle or the Sophists and instead is determined by the premises of analytic philosophy—in particular, the philosophy of Quine. Accordingly, in order to show just what kind of rhetoric Gross’s rhetoric of science is, I turn toward the work of Quine to explore the nature and consequences of his notions of under-determination, holism, and ontological relativity. I suggest that Quine’s position leads to extremely fruitful insights concerning the “reality” of the objects of science and the central importance of language, experience, utterance, and behavior within any scientific inquiry, and that any rhetoric of science can take valuable lessons away from a study of the holistic tradition of analytic philosophy. However, I also argue that simply grafting a classical rhetorical vocabulary onto Quine’s philosophy leads to the “thin” style of analysis that Gross seeks to avoid and that a “full” rhetoric of science must ground itself in the rhetorical attitude embodied in the classical tradition and its concern for judgment, not simply about matters of consensual belief but about matters of action as well.

Quine on the Pragmatics of Language

To understand what Gross means by a “fully” rhetorical account of science, we must turn to the work of W.V.O. Quine. For although the original text of *The Rhetoric of Science* underwent considerable modification in its new form as *Starring the Text*, one thing has remained unchanged: its reliance on premises of analytical philosophy largely centered on the work of Quine. In the original text, Gross quotes a passage from Quine’s most famous essay, “Two Dogmas of Empiricism,” to “make a point that is central to a view of scientific truth compatible with rhetorical analysis” (Gross, 1996, 202). The quoted passage runs as follows:

Total science, mathematical and natural and human, is...underdetermined by experience. The edge of the system must be kept squared with experience; the rest, with all its elaborate myths or fictions, has as its objective the simplicity of laws (Quine, 1980, 45, quoted in Gross, 1996, 202).

Here we find expressed three of Quine's most foundational principles, that of under-determination, holism, and ontological relativity. The first posits that no truth claim ever possesses sufficient empirical verification to render it impervious to argument; the second asserts that any truth claim only finds its meaning within a totality of the discourse that gives it its meaning; and the third argues that the meaning of any "object" encountered in sensory experience is only defined relative to a background language. Taken together, Gross asserts, these three principles carve an "intellectual space for the rhetoric of science" (202).

The emphasis I am giving to Quine may seem disproportionate to his physical presence in *Starring the Text*, appearing as he does on only two pages. Yet these two pages summarize the view of both rhetoric and science that pervades the entire text. Whereas Quine only features prominently in *The Rhetoric of Science* in the closing pages of the epilogue, his work, moreover bolstered by quotes from Davidson, Putnam, and Goodman, form the basis of the third chapter in *Starring the Text* that articulates "the kind of rhetoric science is" (Gross, 2006, 32). As Gross puts it most succinctly: "From the point of view of rhetoric, the truths of science are not beyond argument; rather, they are the achievements of argument; science rests on facts and theories that have been argued into place" (Gross, 2006, 43). Importantly, this statement is not simply an assertion of relativism or skepticism. It is an assertion that grows out of the epistemological and ontological premises of Quine's analytic philosophy, according to which sense experiences only acquire meaning by being embodied in observation sentences and incorporated within a logical system of naming and predication. In Gross's view, "Scientific knowledge represents a consensus concerning the coherence and empirical adequacy of scientific utterances," while rhetoric represents the practice of disrupting and reconstituting that consensus through argument (Gross, 2006, 43). Quine's analytic philosophy thus provides a thick foundation on which the rhetoric of science can stand. Instead of being an afterthought, Quine forms the theoretical basis of the entire book.

One likely reason Gross found Quine's work particularly salient for rhetoric is the fact that it was popularized by Richard Rorty in his highly influential 1979 book, *Philosophy and the Mirror of Nature*, which used Quine's brand of analytic philosophy (suitably adumbrated by Donald Davidson) to advance a neo-pragmatic understanding of language and truth that Rorty admits bumps up against rhetoric. Like Gross, Rorty finds in Quine's holism a clear rejection the "quest for certainty" and the conception of knowledge "as accuracy of representation," and a clear embrace of the

“commitment to the thesis that justification is not a matter of a special relation between ideas (or words) and objects, but of conversation, of social practice” (Rorty, 1979, 170). Rorty realizes, of course, that Quine, unlike himself, is no post-modernist, and that in blurring the “line between science and philosophy” Quine assumes that “he has thereby shown that science can replace philosophy” (Rorty, 1979, 171). However, Rorty, unlike Quine, sees no justification why science should be the choice over “the arts, or politics, or religion” (Rorty, 1979, 171). With certainty reduced to the pragmatic utility of background languages, Rorty sees the field now cleared for any humanistic endeavor, including rhetoric, to take up the mantle of knowledge and carry it forward. After all, for Rorty, to advocate holism is to advocate conversation, and “the ability to sustain a conversation, is to see human beings as generators of new descriptions rather than beings one hopes to be able to describe accurately” (Rorty, 1979, 378). Thus, Quine’s principles of holism and under determination free us from the chains of mind-as-mirror-of-nature realism that bind us and allows a flourishing of new, more humanistic, descriptions of ourselves and our world. This is Rorty in a nutshell.

