

Penultimate version. The final version appeared *Visions and revisions: issues in rhetoric and composition*. James Williams, ed. Carbondale: Southern Illinois University Press, 2002, 163-219.

Knowing, rhetoric, science

The grace of a city is excellence of its men, of a body beauty, of a mind wisdom, of a speech truth.

--Gorgias of Leontini

For a very long time--blame Plato--rhetoric and knowing were antithetical. Not anymore.

Especially in the last decade of the last century, rhetoric and knowing have moved into closer and closer alignment. More correctly: they have moved *back* into closer alignment. Plato, the Great Satan of their disunion, drove them so far apart that even when his epistemic alternative collapsed they remained profoundly alienated. Even now, there are various backlashes, boredoms, and dogmas which repudiate the realignment. But they have come back into the same compass, a situation which is (1) the most important development over the last thirty years in the twinned fields, rhetorical theory and rhetorical criticism, and (2) in happy synchronicity with the most important general development in human inquiry over the same period, the remarkable growth of cognitive science.

The initial rhetoric/knowning alignment--the one associated with Sicilian and Thracian and Athenian thinkers like Empedokles, Gorgias, and Protagoras--was speculative. It came from the hopeful, experimental application of poetic language in arguments addressed to the questions provoked by the impingements of reality. The current alignment results from the manifold inadequacies of the alternate epistemic programmes in the subsequent 2500 years, including the excruciatingly thorough and dedicated attempts by philosophers since the enlightenment to drive language to the peripheries of knowledge-making in science, overwhelmingly the most successful epistemic engine we have.

In the theory shop, the realignment of rhetoric and knowing began with the rhetoric-as-epistemic conversation opened by Robert Scott in the late 1960s. Scott offered "that truth can arise only from cooperative critical inquiry", from rhetoric (1967:9). He probed issues of belief and knowledge and argumentation until the only certainty seemed to be uncertainty, and the dominant ways of mitigating uncertainty were rhetorical. He noticed what Gorgias noticed: that truth is a product of discourse, not a substance added to it. The grace of a city might change as excellent men die, are raised up within it, or immigrate; but the men are not other than the city, they are constituents of the city. The grace of a body might change with age, exercise, diet, disease, but beauty is a manifestation of the body, not a property overlaid upon it. The wisdom of a mind might change

with age, exercise, diet, disease, reading, living, failing, succeeding, but wisdom is not something plopped into a mind; it is an emanation of mind. Truth is of language, not in language. Scott, in attending to this rediscovery, had many respondents and allies, who in turn had respondents and allies; talk of rhetoric and knowing dominated theory through the eighties.

In the criticism shop, the realignment of rhetoric and knowing draws its richest sustenance from the movement labelled by Philip Wander's "The rhetoric of science" (1976). Wander's proposal was that the phenomenal penetration of science into all the recesses of modern life, and especially into the public sphere, obliges rhetoricians to investigate its discourse. Despite a rather sophistic beginning--"At any given moment, what we know to exist in the world is the product of an evolving set of agreements" (1976, 226)--and despite all the epistemological debate engendered by Scott's initiative at the time, Wander was largely indifferent to questions of knowing. It escaped no one's notice, however, that the main job of science is to produce nuggets of knowledge, hard and true.

So, while the first alignment was speculative, the new alignment is strongly empirical. Analysis after corroborating analysis of scientific discourse has rolled in over the last two decades, not just from rhetoricians but from sociologists, from historians, and even from philosophers, that reveal this axiom and that model, these data and those theories, this methodology, that programme, to hold their adherents through mechanisms central to the rhetorical tradition. This movement--"the rhetorical turn" Richard Rorty christened it (Simons 1990, vii)--is not without its horrified detractors, Plato's children, who want to restrict rhetoric to a glib and oily and hopelessly peripheral role in matters epistemic, required, if at all, only because of widespread rational degeneracy.

I will talk about them shortly, and generally about the developments around the realignment of rhetoric and knowing that strongly defined rhetoric at the close of the last century--the theoretical debates around knowledge and suasion and the legitimate scope of rhetoric--but I am going somewhere quite specific in all of this, and I want to take you with me. I am after the *how* of epistemic rhetoric. That's an absurdly hard question to get at with any particularity, of course, but I think we can close in on the right programme for addressing it, because the critical groundwork has been done. Not only was the overall shape of the sophistic answer right on this one--rhetoric begets knowing--but the methodology is immensely promising as well. The linguistic soil that many sophists cultivated for the growth of knowledge--poetic language, figuration--is much more fecund

than contemporary rhetoric has noticed. Aside from metaphor and a tiny handful of its high-profile cousins, figures, tropes, and schemes have long been little more than an embarrassing reminder of the shallowest notions of style. But (aside from the appreciation for metaphor) this is utterly backwards. Figuration runs as deep as it is possible to run. Language cannot but be figured; it flows in what Edward Sapir figured as "well-worn grooves of expression" (1921, 89). These grooves can be optimized to aesthetic or suasive ends (or, rather, almost always, both; Segal 1962, 119ff)--which is where formal theories of figuration come in--but there are no other grooves.

Figurative analysis is revealing, in the shallow sense, because when you look at issues of belief and knowledge in argumentation figures are always there, always working, and always doing the same job: begetting belief and knowledge. It is revealing in the deep sense, too, because of what the presence of figures, and their performance of that job, tell us about ourselves: that is the way (human) knowers work. That is the way our brains percolate. Rhetoric is cognitive.

Knowing, rhetoric

The speaker, who is trying to communicate to another, speaks words, not colors or things.

--Gorgias of Leontini

To ground everything that follows, I offer some ridiculously simple assertions about rhetoric and knowing.. I make this offering in the naïve hope that I can avoid the sorts of hysterical moaning that affirmative discussions of rhetoric and knowing often trigger.

At least as far back as our species goes, perhaps as far back as any species goes, we have had two bedrock truths.

1. There is an out-there out there.
2. We receive sensory data about the out-there.

These two claims, it is true, have been subjected to various skepticisms. Here's a famous pair of antithetical propositions, from (Sextus Empiricus's paraphrase¹ of) Gorgias's *On Nature* (*Adversos Mathematicos* VII 65):

α. Nothing exists.

(= There is no out-there out there; in fact, there's not even a here.)

β . Even if anything exists it is inapprehensible by man.

(= OK, let's say there is an out-there out there: we have no access to it.)

But, of course, these claims evaporate under even the most casual inspection. The form of each is antipathetic to its sense. Or, given Gorgias's reputation for verbal hijinx, perhaps the form is best construed as antiphrastic (in humorous opposition) to its sense. Claim α is an utterance which denies, amongst all else, the possibility of uttering; to utter, write, paraphrase, or even think Claim α is to grant the existence of *something*. Claim β entails a perception which denies the possibility of perception. To hear, read, or even think Claim β is to apprehend *something*. We can certainly utter noises (make marks) like 'nothing exists'--there, I just did--and we can certainly perceive noises or marks like 'nothing is perceivable'--there, you just did--but can we really believe them? Not for very long, I think, and fit the adjective, *sane*. They are nonsense.

The power of Descartes's answer to nihilism of the α -sort and radical skepticism of the β -sort—the power of *cogito, ergo sum* (*Meditations*)--is in its bedrock inevitability. Ditto, Augustine's *si fallor sum* (*City of god*, 11:26). *Any* talk of knowing entails being. Even with elaborate games like "what if a demon is deceiving me?" it requires neither an Augustine nor a Descartes, nor even a Johnson, to stub one's epistemological big toe on the boulders of "minimally, *I'm* here (else, I couldn't be wondering)" and "minimally, I have inputs (else, the demon couldn't be feeding me these impressions)". We know there's an out-there out there and we know that it has implications for our personal in-here. We know there's stuff besides us, and we know it impinges on us in some way. We can, and regularly do, doubt the reliability of impingements, but not the impinging ("What is doubtful is not the existence of the world," says Dewey, "but the validity of certain customary yet inferential beliefs about things in it", 1989, 49).²

Gorgias, however, was not finished:

χ . Even if anything is apprehensible, yet of a surety it is inexpressible and incommunicable to one's neighbor.

(= OK, OK, let's say not only is there an out-there out there, let's also say that we have some access to it: we still can't talk about it, and nobody would understand us if we did.)