Quine’s apparent, but unacknowledged rhetorical sensibilities would naturally make him attractive to rhetorical scholars, particularly those within the rhetoric of science who wish to use his scientific ethos to build bridges across disciplines. In order to explore the possibilities and limits of adopting his perspective in rhetoric, I will focus primarily on exploring the significance of two of his most famous essays, “The Two Dogmas of Empiricism” and “Ontological Relativity.” These make the most provocative and rhetoric sounding claims. For within this framework, questions of ontology—that is, of “being”—are minimized, and questions of epistemology—that is, of “knowing”—are equated with questions of semantics. Science thus ceases to become the study of “reality” and the representation of that reality in a discourse of “truth.” Instead, science becomes a systematic incorporation of observation sentences within a complex logical system of fictions whose only goal is to square itself with the empirical edges of the system. Here, it seems, is a view of science that opens the possibility of what Gross refers to as alternately a “complete” and a “full” rhetorical description of science (Gross, 2006, 64).

Quine’s most famous essay, “The Two Dogmas of Empiricism,” lays out his vision of holism that effectively destroys empiricism’s two dogmas and puts in their place a coherence view of truth. The first dogma is a belief that one can make a cleavage between *analytic* and *synthetic* truths. *Analytic* truths refer to those truths that are

true only in reference to the semantic rules of a language or a logic (akin to symbolic systems such as mathematics). *Synthetic* truths refer to matters of fact, presumably empirical, that refer to actual existences (such as “there are brick houses on Elm Street”). The second dogma is the belief in epistemic *reductionism*, or “the belief that each meaningful statement is equivalent to some logical construct upon terms which refer to immediate experience” (Quine, 1980, 20). However, the belief in epistemic reductionism rests upon the belief that there exists analytic and synthetic truths, or the “feeling that the truth of a statement is somehow analyzable into a linguistic component and a factual component” (Quine, 1980, 41). Quine concludes that “the two dogmas are, indeed, at root identical” (Quine, 1980, 41). Reductionism defends the abstract-sounding claims of science (i.e. “human beings have evolved through natural selection”) by asserting that these beliefs are grounded in verifiable empirical claims (i.e. “a fossilized skull with a human sized brain capacity was found in this rock formation”), which is simply another way of saying that analytic truths are built up from the bricks of synthetic truths.

Because the dividing line between rhetoric and science is often drawn at the line between *hard fact* and *mere opinion*, it is easy to understand how Quine can be read as emancipating the rhetorical perspective when he proceeds to completely undermine these two dogmas of empiricism. In Quine’s view, the analytic/synthetic distinction on which reductionism has been based has “been the root of much nonsense” (Quine, 1980, 42). The strategy Quine employs to counter both dogmas is rather simple. It involves an extension of the continued trend to see meaning, definition, and reference in terms of more and more complex structures built from atomistic bits. Moving from the “impossible term-by-term empiricism of Locke and Hume,” we first recognized that “the statement, rather than the term” should be used as the “unit accountable to an empiricist critique” (Quine, 1980, 42). But Quine urges that “even in taking the statement as unit we have drawn our grid too finely” (Quine, 1980, 42). Indeed, from Quine’s perspective, “the unit of empirical significance is the whole of science” (Quine, 1980, 42). Science is not made up of “the statements of science taken one by one,” but of the entire system of interconnections taken as a whole (Quine, 1980, 42). In fact, our individual statements themselves acquire their meaning from the “total system,” much in the way we would think that the identification of an atom is meaningless without having accepted the total system of atomic theory (Quine, 1980, 44). In this way, Quine undermines a kind of naïve belief in induction, or the sense

in which simply accumulating simple perception somehow adds up to a general theory like building a brick wall out of bricks. In reality, the “bricks” that make up the facts of a scientific theory are defined only after accepting a certain theory of bricks that is tied up with a blueprint for building walls.

Rhetorically, one natural consequence of accepting Quine’s holism is to undermine traditional realism, whether scientific or Platonic, which often was used to distinguish rhetoric from “reality.” This realism often takes the form of the correspondence theory of truth in which, in Gross’s words, “truth is the correspondence between the sentences we form and the states of affairs in the world” (Quine, 1980, 41). But in Quine, the eradication of the synthetic/analytic distinction also undermines the integrity and autonomy of the empirical facts that make the correspondence theory plausible. Since the parts take their value from the larger whole, “Any statement can be held true come what may, if we make drastic enough adjustments elsewhere in the system” (Quine, 1980, 43). Science is no longer an accumulation of bricks (i.e., stable observational facts), but is “a man-made fabric which impinges on experience only along the edges” (Quine, 1980, 42). If this is the case, it is difficult to know where science ends and rhetoric begins—at least insofar as we understand the distinction between the two discourses to be distinguished by their ability to represent reality accurately without distortion, uncertainty, or ulterior motives, a criteria that goes back to Plato (or even before Plato to Parmenides).

But this leveling of distinctions between genres of discourse is not restricted to rhetoric and science in Quine. His work levels the distinction between any and all discourses that purport to say anything about what exists, how it exists, or how we know it exists. For instance, Quine famously dissolves the ontological differences between the objects of religion and the objects of physical science. Because, for him, any isolated statement of fact is meaningless outside of a larger theory, “Physical objects and the gods differ only in degree and not in kind”; they are “conceptually imported into the situation as convenient intermediaries—not by definition in terms of experience, but simply as irreducible posits” (Quine, 1980, 44). The question is not whether gods or atoms are *actually there*; the question is how well we can integrate observation sentences about them into our larger vocabulary in a coherent manner. Quine believes in physical objects and not Homer’s gods, but he does so *not* because he can reach out and grasp their metaphysical being—i.e., not because they are more “real”—but because “the myth of physical objects is epistemologically superior to most in that it has

proved more efficacious than other myths as a device for working a manageable structure into the flux of experience” (Quine, 1980, 44). It is just here that Quine cops to American pragmatism. In other words, Quine measures the epistemological superiority of any theory by how many observation sentences about sense stimuli can be effectively integrated into a coherent network of utterances that we have warrant to believe to be “real.”

Whatever vestiges of the correspondence theory of truth may have been left behind after the assault by “Two Dogmas” are finally stripped away in his essay “Ontological Relativity.” Here, Quine explicitly rejects the “copy theory” of language on which the correspondence theory of truth is based, a theory of language that holds to “the myth of a museum in which the exhibits are meanings and the words are labels” (Quine, 1969, 27). That is to say, if the “museum myth” was true, we could point to a thing and state its name and everyone would understand what we meant by that term. However, the “museum myth” is exactly that—a myth. Instead of having a one-to-one correspondence of language to object, we have the “inscrutability of reference,” or the situation where a single word can mean many things under many conditions, and just what exactly one is talking about is often unclear (Quine, 1969, 47). In short, we have a situation where “There is no fact of the matter” (Quine, 1969, 47). What there *is* is a flux of sensory experience that makes sense to us only through the invocation of what Quine calls a “background language” that provides the context for any utterance (Quine, 1969, 48). In other words, “It makes no sense to say what the objects of a theory are, beyond saying how to interpret or reinterpret that theory in another” (Quine, 1969, 50). Ontological relativity, in sum, is a doctrine that denies that the being of entities is somehow intrinsic to the entities themselves or the sensory experiences they produce, but is relative to a theoretical language in which those entities are interpreted and defined.

Lastly, if Quine still seems to be speaking a language somewhat far from the sphere of rhetorical practice, he appears to correct it in his provocative espousal of what he calls a “thorough pragmatism” with respect to our understanding of the relationship between science, language, and sensory stimulation (Quine, 1980, 46). In his very spare form of pragmatism, “we recognize that there are no meanings, nor likeness, nor distinctions of meaning, beyond what are implicit in people’s dispositions to overt behavior” (Quine, 1969, 29). Specifically, the behavior Quine is interested in is a type of utterance made in response to a particular sensory stimulation. That is why he defines an observation sentence (quoted by Gross, 2006, 42) as an utterance “on which all speakers of the language

give the same verdict when given the same concurrent stimulation” (Quine, 1969, 86-7). For instance, on perceiving something white, small, and furry with two long ears, one might say “Lo! A Rabbit!” and receive assent from other speakers based on an implicit agreement on the validity of a background language concerning rabbits. Pragmatically, what matters is not the correspondence between our utterance and “reality” but whether our utterance expedites our dealings with sense experiences and can be ultimately validated by the behavior and utterances of those around us. It is in this latter respect that Quine translates questions of epistemology into questions of communication. Epistemology is less about what we *know* to exist and more about what we can effectively *say* what exists by gaining assent from others through our utterances.

Understanding Quine’s perspective helps make sense of Gross’s contradictory-sounding statements that, on the one hand, science is solely the product of argumentation while, on the other hand, it is not *only* rhetoric. Following Quine, science can in one way be said to be solely a product of argumentation in so far as any apparent “fact” is amenable to revision, incorporation, or rejection by making adjustments elsewhere in the discursive system. As Quine writes, “Even a statement very close to the periphery can be held true in the face of recalcitrant experience by pleading hallucination or by amending certain statements of the kind called logical laws” (Quine, 1980, 43). Yet, as indicated by this passage, defending a statement in the face of recalcitrant experience (or attempting to refute the truth of the statement consistently verified by experience) requires a considerable amount of rhetorical labor. For the most part, Quine suggests that usually it is pragmatically useful simply to accept the habitual utterances of one’s peers as valid if one wishes to get along in the world. To put it in rhetorical terms, while it is always theoretically possible to make the weaker argument the stronger, pragmatically it is not always the most prudent option.