Now it gets interesting. Now we have a robust proposition on the table. Now there's a claim which does not collapse under the weight of its own absurdity. It's wrong. But it's not flimsy. We can only guess about Gorgias' commitment to Claims α and β , although the presence of the *even*-conditional in β confesses the

weakness, if not the outright lunacy, of α , and the *even*-conditional in χ says pretty much the same thing about β (Cole 1995, 99-100). And, remember, Gorgias is the wise guy who concluded his *Encomium of Helen* by enumerating the ways in which he has proven Helen's innocence, by bragging that he has dispelled her infamy, by claiming to have banished injustice and ignorance; and, then, in the very last phrase, by saying the whole thing was simply "an amusement for myself". *On nature*, which takes a stance toward gut-level empirical knowledge very similar to the one *Encomium* takes toward received wisdom (Untersteiner 1954, 102ff), is more playful yet, rife as it is with Zeno-esque parlour tricks and cascading antitheses.³ Even the title (more fully, *On what is not, or on nature*) warns us to strap ourselves in for a careening, plunging ride on a rhetorical roller coaster; it is "a self-negating claim, a saying which unsays itself" (Wardy 1996, 15), a paradox,⁴ as, in fact, are Claims α and β . Small wonder, then, that the whole argument has often been written off as a banal joke.⁵

Nobody, however, is laughing at Claim χ ⁶. It's wrong. But it's not laughable. Whatever there is, whatever access we have to it, we are all aware of the difficulty of getting others--students, neighbors, children--to know it in the same way as us, and by their reporting back, to have assurance that we now know that they know what we know in the same way as we know it. The real problems of knowledge--as hyperactive discursive industries in the humanities and human sciences are consumed with exploring--do not concern the hermetically encapsulated existence of trees and rocks and the accuracy of sensual impressions therefrom, but the symbolically encrusted existence of trees and rocks and sensual impressions therefrom: the customary yet inferential beliefs about trees and rocks and sensual impressions therefrom. "Since the existent subsists externally," (Sextus says that) Gorgias says, "it will not become our speech" (*Adversos* VII 84). Or, in Derek Bickerton's terms, "simply by virtue of being representations, representations cannot represent with absolute verisimilitude" (1990, 26). Any theory of knowing which insists that what is expressed and what is apprehended are isomorphic--that what is in my head when I utter X, and what is in your head after hearing me utter X, and what obtains of the world to which X points, can all be mapped one-to-one unproblematically via the utterance, X--is, we know, doomed. As two millenia and more of theory talk tells us--not to mention the french fries that arrive with your steak when you thought you ordered a baked potato, or the fact that you're probably still trying to figure out what the hell my use of "X" was supposed to illustrate in the previous

sentence--that is just not the case. Misunderstandings are inevitable eddies—sometimes growing to vortices—in the currents of discourse.

But: Claim χ is just as doomed as Claims α and β , for somewhat different reasons. It is not a content/form paradox, like α , nor a content/function paradox, like β . It is a content/theory paradox: the nature of rhetoric renders it otiose. When there is a rhetor, an audience, and an utterance, the structure of the situation insists that, however partial or clumsy or flat-out wrong it may be, communication is underway. I would therefore like to propose another fundamental truth. It is not as ineluctable as Claims 1 and 2. Anyone sufficiently stubborn can still seek refuge from it in a demons-might-be-tricking-me move, or an it-could-all-be-just-a-dream move, or a maybe-I'm-only-a-brain-in-a-vat move, or some other perversity. But it is a truth presupposed by rhetoric:

3. We communicate.

Claim 3 opposes Claim χ , of course (*communicate* entails *express*), but its opposition is only to the certainty, the surety, that χ asserts, not to the general playground χ implicates. Claim 3 does not say that we succeed in all the aims of expression and communication--that my X easily becomes your X. It only rejects the guarantee of failure that χ issues. Indeed, the possibility of failure necessitates rhetoric; the partial, the clumsy, and the wrong are where rhetoric comes in.

But rhetoric always comes in. The nature of symbols is such that expression and communication are necessarily wrong at a profound level. What we communicate, as Gorgias says when he gets around to granting the possibility of communication, "is not the same as that which the senses perceive and [which] actually exists" (84), not colours or things. Or, if Gorgias is too much of a joker for your liking, take it from Dewey, a couple of thousand years closer to us: "that color is visual is a proposition about color and it is a proposition which color itself does not utter" (1989, 39). We don't argue and converse and orate through objects, nor through immediate sensations, but through words, *logos*. (We do communicate, and even argue, through objects, of course--as one of my students has observed, a pierced eyebrow is a statement; it says something, and what it says stands in opposition to the statements other objects make--but these are not objects qua objects. They are objects qua *logos*, symbols.) "The final proposition" of Gorgias's argument, says Susan Jarrat, is a positive one, "that what *can* be communicated is *logos*" (1995, 207).

I'm not so sure that Gorgias has a final proposition to *On nature*, or, if he does, that Jarrat captures it; if Plato is the Great Satan of the history of rhetoric, Gorgias is its Slippery Fish. But I am sure that we communicate--so, I'm guessing, are you (you're *reading*, aren't you?)--and that what we communicate is logos, not objects or impingements; and that the inevitable slippage in this arrangement necessitates rhetoric, suasive exchanges of claims about objects or impingements; and that rhetoric about objects and impingements gives us very close to all that we know about them.

Since logos cannot be absolutely anchored in the out-there, and since we require logos to calibrate the impingements we experience of the out-there, Sextus (prefiguring a host of subsequent epistemological worry warts) frets that "the whole criterion of truth is swept away" (*Adversos VII 87*) by Gorgias's case in *On nature*. But the very essence of rhetoric is profoundly pessimistic about Claim χ , profoundly optimistic about Claim 3. To mount a case--which includes mounting a case against mounting a case, a la *On nature*--is to reject χ and throw your lot in with 3.⁷ That much is trivial. Of considerably more interest is that the whole criterion of truth, far from being swept away, is in fact provided with the most secure moorage available; indeed, the only moorage available, language. Just because one admits that language constructs truth, one is not committed to the position that all constructions are equal: one might still hold, say, that deductive arguments using enthymemes, and inductive arguments using examples, create more consistent, justifiable, and robust truths than arguments drawn from ethical or pathetic appeals. "Even if one chances for the most part to say what is true, still he would not know," Xenophanes said, years before Gorgias, millennia before Gödel. That is the 34th fragment in Diels's catalogue. The 35th is: "These things have seemed to me to resemble the truth" (Nahm 1934, 85 - 86). The interesting job of language follows from that seeming, from that resembling, from rhetoric.

I belabour these points because this essay advocates what Shanyang Zhao calls the non-restricted version of the strong claim of the rhetoric-as-epistemic problematic (1991, 255): dejargoned, I hold that almost everything we know, we know through rhetoric. But Zhao, and others, confuse this position with an ontological claim. He thinks that it means something like without rhetoric there would be no out-there, or that there are no impingements, that we puny humans give birth to the cosmos with our semantically invested yelps and hoots. But the strong claim has no such implications. It simply implies that we get our versions of the out-there through our impingements and our rhetorical calibrations of those impingements.⁸ Which brings us to science, systematic rhetoric about objects and impingements.

Rhetoric, science

But come, examine by every means each thing how it is clear, neither putting greater faith in anything than in what is heard, nor in a thundering sound more than in the clear assertions of the tongue

--Empedokles

Claims that science relies (more or less heavily) on rhetoric are now ubiquitous. Within rhetorical studies, these claims are part of a strong programme of criticism that sees all discourse manifesting, in various degrees, suasion. More broadly--in sociology, history, philosophy, psychology, literary and cultural criticism, as well as in rhetoric--such claims are the legacy of the theory-change debates radiating out from the work of Thomas Kuhn.

The strong programme of rhetorical criticism took flight in the eighties, with a flock of case studies exploring in narrow focus the arguments of Darwin, of Galileo, of Newton, of Watson and Crick; exploring, in somewhat wider focus, the implications of debate, of popularization, of peer review, of reading; exploring, collectively, the rhetorical dimensions of arguing and believing and knowing in science. Meanwhile, historians and philosophers adopted perspectives which gave significant roles to figuration, constitutive debate, and suasion. Sociology of Scientific Knowledge exploded into an academic and cultural force, providing the overwhelming bulk of the warrants for social constructivism, a Protagorean epistemology whose strongest credentials come from analyses of scientific discourse. The decade closed with landmark rhetoric-of-science monographs by Charles Bazerman and Lawrence Prelli.⁹

The nineties saw these developments gather momentum, but also saw a concerted rearguard action against the strong programme. The decade opened with Alan Gross's very influential *The rhetoric of science* and Greg Myers's brilliant *Writing biology*; it closed with Jeanne Fahnestock's marvelous *Rhetorical figures in science*. In between, came important books by Marouf Hasian (1996), Charles Alan Taylor (1997), Dwight Atkinson (1999), and Celeste Condit (1999), and significant collections by Jack Selzer (1993), Henry Krips, J. E. McGuire, and Trevor Melia (1996), Harris (1997), and Alan Gross and William Keith (1997). Investigations of, and commentaries on, scientific discourse from (more or less) rhetorical perspectives in history, philosophy, and especially sociology of science are now too numerous to chart.¹⁰ The rhetorical turn has rounded the bend.