Finding Rhetoric in the Rhetoric of Science

If Quine make sense of the apparent paradox of Gross’s acknowledging and denying the existence of brute facts, he does little to clarify what the meaning of the modifier “rhetorical” might mean in his system. It is true that Quine eradicates the correspondence theory of truth and acknowledges the importance of background languages, utterances, and argumentation in scientific inquiry. But never does he refer to any of this as particularly rhetorical. Instead, he privileges philosophy—or rather the philosophy of logic—the dominant art insofar as logic is

concerned with the cognitive and semantic relationship between words and objects. Of course, like Rorty, Gross argues that Quine's personal desire for science and logic to be the master disciplines can easily be overridden. His annihilation of the correspondence theory of truth opens the field for rhetoric as much as it does for science, art, religion, and culture. But as this essay will show, constructing a vision of the rhetoric of science based on Quine's premises alone comes with a significant price, which is the abandonment of the traditional orientation of rhetoric toward practical judgment within kairotic moments that arise in the contexts of political action and meaning.

The problem with Gross's use of Quine to assault the citadel of realism is not in its emancipatory aim. That is a well-aimed project. The problem is that the effort to reinterpret all of science as rhetoric comes with a price of stripping rhetoric of its character as a situated art. The irony of Gross's use of logicians like Quine to provide a foundation for the rhetorical analysis of science is that it presumes a definition of rhetoric drawn almost exclusively from the philosophy of science. What Gross actually does is less to redescribe science rhetorically than to redescribe rhetoric epistemologically. He sees a "full" rhetoric of science as going beyond its traditional interest in the popularization of science, science education, or the intersection of science with public policy and embracing the idea that "knowledge is rhetorical" (Gross, 2006, 7). But this is a way of saying that the task of rhetoric is not to advocate for a particular action within a context of judgment but to articulate and advance knowledge claims whose primary end is the creation of warranted beliefs about objects, laws, and processes. Yet since this is precisely what Quine sees as the goal of logic, then logic and rhetoric become effectively interchangeable arts. For Gross to use Quine to argue for a rhetorical analysis of science is to suggest replacing the word "logic" with the word "rhetoric" in his philosophy while leaving the rest of it effectively unchanged.

This colonization of rhetoric by logic in Gross is easy to miss, however, especially in *The Rhetoric of Science*, because it is masked by his surface use of classical rhetorical terminology and his insistence that Aristotle's *Rhetoric* is his "master guide" (Gross, 1996, 18). It soon becomes clear, however, that the *Rhetoric* is not, in fact, his master text, for no sooner is Aristotle introduced than Gross insists that "the *Rhetoric* must be updated," meaning in effect that rhetoric and science must be seen as differences of degree and not kind (Gross, 1996, 18). The first update we have already explored—the explicit incorporation of "relevant modern thinkers" such as Quine (Gross, 1996, 19). But two more changes stand out.

First, Gross erases the distinction between syllogistic and enthymematic reasoning, which for Aristotle meant the difference between a complete and self-contained logical argument and an incomplete argument that began with uncertain premises and relied on audience participation for its completion. Gross insists that the differences are “not in kind but only in degree” (Gross, 1996, 12). Following Quine, Gross argues that “no deductive logic is a closed system, all of whose premises can be stipulated; every deductive chain consists of a finite number of steps between each of which an infinite number may be intercalated” (Gross, 1996, 12). Consequently, the protest that rhetoric has no business in science because scientific argument does not employ enthymemes is swept away. For Gross, all arguments are enthymematic because all arguments are underdetermined and therefore are capable of rhetorical analysis. And it is important for Gross to have realized the implications of this revised logic for our understanding of scientific argumentation.

But an enthymeme is defined by more than simply its relative probabilities as opposed to its certainty. In fact, Aristotle places greater emphasis on the fact that enthymemes, as opposed to syllogism, are persuasive precisely because they invite audience participation (Garver, 1994). And it is this characteristic, and not the certainty of the premises, which has long been the identifying quality of the enthymeme. Lloyd Bitzer, for instance, argues extensively against the position that the relative completeness of an argument is what distinguishes an enthymeme from a syllogism. Instead, he argues that the defining quality of an enthymeme is the fact that it involves the “joint efforts of speaker and audience” which “intimately unite speaker and audience and provide the strongest possible proofs” (Bitzer, 1991, 408). Thomas Conley, meanwhile, defines an enthymeme as an argument whose success “is dependent on the ability of speakers and audiences to apprehend and interpret connections and differences” (Conley, 1984, 182). Consequently, even enthymemes that have certain premises remain enthymemes insofar as they bind speaker and audience together in an act of co-creation within a specific moment.