But not everyone is happy. Accompanying this dilation is considerable anxiety (Allard, 2000). Even some participants in the movement are nervous about rhetoric of science. Several essays in *Science, reason, and rhetoric* (Krips, McGuire, and Melia, 1996), for instance, are preoccupied with not appearing too uppity; the editors, in particular, are careful to distance themselves from Gorgianic hooligans,--bogey-men rhetoricians who (allegedly) view science as not "a truth-producing enterprise", since "even if truth were available we might not be able to recover it or communicate it",--Krips, McGuire, and Melia, vii).¹¹

Fleeing Gorgias leads to Plato's doorstep, and the defining theme of theory talk surrounding rhetoric of science in the nineties was the Platonic case prosecuted by Dilip Parameshwar Gaonkar against the very possibility of rhetorical criticism.¹² The brunt of the case is that rhetoric is historically a productive enterprise, like architecture, or sculpture, or engineering. It is a body of principles for *making* things, and very specific things--orations--and is therefore methodologically ill equipped for the *investigation* of things, especially things which are not canonically generic orations. Here is the central complaint

[The productionist vocabulary] as a language of criticism is so thin and abstract that it is virtually invulnerable to falsification, and for that very reason, it commands little sustained attention. (1997a, 32)

The concern--what he means by "thin"--is that neoAristotelian notions are so capacious one can detect their "presence in virtually any discourse practice" (1997a, 32). Therefore, pointing to scientific discourse and saying "Lo, suasion" or even "Lo, ethos" is empty. The argument is a ramified chain (a gradatio, as Simons renders its structure, 1999, 88-9), with many other links, some faulty, some solid, and it is the globalised hermeneutical project of contemporary rhetoric--what I am calling the strong programme--that is the ultimate target. Rhetoric of science, as the "Mount Everest of globalization" (Simons 1999, 89), is just the extended metonym of Gaonkar's animus.

And it really does all come down to this charge of lexical anorexia. Gaonkar says we can't talk meaningfully about science through the language of our discipline because the language just doesn't apply. Even worse, extending rhetoric to the investigation of scientific discourse renders rhetoric itself, what little is left of it, impotent, because that act stretches an already thin vocabulary to the point of transparency. He's wrong.

He's wrong in the trivial sense of simply missing a host of critical points. He ignores, for instance (and requires us to ignore) that what Daston (1991a) investigates as a "technology of trust and proximity" which gave

rise to objectivity in Early Modern scientific discourse was first investigated by Aristotle as *ethos*, in the *Rhetoric*, that what Holton (1988) charts under the term *themata* are recognizable under another label, *topoi*, that what everybody and his Uncle Ivor are talking about when they point at scientific discourse and say "metaphor" is, ahem, a rhetorical figure.

More specifically, confronting a powerful text whose immense repertoire of textual resources is driven by the need to deny suasion, confronting such a text and saying "lo, suasion" is a tremendously important move, one that, if it is noticed, believed, and taken seriously completely reframes that discourse and the claims of its community about how it functions. At least, it *was* a tremendously important move when it was taken, forty years ago, by Paul Feyerabend, Norbert Hanson, Michael Polanyi, John Ziman, and others--most famously, Thomas Kuhn. Equally important was the noticing, the believing, and the taking seriously of this observation by historians and sociologists of science, in a wealth of case studies, somewhat later by philosophers of science, especially as their work became (like that of historians and philosophers) more descriptive and less prescriptive in approach. Some very fine and compelling research has developed in the wake of the "lo, suasion" declaration associated mostly with Kuhn, research that charts the maneuverings of scientific interest groups. What has often been missing from this work, as Taylor puts it in a more local context "is an account of how those interests are advanced, defended, negotiated, evaluated, and closed down--a matter of rhetorical analysis" (1997, 76n10). When such an account is offered, it has usually been ad hoc and partial. Martin Rudwick's superb *Great Devonian controversy*, for instance, adopts an informal litigational framework, without the slightest awareness of the genealogy of the forensic theories constituting that framework. Steven Shapin's *Social history of truth* charts issues of credibility in Early Modern science with scattered recourse to phenomenological and ethnomethodological work, with only a dim awareness that Aristotle's *arete*, *eunoia*, and *phronesis* are the defining criteria for credibility (even his use of prudence comes refracted through Locke). Feyerabend's *Against method* simply peppers his analysis of Galileo's arguments with the word, *propaganda*. I have nothing but admiration for Rudwick, Shapin, Feyerabend, and Kuhn, but they all talk(ed) a great deal about suasion without drawing on the technical resources of rhetoric.

Gaonkar sneers at Prelli for 'translating' Kuhn into rhetorical terminology (1997a, 73), but Prelli, along with the other suspects Gaonkar indicts, is simply answering an invitation Kuhn extended (Kuhn 1971, 152; Harris 1997, xxviii), to move from "Lo, suasion" to "Lo, arrangement (e.g., Gross 1985), audience (e.g.,

Ceccarelli 1994), epideictic (e.g., Sullivan 1991), ethos (e.g., Halloran 1984), figuration (esp., Fahnestock 1999), forums (e.g., Lyne and Howe 1986), genre (e.g., Bazerman 1989), invention (e.g., Campbell 1970, 1975), kairos (Miller 1992), pathos (Waddell 1990), strategic agents (e.g., Moss 1984), style (e.g., Myers 1990), topoi (e.g., Prelli 1989a), and so on.

Again, however, Gaonkar's wrongness is much more fundamental than a failure to appreciate that rhetoric of science is a resource-rich beneficiary of the Kuhnian legacy. He doesn't recognize any hermeneutical province for rhetoric at all, a position that proved to be a stick in a hornets' nest. His attack on rhetoric of (anything but especially of) science received a huge amount of attention, dominating the nineties.¹³ All in all--ten years in the making, barrels of ink spilled by a phalanx of figures major and minor (and the spilling continues before your very eyes), billions and billions of neurons pulsed (and the pulsing continues behind your very eyes)--a mountain. But look under that towering heap of argumentation. You'll find a molehill. Gaonkar's position is very, very weak, and beyond the sheer audacity of asserting it so doggedly, there is very little to explain why so many people took it so seriously¹⁴

The fulcrum of his entire case is the barely fettered descriptive compass of Aristotelean principles. Since one cannot find discourses absolutely devoid of ethos, pathos, or logos, Gaonkar somehow presumes that these notions become vacuous (except in their productivist function, as aids to invention, 1997a 33). The position is stunningly wrong, though it has led to sufficient fretting about the strong programme that some further attention is required here.

The argument is familiar enough to have a label. It is known as *si omnia, nulla*; if everything, then nothing.¹⁵ It is aired regularly at conferences and in classrooms and journal articles and over the net, whenever rhetoric is directed more widely than a small subset of verbal activities which wear their suasions on their sleeves. Whenever, that is, rhetoric is treated as elemental to symbolic exchange rather than as a local practice of the glib and the oily, someone stands up and shouts "*Si omnia!*" and begins a panic-stricken drive for the exits. Here is one of the clearest and least hysterical articulations of the fear:

If we become too diffuse, if we overlap too many other areas, we risk losing our identity. If rhetoric tries to encompass everything, it becomes nothing: rhetoric as a field disappears (Porter 1993, 213).

Aristotle--whose definition (as a "faculty" not a "practice") clearly licenses this diffusion--had no such worries. His concerns ran in the opposite direction. At the productivist end of the street where Gaonkar wants us all to

dwelling, Aristotle told us, long before there was an us to tell, that the more specific an argument becomes, the more rhetoric (like dialectic) disappears into that argument (*Rhetoric*, 1358^a). The more fully one practices the discourse of biology (philosophy, architecture, ...), the more one becomes a biologist (philosopher, architect, ...).¹⁶

But criticism (rhetorical hermeneutics, if you like) escapes that problem. A rhetor may see himself as a biologist, not a rhetor, but nothing forecloses the critic from seeing a biologist as a rhetor, from noticing suasive tactics where participants see only matter. Aristotle himself, as discourse critic, fits exactly this profile. For instance, in trying to make the point that rhetoric and dialectic do not participate in expert discourse, he draws examples from a discussion of special *topoi* (one of the provinces shared by rhetoric and dialectic) and ends up saying virtually the opposite: there are special lines of argument for the natural sciences; there are special lines of argument for ethics; you can't mix them. Enthymemes, of course--i.e., "rhetorical syllogisms" (*Rhetoric* 1356^b)--are largely based upon special lines of argument. He sees rhetoric where physicists would see only physics (1358^a).¹⁷

Criticism, in short, saves rhetoric from one disappearing act, disappearance under the weight of specificity. Does it then doom rhetoric to another disappearing act, from being stretched into vapour by the pull of generality? No, except in those cases where *rhetoric* is already vaporous. An indiscriminate use of the word *rhetoric* plumps it into a pleonastic cypher--that's true enough--and there is no denying that much scholarship deploys it thusly, practiced by scholars who, as Gaonkar complains in another essay "simply scatter the word rhetoric carelessly through their texts" (1990, 353); regrettably, some are even rhetoricians¹⁸ But that is a general semantic issue, with no special relevance to our field: words can lose reference. *Atomic*, for instance, and some of its lexical relatives, lost virtually all of their reference in main-stream American English of the fifties, so that one could buy Nuclear Burgers and Hydrogen Fries in Atomic Cafes.¹⁹ Physics was unperturbed. Rhetorical theory could take a lesson. It could go about its business while the word *rhetoric* is drawn out to pellucidity by some users. Owners of atomic cafes were simply cashing in on the charisma of a vocabulary (which, it should be noted, got its charisma because others used it more precisely), not attempting to refer accurately. Scholars, one needs hardly mention, can be every bit as semantically unscrupulous and opportunistic as restaurateurs But this phenomenon is only obliquely related to a view of rhetoric which sees,

for example, the presence of ethos in every symbolic act, or the impossibility of nonfigurative language, or suasion in every discursive nook and argumentative cranny.²⁰

Once semantic slop is disregarded, it is clear: *si omnia nulla* is just flat-out silly. There is nothing in principle wrong with omnipresent phenomena. Nobody, inside or outside of physics, questions the utility of notions like weight and mass because they are definitional of matter, and therefore--to quote Gaonkar--demand the "promiscuous usage" of physicists, astronomers, engineers (1997a, 37). Nobody, inside or outside of biology, questions the utility of deoxyribonucleic acid because ubiquitous in organisms. Nobody, inside or outside of chemistry, ridicules molecules or atoms because you can't move without wading through them, shedding them, becoming them as they become you. Or, take other criticisms. Semiotics can look nowhere but it finds signs; are there, then, none? Feminist criticism sees everywhere the signs of a patriarchal hegemony; does this leave feminists nowhere? Deconstruction, a critical vocabulary Gaonkar bizarrely holds up as paradigmatically thick (without mentioning its Gorgianic tendrils; 1997a, 33; see Campbell 1997, 124-26), sees everywhere in discourse the seeds of *différance*; *nulla*?

The mistake that *si omnia* worry-warts make is to confuse "everywhere" with "exclusively". But semioticians can look at a budding tree, see an index of Spring, and leave it a budding tree still, with properties galore for botanists, biologists, chemists, and little boys with stuck kites, to talk about. Rhetoricians can investigate symbolic acts and leave plenty behind for linguists, information theorists, acoustical physicists, and little boys with freed kites, to talk about. Rhetoricians can even coöpt the results of linguistics, information theory, and acoustical physics, nor stop there, to talk about the suasive workings of symbolic acts, without in any way displacing or negating those fields, and without in any way rendering their own talk empty (though, of course, it might be).²¹ Capaciousness and empty reference are not the same thing, not even close. Rhetoric is a perspective on symbolic exchange, a way of seeing, a terministic screen (more properly, it is a collection of overlapping terministic screens, but little of consequence hangs on that distinction here); nothing more, nothing less.

It is not, in short, "everything is rhetoric" that defines the strong programme of rhetorical criticism, but "everything (symbolic) is rhetorical", which is much different, and in no way exclusionary. Nor does it imply that everything is *equally* rhetorical. The rhetorical quotient of "Push the F9 key" or "So much depends upon a red wheelbarrow" is (contingent on situation, of course) is considerably lower than the rhetorical quotient of

“Down with the President!” or “Yep, she’s got low mileage, the oil’s been changed regularly--only one owner, you, know, an elderly school teacher.”

Gaonkar is an instructive read, but not because of any peril he poses for rhetoric (of anything but especially) of science. He is instructive for the pressure he puts on a central, ancient, defining question of our discipline. As always, the antithetical answers to this question can be found in Aristotle. His fabled definition of rhetoric is "the faculty of observing in any given case the available means of persuasion" (*Rhetoric* 1355b 10-11); a definition whose kinship is with Gorgias, Protagoras, Isocrates, Cicero, Quintilian; a definition hinging on *ergon*, which Rhys Roberts famously renders *faculty*, George Kennedy as *ability*, but which can also map into *function* and *capacity*, among others likeminded words²²; a definition, that is, which stresses endowment and evokes cognition; a definition, further, which does not localize rhetoric to any specific discourse. That is not the end of Aristotle's story, of course: it is a definition which does not play out consistently in the *Rhetoric*. His treatment of this faculty is often highly particularized, to the judicial, the political, and the ceremonial realms. He examines it not in accord with his definition, as a faculty, but as a craft, an art, a *techné*.

The question we all have to answer, then: Is rhetoric an elemental presence in all discourse, or is it a localized set of principles for a few genres of public discourse? *Ergon*? Or *techné*? The more practical questions that follow from this one are: *Fish*? Or *cut bait*? If one wants to fish, rhetoric of science is inevitable.

If one wants to cut bait, one goes to see Plato. Gaonkar goes to see Plato. He begins his pinched little history of the discipline with "Gorgias may have imagined a rhetoric that would become the privileged site for a festival of language, ... But such a festival never did take place" (1997a 26), and we all know who rained on Gorgias's festival.²³ Plato's staggeringly successful intellectual programme is not only organized around a sustained, merciless, and utterly unprincipled attack on the sophists, the defining blows against rhetoric are struck in a dialogue named after Gorgias.²⁴ Not even a *techné*, Plato's Socrates lectures Plato's Gorgias in the dialogue, rhetoric is merely a *tribê*, a knack; worse yet, a *kolakeia*, a flattery, a bogus art, like cosmetology, which "is knavish, false, ignoble, illiberal, working deceitfully by the help of lines, and colours, and enamels, and garments, and making men affect a spurious beauty to the neglect of the true beauty which is given by gymnastic" (*Gorgias*, 465b). Here we have Gaonkar's rhetoric.²⁵

Knowing, rhetoric of science

To show that persuasion, when added to speech, also moulds the mind in the way it wishes, one should note first the speeches of astronomers, who substituting belief for belief, demolishing one and establishing another, make the incredible and obscure become clear to the eyes of belief.

--Gorgias of Leontini

And here we leave Gaonkar's rhetoric: a full-blooded rhetoric of science exorcises Plato because it stakes a claim on the two biggest fish he wants for his own pond, truth and knowledge.

Truth and knowledge in contemporary rhetoric of course starts with Scott. His 1967 paper set off a clambering is-to, is-not, dialectic; or, more properly, a polylogue-cum-trilectic, wherein assertions and denials and assertions clashed from three main positions: is-not; is-to, but only *this* much (fingers held at various lengths from each other, ranging from Zhao's weak version to his restricted strong version); and is-to, through and through (Zhao's non-restricted strong claim). The debate grew until the 1980s, when it became the dominant theme in rhetorical theory; twenty years after it was published, the essay was still being called "controversial" (Nelson, Megill, and McCloskey, 1987, 14). But the controversy proceeded somewhat hermetically, until the demise of the is-to positions was announced in a 1990 special number of the *Quarterly Journal of Speech*. Barry Brummett, a through-and-through is-toer, delivered the eulogy, lamenting its premature death by burn out.