So it is really Gross’s third update of Aristotle that is far more provocative and controversial with respect to our understanding of the place of rhetoric in the rhetoric of science. This update encourages rhetoricians to expand the notion of audience beyond its situated character, relying instead on the pragmatic fiction of what Chaim Perelman and L. Olbrechts-Tyteca called the “universal audience,” or what Gross calls that “ideal aggregate that can refuse a rhetor’s conclusions on the pain of irrationality”

(Gross, 1996, 18). Scientists, he explains, usually do not write to specific individuals but to an abstract audience whose standards of argumentation they have internalized and that they take to exist not in a specific place and time but in all places and at all times. Of course, Gross realizes (just as all scientists realize) that such an ideal audience does not exist empirically. But he nonetheless claims with considerable warrant that “all scientists attribute to imagined colleagues standards of judgment presumed to be universal: not in the sense that everyone judges by means of them, but in the sense that anyone, having undergone scientific training, must presuppose them as a matter of course” (Gross, 1996, 19). The replacement of a real audience with a normative “universal audience” therefore allows rhetoricians to interpret scientific texts from the same universal standpoint without having to consider the specific contributions that a situated audience makes in order to render judgment on a particular state of affairs.

The use to which the universal audience can be put within the rhetoric of science is made more explicit in *Starring the Text*. There, Gross outlines a method of rhetorical criticism that allows for the interpretation of texts from the imagined perspective of the universal audience rather than any specific empirical one. Indeed, “It is by means of this universal audience that the natural sciences come within the sphere rhetoric” (Gross, 2006, 56). The universal audience, Gross writes, “is simply one that must be presupposed; it is the audience that scientists must see themselves as addressing when they write or speak” (Gross, 2006, 56). In the case of evolutionary taxonomy, for instance, the universal audience is the one that the scientist holds in his or her mind when trying to win them over. A rhetorical analysis would thus “show how scientists create a world that persuades their fellows, a world in which plants and animals have been brought to life, raise to membership in a taxonomical group, and made to illustrate and generate evolutionary theory” (Gross, 2006, 56-7). But by “fellows,” Gross clearly means to refer to all possible scientists who study evolutionary taxonomy, both in the present and in the future—and for good reason. What persuades a certain group of scientists at a certain time may not persuade a different group at a later time, and vice versa. Since the text can endure through time in a way that an arguer cannot, positing a universal audience allows rhetoricians to concentrate on the text itself rather than restricting interpretation to a specific audience in history.

As reasonable as this method of updating Aristotle appears, it immediately comes in tension with the situated character of rhetoric when Gross proposes *stasis* theory as a method of

rhetorical criticism of science. Stasis theory, of course, represented a way of determining what is at stake in a forensic courtroom, asking questions of fact, definition, quality, and jurisdiction in order to determine what would be the best defense for a client. By shedding the criteria of certainty of premises and participation of a situated audience, Gross is able to draw a parallel between the method by which we consider whether treason occurred and asking, in science, “What entities really exist? Does phlogiston? Do quarks?” (Gross, 2006, 22). Just as the jury of Greek heroes decides on the guilt of Palamedes after his trial, so too with Einstein and atoms: “Before Albert Einstein’s papers on Brownian movement, the existence of atoms was in question; after, their existence was regarded as confirmed” (Gross, 2006, 22). The fact that the trial of Palamedes ended in a specific judgment by a particular audience on a specific occasion (his guilt and execution) whereas the “trial” of atoms is an ongoing affair before a universal audience is not a factor in Gross’s account. In the updated Aristotle, it is not particular judgments by situated audiences that matter but provisional consensus about knowledge claims arrived at in the ongoing deliberations of a particular epistemic community.

This is why in the updated Aristotle, it is actually Quine, not Aristotle, who becomes the master guide of rhetorical analysis of science. The reason is that Quine is also unconcerned with matters of particular judgment that call audiences to action. The only “action” Quine is interested in is the act of consensual utterance, of saying “yay” or “nay” to statements like “Lo! A rabbit!” He is not interested in prosecuting the rabbit, hunting the rabbit, killing the rabbit, experimenting with the rabbit, genetically modifying the rabbit, or buying the rabbit as a pet for his kids. For in each of these situations, one must make a practical judgment about the rabbit in relationship to the desires of an audience and the constraints of an immediate situation. Once the demand for *praxis* becomes paramount, all manner of motivations, like anxiety, credibility, love, hate, passion, trust, and urgency, suddenly become highly influential—as Aristotle recognized by making *ethos* and *pathos* constitutive modifiers of *logos* in rhetorical argumentation. For Quine, all of these motivations, while obviously important *in the moment*, are ephemeral and distracting from the purely epistemological question of whether or not we have sufficient warrant to categorize a certain nexus of sensory stimuli as a “rabbit” or some other object. Thus, as David Depew has observed, in contradistinction to pragmatists like John Dewey, who “tried to naturalize the intention-laden and meaning-full world that humans share in their daily life...Quine’s naturalism extended no further