He forgot to check the pulse, however; or, actually, the address. Epistemic rhetoric was not dead, not even a bit faint. It had just moved. As Alan Gross declared in an article entitled "Rhetoric of science *is* epistemic rhetoric" later that same year, the concerns had checked out of its largely abstract initial chambers and taken up rooms in rhetorical criticism, in the rhetorical criticism of the discourses permeating the epistemically most productive enterprise we have, science.²⁶ Not every rhetorical critic of science was as enthusiastic about epistemic matters as Gross--well, *no* other rhetorical critic of science was as enthusiastic as Gross about epistemic matters, at least in print--but it was virtually impossible to proceed orthogonally to the issue.²⁷ Although it is hard to document (not everyone issued policy statements), critical sympathies were congenial with strong epistemic claims. Else, most of us thought, what's the point? Why look at a knowledge engine--almost, in the late second millennium, *the* knowledge engine--if you don't care that it's producing knowledge? Indeed, even the work of epistemic agnostics, like Michael Halloran and the early Campbell, and

of the epistemically perplexed, like Jean Dietz Moss, and certainly of the attenuated-strong-claim theorists, like J. E. McGuire and Trevor Melia, is unavoidably enwrapped by these questions, a fish in a newspaper. The fish is any rhetorical analysis of scientific discourse. Here's the paper: If not for the phenomenal knowledge-building success of science, and for its unquestionably related prestige, why invest the critical energy in such dense, specialized, willfully discouraging discourse? One might somehow ignore the epistemic dimensions of scientific discourse and investigate it solely because it "is quite likely the most triumphant, the most imitated, the most universal form of human discourse ever developed" (Montgomery 1996, 2). But that is only shell-and-pea game (even if the critic perpetrates it on herself). What is the source of its triumph? Why is it so imitated? Why is it so wide spread? It makes knowledge.

By its very existence, that is, criticism in rhetoric of science "[runs in general support of] the theoretical position that [had] come to call rhetoric 'epistemic'" (Miller 1998, 103).

Epistemic rhetoric of science nests in a familiar snakebed of issues: constructivism (the world is a symbol-encoded illusion), relativism (my symbol-coded illusion is just as good/true/real as your symbol-coded illusion; so is everyone else's), indeterminacy of meaning (I can never be sure that you're 'getting' any propositional content even close to what I want you to 'get'; you can never be sure that you're 'getting' any propositional content even close to what I wanted you to 'get'; we can't even be sure that 'getting' obtains of symbol transmission). These are troubling issues all, which I will completely ignore (beyond my advocacy of the staggeringly obvious Claims 1, 2, and 3 which begin this essay). But, at the ground, the positions all implicate contingency, which I will not ignore.

Certainty has always been an Other to rhetoric. Some rhetoricians have openly doubted it--including, by reputation, Gorgias²⁸--while others have been content to cede it to philosophy, mathematics, logic, religion. But it has always belonged, if anywhere, elsewhere. Contingency, on the other hand--likelihood, probability--those are the guiding spirits of rhetoric.

Modern science has established that absolute certainty does not and cannot hold; therefore, that all truths are contingent. Most nominally, of course, there is Heisenberg's Uncertainty Principle, but Gödel's Incompleteness Theorem is even more conclusive here. Heisenberg's principle has the liability of being constrained to a sub-atomic realm, about as far removed from naked impingements as physically possible. Gödel's theorem, too, is beyond immediate (in fact, any) sense data. It is confined to a formal realm which, by

definition, is without sensual impingements. But that realm (1) is presumed to model grosser relationships, and (2) had been relentlessly bruted as the last refuge of certainty. Nope, sorry, not here either, says Gödel. The Incompleteness Theorem goes right after the very possibility of even formal certitude within a closed system, by demonstrating the untenability of the principle of non-contradiction; "no matter how perfect the language," Gödel shows, it is "impossible to prove that some A could never be found to be *non-A*" (Cyphert 1998, 82). Robert Wardy (1998) argues that Gorgias's epistemic project was to overthrow Parmenides's principle-of-noncontradiction grounding for certainty; if so, then Gödel supplies the mathematical proof for Gorgias's project.

OK, so take the Incompleteness Theorem. Add the theory of relativity. Add the development of many compelling and consistent, but competing, geometries, replacing the Euclidean monolith. Add the fact that yesteryear's established theories (that is, yesteryear's truths) inexorably become, mistakes²⁹. Add, if you like, the almost total secularization of science, the removal of a guaranteeing deity. Add up the last hundred-plus, immensely productive, years of science, and along with black holes, televisions, recombinant DNA, and microwave ovens, you get the Death of Certainty.³⁰

But there is an enigmatic irony at play with Gödel's argument: we believe it. Invoking the modern day progenitor of epistemic rhetoric, Dale Cyphert says

Robert Scott points out that Gödel answered the key question of epistemology, "how can one be certain?" with a simple answer, "one cannot" (Scott, "Epistemic Rhetoric" 302). Nevertheless, the mystery of Gödel's discourse is that we are certain of his results. (1998, 88)

Cyphert gets carried away at this point. He goes ontological. He says that Gödel has found Truth. But there's a more local answer to our cultural conviction that the Incompleteness Theorem is incontrovertibly right. Certainty is a psychological state, not an ontological condition. It would be insensible--blind, deaf, anosmic, tasteless, and tactless--to all the historical evidence to assume that in, say, 200 years, Gödel's theorem will be equally compelling.

There's also a rhetorical answer for our cultural conviction in the rightness of Gödel: it is the best argument we have on the question of mathematical (and, *a fortiori*, scientific) certainty. And that, effectively, is what the strong claim of the epistemic problematic for rhetoric of science amounts to:

- truth is a property of statements with respect to other statements (not to the out-there, nor even to the naked impingements)
- knowledge is a configuration of mutually supporting true statements
- configuring statements into networks of support for each other is a rhetorical function
- a first principle of rhetoric is that arguments are situational, responding to and provoking other clashing, collaborating, or calibrating arguments
- truth and knowledge are the survival of the fittest argument.

(This list casts a neoAristotelian light on the position, but a Gorgianic version is only a few syllables away: substitute *logos* for *argument*.) On what do such arguments rest, if not on the out-there or on naked impingements? On each other mostly, by way of networked credibility (ethos), mutual interests of the audience (pathos), and strongly constrained discourse patterns ((Aristotelian) logos), all in ways that evoke shared representations of the out-there and deploy claims about impingements.

Rhetoric of science, pointing at and explicating these suasive webs, has proven its own epistemic worth mostly by way of case studies; rhetoric is fundamentally an art of the particular. But rhetoric has also always recognized that it must look outward from the particular:

[An argument] is persuasive because there is somebody whom it persuades. But none of the arts theorize about individual cases. Medicine, for instance, does not theorize about what will help to cure Socrates or Callias, but only about what will help to cure any or all of a given class of patients: this alone is its business: individual cases are so infinitely various that no systematic knowledge of them is possible. In the same way the theory of rhetoric is concerned not with what seems probable to a given individual like Socrates or Hippias, but with what seems probable to men of a given type. (*Rhetoric* 1356^b)

If rhetoric of science is to grow significantly beyond the particular--if it is to develop to a point where the particularized studies do not just pile up, but stack up (Gross 1992)--it must seek consistent and revealing accounts for *why* science is rhetorical.

In part, this program is already underway; such accounts are the meat and potatoes of the epistemic line that guides so much rhetorical research into scientific discourse. But so far that line has largely been limited to pointing and explicating as well, not explaining. Explanations, such as they are, generally take the form 'we

argue, therefore we know'. The next step, the one less taken, is why argumentation leads to knowledge, what there is about an argument that makes it more likely to result in knowledge. We argue--we try to move and we allow ourselves to be moved--because we are social animals. These arguments result in knowledge (or not) because we need to know, or at least suspect, what is the case before we can act to our advantage, and to the advantage of our kin and confreres. As rhetoric has always noticed, some suasive devices are more successful than others; in William James's terms, they got this power from "our ancestors in their attempts to get the chaos of their crude individual experiences into a more shareable and manageable shape" (1984, 265). Their cognitive evolutionary success has made them

a part of the very structure of our mind. We cannot play fast and loose with them. No experience can upset them. On the contrary, they apperceive every experience and assign it to its place. To what effect? That we may the better foresee the course of our experiences, communicate with one another, and steer our lives by rule. Also that we may have a cleaner, clearer, more inclusive mental view. (1981, 265)

There are symbolic configurations that play better to the structure of our minds than others; rhetoric has traditionally labelled these configurations, figures.³¹

Science figures

Socrates: Then, poetry is a sort of rhetoric?

Callicles: True.

Socrates: And do not the poets in the theatres seem to you to be rhetoricians?

Callicles: Yes.

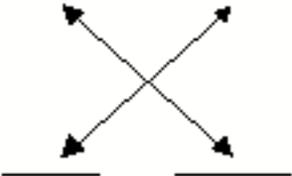
Socrates: Then now we have discovered a sort of rhetoric which is addressed to a crowd of men, women, and children, freemen and slaves. And this is not much to our taste, for we have described it as having the nature of flattery.

--Plato

The inventors of modern science had the same express fear and loathing of poetical language—of the linguistic machinery which came to be called figures and tropes--as Plato “Metaphors, and senseless and ambiguous words,” Hobbes, complained, must be banished because “reasoning upon them is wandering amongst innumerable absurdities” (117). And here is Spratt: the “trick of *Metaphors*”, the “specious Tropes and Figures”, the “abundance of Phrase” cloud knowledge in “mists and uncertainties” (112). But, again like Plato, they

proceeded to exploit figures avidly in their pursuit of knowledge. Lo, Newton, explaining his third law of motion in the *Principia*: "Si quies lapidem digito premit, premitture et hujus digitus a lapide" (*Philosophiae*, 16): "If you press a stone with your finger, the finger is also pressed by the stone" (*Mathematical*, 14).

This figure, antimetabole (\approx "turning about", Gk.; a.k.a., counterchange, commutatio, reversion; a.k.a., somewhat erroneously, chiasmus). is one of Gorgias's signatures, a frequently antithetical, backflippingly reciprocal, parallel-phrase flourish that was also a favorite of the late Theodore S. Geissl:

I meant what I said

I said what I meant . . .
 An elephant's faithful
 One hundred percent!
 (Seuss 1991, 110, *et passim*)

Now, if any device should find itself snubbed by a dogmatically just-the-facts medium like scientific discourse, it is this highly figurative figure. But Newton is not alone among scientists in this kinship to Dr. Seuss: "Not only have males evolved to compete for scarce female eggs", Robert Wright argues in his evolutionary psychology apologue, *The moral animal*, "females have evolved to compete for scarce male investment" (1994, 63). 'Yes, well, fine and good', pipes in Socrates or Spratt or Hobbes, 'good and fine, but Mr. Wright is not even a scientist, just a man on a soap-box. Of course he's going to tart up his case'. OK, I concede. Maybe Wright isn't an ideal case, since he doesn't pour substances from one beaker to another, or peer through a microscope, to make his living. But the scientists he writes about, evolutionary psychologists, have a generative antimetabole at the very heart of their enterprise, the poorly labeled theory of reciprocal altruism (it could be more accurately be called the theory of what's-in-it-for-meism), which boils down to "you scratch my back, and I'll scratch yours" (Trivers 1971).

Evolutionary psychologists not high enough in the scientific pecking order? Lo, Henry Gee, a card-carrying zoölogist, in his *Search for deep time*: "Cladistics is concerned with the pattern produced by the evolutionary

process; it is not concerned with the process that created the pattern" (1999, 151). 'That's not science, that's *about* science', counters our truculent interlocutor. OK, how about: "Just as there is no organism without an environment, there is no environment without an organism" (Lewontin 1995 131). 'Mr. Lewontin is known to be crafty, a little exuberant stylistically, a little glib; he's not at all your typical scientist'. Pasteur, then? --"La vie, c'est le germe et le germe, c'est la vie" (1922, 1.378). 'Hmm, ... well, ... he was, ... after all, ... *French*.' Will Euclid do? Propositions 47 and 48 of *Elements* look like this:

Proposition 47

In right-angled triangles the square on the side subtending the right angle is equal to the squares on the sides containing the right angle.

Proposition 48

If in a triangle the square on one of the sides be equal to the squares on the remaining two sides of the triangle, the angle contained by the remaining two sides of the triangle is right.

Or, how about the commutative principle in algebra? Every account of the principle in algebra has equations that look like these:

$$m + n = n + m$$

$$m \times n = n \times m$$

$$m - n \neq n - m$$

$$m \div n \neq n \div m \text{ (or, } m/n \neq n/m)^{32}$$

And commutation holds in symbolic logic, as well, of disjunction and conjunction:

$$(P \ \& \ Q) \Leftrightarrow (Q \ \& \ P) \text{ (Mates 1972, 105)}$$

$$(P \ \vee \ Q) \Leftrightarrow (Q \ \vee \ P) \text{ (Mates 1972, 103)}$$

'Alright, alright', our adversary might now grant, 'perhaps there is some inexorable pull of the audience, some need to sell that accompanies an intellectual commitment to the truth, which leads even the astringently scientific Newton, the austere mathematical Euclid, into concessions of the rhetorical kind. But, surely, you're not proposing there is something about such a gaudy, hot-dog figure *essential* to the pure and arcane workings of science?'

I am: Lo, Faraday, in his journal--in the absence of audience, with nothing to sell, and no customers in any case--recording his observations of an experiment on the relationship between magnetism and electricity in which a magnetized needle was suspended close to a wire conducting electricity: "Hence the wire moves in

opposite circles round each pole and/or the poles move in opposite circles around the wire." (quoted in Fahnestock 1999, 144). Here, in the private cogitations of a plain-speaking Scottish scientist, the conclusion becomes unmistakable: this criss-crossing, loop-de-loop, Gorgianic--nay, Seussian--figure, is part of the nuts and bolts of scientific invention. Jeanne Fahnestock, from whose wonderful new book many of these examples of antimetabole have been shamelessly poached³³, sums it up beautifully, if tentatively:

According to Faraday scholar David Gooding, when Faraday wrote this figured claim it was half established observation and half a prediction he had yet to observe (Gooding 1985, 118). Why he would have conceptualized the movement of the displaced needle as circular seems easily understood on the basis of previous discoveries he knew about, but why he would have reconceived the circular movement of the needle around the wire as the movement of the wire around the needle seems an inexplicable leap of genius, the kind of insight usually explained by the inspiration of a metaphor. Gooding also suggests pragmatically that, "This transformation--imagining that it is the *wire* which describes the circle instead of the needle" probably solved the problem of reducing a sequence of positions into a single spatial arrangement and three dimensions into two (118). However, Faraday's recourse to the figural logic of the antimetabole, forming the prediction from the observation by allowing the first colon to write the second, is another possible explanation (145).

This tempered suggestion of a rhetorically strategic invention, Fahnestock follows up with something of a scramble to account for just how Faraday might have come across enough salient antimetaboles to let them seep into his private jottings and allow one to lead him into prediction. Offering first that "figures of speech like the antimetabole are actually common enough in usage so that no exposure to rhetoric is necessary to explain their appearance [in Faraday]", Fahnestock nevertheless tries to establish an explicit link through his "life-long affiliation with the Sandemanians", a Protestant sect which believed in intensive study of the bible, where he would have encountered and formed a "deeper appreciation" of figuration generally, antimetabole specifically. (1999, 146)

Maybe.

The Bible is certainly rife with antimetabole--not just in the (post-rhetoric-as-a-discipline) Greek New Testament, but in the Hebrew Old Testament (like this nifty little triple back flip: "Whoever sheds the blood of man by man shall his blood be shed", Genesis 9:6)--and it's admirable of Fahnestock that she works so hard to establish discursive causation for Faraday (and very typical of her caution about the cognitive implications of her research) that she feels compelled to do so. But there are simpler explanations than biblical imitation, and explanation with ample support from linguistics and cognitive science: crossed reference is one of the grooves

our language and thought run along. Fahnestock comes part way toward that answer by glancing in the direction of general cultural transmission; if nowhere else, Faraday would have found a central antimetabole in Newton.

But Newton and the Sandemanians are unnecessary. Antimetabole is rampant. It's contagious. It's seductive, beguiling, irresistible. One expects this sort of rhetorical grandstanding from the sophist who gave figuration a bad name, Gorgias ("It is an equal error and ignorance to blame the praiseworthy and to praise the blameworthy", *Encomium* 1), but from the philosopher who gave Gorgias a bad name? Yet, here is Socrates: "Bad men live that they may eat and drink, whereas good men eat and drink that they may live" (Laertius, *Lives*, II.xvi). One expects these verbal hijinx from Dr. Seuss--he even has visual antimetaboles (1960, 28-29)--but from that contra-ornamentation, set-jawed champion of the plain-style-squared, Ernest Hemingway? Yep. Here is Pablo, in *For whom the bell tolls*, and, more importantly Anselmo, pulled irresistibly by what Fahnestock calls figural logic, into his cutting response:

"You treat a man as coward because he has a tactical sense. Because he can see the results of an idiocy in advance. It is not cowardly to know what is foolish."