than ‘extensionalist’ ontologies that allow the inferential apparatus of propositional logic to map onto the physical world that impinges on agents in such a way that bits of behavior are elicited and shaped in response to it” (Depew, 1995, 115). In other words, Quine was largely uninterested in the mundane world of practice that so infatuated the earlier pragmatists. For Quine, it was obvious that this or that person may refer to this or that nexus of sensory stimuli in all manner of ways, sometimes for strategic purposes, sometimes for humor, and sometimes because they are operating under hallucination. But none of this matters for logic. What matters is the clarity and long-term reliability of a denotative designation across multiple circumstances and communities. But that is something other than the art that we tend to associate with rhetoric.

The *Kairos* of Classical Rhetoric

If there is anything distinctive about the classical rhetorical tradition, it is its attention to the power of the persuasive word when spoken in a timely moment of choice. It is this difference in the context of the speech act, and not the difference between the “truth” of what he said, that distinguishes rhetoric from logic. One sees the difference between the two arts in Gorgias’s *Defense of Palamedes*. Palamedes defends himself against charges of treason and appeals to his audience of Greek heroes by appealing to their fear of making the wrong decision. He says: “If it were possible to make the truth of actions clear and evident to listeners through words, a decision based on what has been said would now be easy. But since this is not so, safeguard my body, wait for a while longer, and make your decision with truth” (Gorgias, DK11, trans. Gagarin and Woodruff, 1995). Here is the difference between the two arts. Logic, unconstrained by situated demands of judgment, hypothetically has the luxury of waiting not only longer but forever. The day of judgment never comes with logic, only the day of revision and reconsideration. But rhetoric must throw its full force behind a judgment in the moment, rallying whatever resources it can to advocate for a choice here and now. The stakes are high in rhetoric, as Palamedes warns his audience: “If you kill me unjustly, it will be evident to many; for I am not unknown, and your wickedness will be known and evident to all Greeks. For this injustice you, not the accuser, will be blamed in everyone’s eyes, since the outcome of the trial is in your hands” (Gorgias, DK11, trans. Gagarin and Woodruff, 1995). Palamedes can make this argument because a sentence of guilt made in his trial is irreversible. Later logical analysis of evidence may find him

innocent, but it cannot bring back his life. That is something that must be defended with rhetoric and with all resources he can muster.

From the classical perspective, rhetoric arises whenever we feel the pressure to make a choice under constraints and uncertainty. In those situations, all realists, materialists, idealists, and relativists embrace rhetoric not because they want to but because they must. Thomas Farrell, channeling the non-updated spirit of Aristotle, aptly describes the context under which rhetoric arises:

When we have some stake, or interest, in the array of things around us, for instance, we are not likely to be concerned with an underlying cause or a larger, more inclusive general opinion. For the particularity of things has become a provocation. We cannot leave well enough alone. We also disagree about things. We may try to ignore them. We may take issue as regards what they mean. Eventually—perhaps sooner than we wish—we may have to own up to them, make judgments about them, and act on them. This is the tension that Aristotle captures with his rhetorical mood of *contingency*. Here we suddenly have the unsettledness of appearances, wherein differences are crystallized in opposed directions which may be resolved one way or the other (Farrell, 1993, 27).

For Aristotle, then, it is the mood of *contingency* that calls forth rhetoric as a productive art, just as it is the identification of texts that move people to action within contingent situations that calls forth rhetoric as a suitable mode of criticism. According to him, the subjects of rhetorical deliberation “are such as seem to present us with alternative possibilities” (Aristotle, *Rhetoric* 1357a5, trans. Roberts, in Aristotle 1984). Aristotle treated rhetoric as an art of putting people in a frame of mind that make certain possibilities more attractive than others in moments of choice, thereby making any rhetorical criticism grounded in Aristotle an art of retrospectively determining why specific texts had the power to move real audiences in particular ways within in those moments.

Aristotle, in short, makes the art of rhetoric an explicitly *situated* art. Rhetoric for him is inextricably bound to the contingency of the moment, the motivations of an audience, and the imperatives of judgment. It is only within these situated moments that the full power of such rhetorical proofs as *ethos*, *pathos*, enthymeme, and style become instruments for achieving a practical and political aim. That such proofs inevitably find their

way into even the most technical exposition is beyond a doubt, as Gross aptly demonstrates. Language being a human art, it will always convey some aspect of our humanity, including our biases, our desires, and our fears, and so even the most “dispassionate” scientist is not immune to its appeals. What makes scientific discourse different from rhetoric has little to do with the degree of “persuasiveness” of any text looked at only *as* a text. The difference is found in the contexts in which those texts operate. Most scientific texts operate in contexts in which no practical judgment is called for beyond a consideration of new truth claims and a reconsideration of old ones within the pages of academic journals. Rhetoric, by contrast, operates in context in which our choices make differences that cannot be so easily undone and that directly bear on matters of practice. Scientific argument thus becomes rhetorical when those judgments about “truth” intersect the realm of prudential judgment. It is at this point that scientists, often involuntarily, find themselves thrust into a public scientific controversy that makes hitherto obscure technical debates matters of rhetorical deliberation (Crick and Gabriel, 2010). It is thus the context in which scientific arguments are deployed, and not the specific content or epistemological validity of those arguments, that makes them rhetorical and thereby amenable to rhetorical analysis.

Yet the majority of case studies Gross investigates tend to downplay if not overlook entirely the situatedness of any discourse. Instead, they focus on showing how “rhetoric” (understood as any effort at constructing a persuasive argument) is somehow present in situations that we would not otherwise think of as rhetorical—i.e., situations in which there is no clear judgment to be made. But little of this analysis, it turns out, requires any knowledge of rhetoric. The analysis of both Descartes and Newton is actually a philosophical critique of their metaphysics and methods. The reading of Darwin’s notebooks indicates the importance of making diagrams in the generation of tentative theories. The complex political climate in which Copernicus published his theories is reduced to a single non-rhetorical problem: “to make coherent physical sense of the apparent behavior of celestial objects” (Gross, 2006, 112). The existence of peer review proves quite emphatically the lack of situatedness in science insofar as any claim “is neither scientific nor knowledge until it is the conviction, not merely of the individual or even a small group of like-minded adherence but of a broad consensus of practitioners” (Gross, 2006, 98). The debate over cold fusion hammers home that point that even the strong emotions tied up with intellectual rivalries between disciplinary communities can be overridden by “means of experimental

disconfirmation” pursued rigorously and methodically by those communities (Gross, 2006, 133). In none of these cases does the incorporation of the rhetorical tradition add anything substantial to the analysis, a claim verified by the fact that beyond the use of the word “rhetorical,” Gross incorporates none of the tradition to illuminate any aspect of these artifacts or situations. If anything, it demonstrates Quine’s point that logic, at least once suitably relativized, is sufficient to understand the scientific process without any need for its rhetorical counterpart.

From a classical standpoint, however, if there is no judgment to be made and no action to be done, then all the strategies of rhetoric are so much wasted breath. For instance, what use is it to deliver an impassioned defense of one’s innocence at a pre-hearing in which the only concern is for the admissibility of facts in a court trial? Even if an audience was persuaded by one’s innocence, that is not the task at hand. But for a universal audience tasked with determining the epistemological validity of a scientific claim across time, the actual trial never comes. One simply has a never ending series of pre-hearings concerning the admissibility of facts and their relevance to theoretical assertions. In contradistinction, what makes the cases of historical figures like Darwin or Copernicus so fascinating for rhetoric was how their work had to overcome significant institutional, political, and religious resistance to even have their truth claims given a hearing. To the extent that their works overcame that resistance and influence the action of specific individuals, they are rhetorical. But insofar as their works contributed to the long-term development of established scientific theory based on a sustained investigation by a community of inquirers into validity of their truth claims with respect to accumulated empirical evidence, they are works of logic. This distinction has nothing to do with which discipline is more “true seeking” than the other or which text more “persuasive.” It has everything to do with whether or not we are more interested in the relationship between words, objects, and meanings than we are in the relationship between speech, action, and power.

A Classical Rhetoric of Science

The irony of trying to “find” rhetoric in science is that rhetoric rarely needs to be found. Its very nature as persuasive art is to always be out front and to be experienced as a challenge, not just to a community of minds, but to an audience of actors. And it is important to emphasize that Gross, too, celebrates this characteristic of rhetoric as a situated, quasi-political drama. In the chapter on “Science and Society,” Gross turns to the action by West

Virginia miners who fought to have black lung disease redefined in their interests in order to change both their working conditions and their ability to acquire compensation in the event of acquiring the disease. The problem they confronted was that black lung had been defined in such a way that it was difficult for miners to prove the causation that would lead to compensation. As Gross writes, “Until phosphorus necrosis, asbestosis, or byssinosis is defined by a medical science driven by the cognitive technical interest, neither match workers, tile workers, nor cotton workers can sicken and die of it; therefore their complaints are without an object” (Gross, 2006, 155). Here is a case in which the conclusions of science are perceived to influence the lives of individuals, directly or indirectly, and thereby become relevant to ethical and political judgment.