"Neither is it foolish to know what is cowardly," said Anselmo, unable to resist making the phrase. (1968, 54)³⁴

Here, too, is Kant, the philosopher who gave philosophical prose a bad name, crossing himself while condemning rhetoric:

Rhetoric is the art of transacting a serious business of the understanding as if it were a free play of the imagination; poetry that of conducting a free play of the imagination as if it were a serious business of the understanding.

Both Marxes gets into the act:

It is not consciousness that determines life, but life that determines consciousness (Karl, in Reboul 1989, 173).

Money will not make you happy, and happy will not make you money. (Groucho, ATTRITION)

The case for cultural transmission is overwhelming. Ordinary language has no shortage of them, not just in the hoard of common sayings, from the hum-drum ("a place for everything and everything in its place") to the profound ("do unto others as you would have others do unto you") to the aversive ("don't call me; I'll call

you"), but also in spontaneous everyday routine exchanges. Here is an excerpt from a chat about the weather between a five-year old boy and your Intrepid Researcher:

Boy: [Looking out the window] Now there's more rain and less wind.

IR: Hmm, ... yes, there is.

Boy: But it used to be the other way around, a few minutes ago.

IR: [benign neglect]

Boy: There used to be more wind and less rain.

Other examples from the Annals of the Mundane include:

- When the same boy complained that his one-year-old sister was gnawing on the scabbard of his toy sword, your Intrepid Researcher, not thinking of the heights of Asianism, nor form in the least (Scout's honour), came out with, "That's okay. She won't hurt it, and it won't hurt her".
- The boy to a friend, on the properties of certain pennies: "Only the shiny ones are lucky". The friend, in reply, "Ya, and the lucky ones are shiny".
- A sports page during the 2000 Stanley cup playoffs, in which two players attempt to assign guilt over a game-winning goal: "Daniel Alfredsson blamed Cory Cross. Cory Cross blamed Daniel Alfredsson". (Zeisburger 2000).
- Dr. Joy Brown (a therapy talk show host): "You have to say to him 'It's as hard for me to give up everything that's dear to me, for you, as it is for you to give up everything that's dear to you, for me'" (*Dr. Joy Brown*, 1 August 2000)

Even Fahnestock cites an ordinary language example, from a newspaper article on a serial killer who turned himself in because "I would rather have my body locked up and my mind free, than ... my mind locked up and my body free" (1999, 25). Miles Davis, whose eloquence in English was inversely proportional to his eloquence in Horn, was fond of "Play and pray. Pray and play" (Santana). Here's one from the ordinary-language stock of science (and of criminology, which shares much methodology with science), a saying common in every lab and every class-room: "Absence of evidence is not evidence of absence". Heck, I've even

got one from Bart Simpson: "Church - Cult. Cult - Church" (it continues "so we get bored someplace else every Sunday" --SwO).

Indeed, the figure is so common, so natural, so insistent, that there is a well established genre of nudge-nudge-wink-wink-fill-in-the-antimetabolic-blank wise cracks--jokes whose punchline depends on the hearer's ability to hold a mirror effortlessly up to the phrase and complete the form. The specimen from this genre long favoured by your Intrepid Researcher is Dorothy Parker's response (all the nicer for the touch of polyptoton) to *New Yorker* editor Malcolm Ross when he wanted to know why she hadn't been around lately:

Too fucking busy, and vice versa. (Pinker 1994, 175)

But a more famous one is Mae West's

A hard man is good to find. (Grothe 1999, 113)

On its own, the remark is a flatly smutty assertion, but the antimetabolic play it makes upon the proverbial expression transforms it into a joke, or at least a witticism. Apparently, there are G-rated examples as well:

Time's fun when you're having flies (Kermit the Frog; Grothe 1999, 117)

A race track is a place where windows clean people (Danny Thomas; Grothe 1999, 118)

These last few (tacit) antimetaboles are from a book entitled *Never let a fool kiss you or a kiss fool you* (Grothe 1999), a book of antimetabole-driven quotations by a man on a mission to give the figure its due (he opts for the term *chiasmus*, however; examples like these, where the reciprocal phrase is only smirked at, not uttered, he terms *implied chiasmus*). He has a million of 'em.

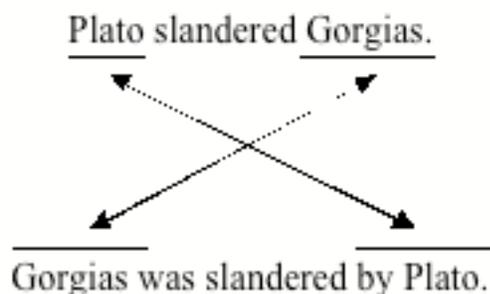
In Hemingway, and in Seuss, character is driving the antimetabole (though both of them are delivering morals as well); in Socrates and Kant and Marx, argument is more clearly in the driver's seat; Gorgias, as always, is tougher to pin down. The five-year old boy, and me, and the sports writer, and the student, and the serial killer, and the trumpet player, and Bart Simpson, all have somewhat different purposes, variously argumentative and aesthetic. But none of that matters much to the overall lesson: from there to here, from here to there, antimetabole is everywhere.

Language is so infested with the figure that cultural transmission proves to be more of a way-station than an explanation. Transmission this inexorable must itself have an explanation. It's memetic (Dawkins 1976, 206). Genes propagate because the medium--the ecological environment--sustains them. Memes propagate

because the medium--the cognitive environment--sustains them. Our minds, in sum, like crossed reference. Hence, antemetabole fructifies rather easily, and often crops up spontaneously.

Perhaps most tellingly of all, antemetabole is a regular feature of oral poetry. The figures of oral poetry--iambic rhythm, rhyme, and alliteration are among the best known--serve to support memory, to make the bard's job easier. The last figures one should find there would be cognitively expensive ones; cognitively natural figures, the first. Specifically of antimetabolic patterning, David Buchan says it "is intrinsic to oral creation because of the basic, structural mnemonic function" (1972, 100). Buchan was writing about folk tales, but it's equally common in folk music. "I *gotta* love somebody," Muddy Waters sang, "I gotta *love* somebody. I gotta love *somebody*." Then, bringing in the necessary reciprocity, he rounds off the chorus with "Somebody's gonna love me".³⁵ Nor, I think, is it an accident that children's literature is a common port of call for antimetabole.

There is more evidence for the cognitive naturalness position than brute infestation. We humans (perhaps we bicameral organisms) have a very widespread affection for inversion, which antimetabole exploits. Every known language on earth, for instance, has passive constructions (or their ergative cousins, called anti-passives), in which there is a swap of grammatical roles from the active variant that looks very antimetabolesque in juxtaposition:



English (along with a great many languages) accomplishes this swap most explicitly in terms of word order (abetted by some minor morphological noodling). Other languages use morphology more directly. But the mirror imaging of syntactic roles is the same. Languages frequently make use of these sorts of inversions to signal other functions as well; English, for instance, uses a subject-auxiliary inversion for most questions--yes/no questions (ii) and constituent questions (iii), in which the inversion is tacit against the standard

declarative order (i); echo questions (iv), in which the antimetabole is realized explicitly, with a pronoun recalling the subject; and tag questions (v), in which antithesis is thrown into the bargain.

- i. Stephen Hawking might know if there is an out-there out there.
- ii. Might Stephen Hawking know if there is an out-there out there?
- iii. What might Stephen Hawking know?
- iv. Stephen Hawking might know if there is an out-there out there, might he?
- v. Stephen Hawking might know if there is an out-there out there, mightn't he?

Reciprocal anaphors are also available in all languages, which imply antimetabolesque conceptual relationships. The proposition "Socrates and Callicles slandered each other", for instance, entails the two propositions:

- vi. Socrates slandered Callicles .
- vii. Callicles slandered Socrates .

And, of course, we have such common expressions as *vice versa*--a stenographic trick for summarizing antimetaboles--and handy adverbs like *conversely*, which trigger antimetabolic reversals in the hearers.