Notably, Gross identifies the specific point—a “breach”—at which what had been largely a question of logic and epistemology suddenly erupted into a public scientific controversy that involve multiple rhetorical actors. This event was a mine explosion in 1968 which led to a “breach in the existing moral order—public anger among the miners followed by political action” (Gross, 2006, 153). Specifically, the miners unleashed a “fiery rhetoric aimed at the reform of the existing moral order,” and through such “histrionics” as mock funerals in the displays of diseased lungs to the press and legislators, the miners “initiated an insurgency that eventually provided more liberal compensation for Black Lung” (Gross, 2006, 154). Notable about Gross’s analysis, too, is the attention he gives to specific (i.e., non-universal) audiences who were mobilized to act in response to particular rhetorical appeals made in the heat of the moment:

From their early insurgency in the cold fields of West Virginia to their successful fight in Washington, the miners would have achieved little were it not for outside funding and the help of sympathetic legislators, physicians, and news media, competent attorneys working for a pittance, VISTA volunteers, and community organizers. It is these professionals who gave the miner’s organization its leadership and its focus. Without the deep-seated and general discontent of the miners, it is true, these outsiders would have achieved nothing, but there is no denying either that the power of the workers was mediated at each step by those willing to defy the interests of the class from which they came (Gross, 2006, 157).

How different from the context in which Gross analyzes the work of Copernicus, Darwin, or Descartes! Here is a drama of multiple

actors interacting within a moment of particular judgment in which science comes to bear as a warrant for decision-making. Only in this case, the scientific consensus was challenged by a rhetoric of social action by ordinary citizens faced with urgent problems, a rhetoric that made legislators, business leaders, and scientists make specific choices that determined both the course of future research and the policies that are out of those research agendas.

What Gross makes vividly clear in this case study is the fact that most rhetorical actors do not need to go through a long detour through analytic philosophy to call into question the realist doctrine of “brute facts.” In a rhetorical situation, all audiences take as “brute facts” those appearances that help their cause, just as all audiences take as “fictions” those accounts that are used to override their interests and refute their positions. The history of the word “fact” is, in fact, bound up with such selections (Poovey, 1998). The miners certainly would have little patience for Quine’s effort to problematize their utterance “Lo! Black Lung disease!” by showing how it was underdetermined by experience and relative to some background language. What they wanted was safer working conditions and compensation for what they believed to be a disease caused by excessive inhalation of coal dust. Similarly, an industry funded scientist might actually fully acknowledge that science is a man-made fabric that impinges reality only along the edges, but once thrown into the context of political deliberation, would speak the language of “brute facts” simply because her conclusions were being challenged by a motley crew of miners, attorneys, and activists. For what matters in rhetorical action is not some abstract belief about the existence of objects. What matters is how any belief can be used to leverage judgment in a particular case.

Gross argues in the closing pages of *Starring the Text* that rhetoric is not simply after the advancement of knowledge claims within some ongoing ideal speech situation; it deals with “symbolic interaction in the sphere of social action” (Gross, 2006, 179). To find a place for rhetoric in science studies is therefore to find those places in which science intersects with the sphere of social action. This does not mean simply restricting rhetorical studies of science to science policy, however. It occurs at any point within scientific inquiry—even the most theoretical—in which specific audiences are tasked with making judgments and performed actions that turn a situation this way rather than that way, and when those judgments are influenced by a whole range of rhetorical appeals that are brought to bear on a moment of choice. For as Aristotle wrote, “The duty of rhetoric is to deal with such matters as we deliberate upon without arts or systems to guide us,” and “the subjects of our

deliberation are such as seem to present us with alternative possibilities” (Aristotle, *Rhetoric* 1357a1-5, trans. Roberts, in Aristotle 1984). These deliberations happen at all levels of human practice, for social action does not mean non-scientific action. It simply means action performed alongside interested others for the pursuit of aims, interests, and resources that are more than simply epistemological. And that we feel warranted to pursue this type of inquiry today without apology is in large part due to the work of Alan Gross, who accomplished that most difficult and laudable of intellectual goals that Aristotle also attributed to the Sophists—the beginning of something new.

To pursue the rhetoric of science is to find those moments within a process of inquiry in which actors are presented with alternative possibilities and must make practical judgments without other arts or systems to guide them. These are moments when an individual scientist must decide to pursue one or another course of inquiry, when institutions must open or close their doors to particular ideas that have an impact on the world of practice, when citizens must mobilize to make their voice heard against a institutional forms of power that use knowledge as a weapon, when public intellectuals are called upon to take their scientific ideas to a recalcitrant public uninterested in challenging long-held beliefs, when scientists appeal to their peers within crisis moments of their discipline, when scientific claims become warrants for practice, and when political practice threatens to overturn the assertions of science. These are moments of drama, of conflict, of heroism, of tragedy, of battle, of victory, of invention, of uncertainty, of possibility, and of beauty. The duty of rhetoric is to illuminate these moments in the practice of science in order to show that the achievement of knowledge is always a struggle and that rhetoric appears at those moments in which a battle must be won so that truth (at least as we conceive it) can have a chance to prevail in a world in which we live, move, and have our being.

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