It is a short move to go from features which define human languages at the syntactic level,³⁶ and thus reflect something universal about brain wiring, to an account of the presence and power of configurations at the discourse level. Nor is this reciprocal spirit we have confined just to language. Our visual productions are rife with it as well, not just in Dr. Seuss, or other elaborately playful artists (like M.C. Escher), but in such ubiquitous images as the swastika, the ying/yang, the moebius strip, and the Pepsi logo; the name for a sexual practice of simultaneous mutual oral stimulation depends on the iconic significance of the (vertically) antimetabolic numerals, 69. Meanwhile, back in science, Faraday's notebooks are full of antimetabolic sketches, and his published arguments contained antimetabolic diagrams (Fahnestock 1999, 145 - 147).

None of this should be especially surprising, however, when we consider the well established cognitive principles abetting antimetabole. The figure involves repetition and symmetry--the first a *sine qua non* of thought, and, in George Kennedy's terms a kind of primordial rhetorical energy (1998, 4); the second a characteristic our minds adore--and it very frequently commingles with antithesis, for which our heads also have a great affinity (in fact, antimetabole seems to be a syntactic antithesis; antithesis a semantic

antimetabole). Indeed, given what we know about the mind, it would be weird in the extreme if antimetabole were not legion. And, given what the philosophy of science and evolutionary psychology have both found about the close connection between truth and aesthetics--of which James Watson's "the structure was too pretty not to be true" (1968, 134) should be the slogan--the presence of such a comely figure in scientific reasoning should not be a surprise. (Watson, of course, was talking of the antimetabolesque double helix.)

Framed in these terms, the natural history of antimetabole belongs to the study of human cognition, not to personal biography (Faraday's or anyone else's), and is consequently far more interesting, and far more sweeping in its extensions. It is, at the moment an open empirical question how widely distributed antimetabole is, especially in the oral traditions of non-Western languages, but it is an important question. If it is a cherry-on-top flourish that needs to be learned, one would expect to find relatively few examples the further one got from the influence of the literate West. If it is a natural reflex of the spirit of inverse symmetry, one would expect to find such examples as this, from 4th C BCE China:

She who knows does not speak.
She who speaks does not know. (Lao Tse, 56)³⁷

Jeanne Fahnestock (1999) establishes very solidly that antimetabole helps us to understand and to know (focussing her efforts on the discourses of science), not stopping there. She does the same for antithesis, incrementum, gradatio, ploche, and polyptoton. It is a remarkable, inspiring, *tour de force*. She does not, however, make the case that metaphor helps us to understand and to know. But, of course, that is not a case that needs making; no one would dispute any longer that metaphor is the verbal realization of a deep and powerful cognitive resource, the "omnipresent principle" of language, in I. A. Richards's phrasing (1936, 90). Nor does she offer a case for either metonymy or its stable mate, synecdoche. But the metonymy/synecdoche complex is as powerful and as widely distributed a conceptual tool as metaphor.³⁸ In Michael Billig's terms, "human thinking is fundamentally metonymic" (1987, 261-2). He means this in the Burkean sense of reductionism ("metonymy is the tropic expression of particularization", he says--1987, 261). But linguists have beaten the cognitive bushes pretty thoroughly over the last few decades, finding its lexical fingers in every pie.³⁹ As their data shows, representing a welter of concepts by one item that participates in that welter is a fundamental part of the cognitive substrate is,--as omnipresent as metaphor in ordinary language, and just as tangled up in understanding and knowing. Given the contempt with which she seems to hold metaphor

research (1999, 4 - 6), Fahnestock may have just avoided metonymy and synecdoche under the guilt-by-association topos. But certainly the case would not be difficult to make. Even calling some organism an *mammal*, for instance, or a *reptile*, is labelling it by one of its properties (respectively, possession of milk-secreting glands, and locomotion by creeping or crawling; in the former case, the property is only instantiated in half of the animals in the class, the females).

Many rhetoricians, too, would probably be content to let Burke's remaining master trope, irony, into the epistemic corral without much fuss. As for its role specifically in science, Wayne Booth puts it this way: "*der Geist der stets verneint* would be a good assistant to have in any laboratory" (1974a, 275).⁴⁰ And indeed, irony--considered as the spirit of negation--is a governing genius of science, in the lab, in the hallways, in the journals, hither, thither, and yon: the chief reason that science is so successful epistemically is that the spirit of negation, not to mention hostile negators with rival interests, is peering over the shoulder of all scientific rhetors, forcing them to build their arguments more and more robustly. Karl Popper raised the spirit of negation to a demarcation principle, falsificationism (1959, 41), but it is at work at work, "daily and hourly", like Darwin's Natural Selection, "scrutinising, throughout the world, ... rejecting those [arguments and strategies] that are bad, preserving and adding up all that are good; silently and insensibly working, whenever and wherever opportunity" (Darwin 1967, 84). --OK, not so silently and insensibly all the time, but the spirit of negation is the most powerful force in strengthening scientific argument.⁴¹ Burke activates this process when he calls dialectic the literal application of irony (1945, 511ff). And irony--the trope that Aristotle calls "the manner of Gorgias", *Rhetoric* 1408b)--has deep cognitive roots. Billig, again: "The ability to negate is a universal property of human language and is a feature which distinguishes human language from systems of animal communication. ... Human beings do more than merely categorize the stimulus world. Alone among the animal world, we can reflexively examine and dispute such categorizations. And for this the ability to negate is crucial" (1987, 125).⁴²

About the whole package of master tropes, remember, Burke says they "have a fundamental role in the discovery of the truth" (1945, 503), and Fahnestock (1999) establishes the same for her collection of figures. That's eleven, if you're counting. Let's make it an even dozen; this time, I'll poach from philosopher of mind, Daniel Dennet.

Here is Dennet's "intentional stance", for behaviour prediction: "First, you decide to treat the object whose behavior is to be predicted as a rational agent; then you figure out what beliefs that agent ought to have, given it's place in the world and its purpose. Then you figure out what desires it ought to have, on the same considerations, and finally you predict that this rational agent will further its goals in light of its beliefs." (1997, 61)⁴³ Here is some of his warranting:

It works with people almost all the time. ... Our use of the intentional strategy is so habitual and effortless that the role it plays in shaping our expectations about people is easily overlooked. The strategy also works on most other mammals most of the time. For instance, you can use it to design better traps to catch those mammals, by reasoning about what the creature knows or believes about various things, what it prefers, what it wants to avoid. The strategy works on birds, and on fish, and on reptiles, and on insects and spiders, and even on such lowly and unenterprising creatures as clams (once a clam believes there is danger about, it will not relax its grip on its closed shell until it is convinced that the danger has passed). It also works on some artifacts: the chess-playing computer will not take your knight because it knows that there is a line of ensuing play that would lead to losing its rook, and it does not want that to happen. More modestly, the thermostat will turn off the boiler as soon as it comes to believe the room has reached the desired temperature.

The strategy even works for plants. In a locale with late spring storms, you should plant apple varieties that are particularly *cautious* about *concluding* that it is spring--which is when they *want* to blossom, of course. It even works for such inanimate and apparently undesigned phenomena as lightning. An electrician once explained to me how he worked out how to protect my underground water pump from lightning damage: lightning, he said, always wants to find the best way to ground, but sometimes it gets tricked into taking the second-best paths. You can protect the pump by making another, better path more *obvious* to the lightning. (1997, 65; Dennett's italics)

The exercise of this strategy is often a case of "epistemic frailty" (for instance, with thermostats and computers--1997, 67); Dennett is principally concerned with "true believers" (about whom, by the way, he says antimetabolically that they "mainly believe truths"--1997, 63), in the hopes of making some philosophical progress with respect to machine intelligence. But its phenomenal success in understanding and knowing the world around us is compelling for rhetorical theory generally, theories of figuration particularly, when one word is invoked, personification.

Personification--you can see this one coming, I know, but it's the last one, for now--is endemic to science. I don't mean grand personification here, of the natural-selection-is-daily-and-hourly-scrutinizing, Darwinian sort, although such personifications have played substantial roles in the history of scientific discourse. But, rather, the hourly and daily personification into fictional characters that Halloran calls *abstract rhetors* (1997, 43).

Scientific discourse is ruled by locutions like

- viii these data argue . . .
- ix this result shows . . .
- x this paper demonstrates . . .
- xi this argument suggests . . .

Such personifications are so rife in scientific discourse as to be definitive. They are central mechanisms of the empiricist repertoire (Gilbert and Mulkay, 1984); building facts linguistically is a matter of making them "appear stable, neutral, and separate from the speaker" (Potter 1996, 69), and the tool box for such stabilizing, neutralizing, separatist representations prominently includes abstract rhetors; Perlman and Olbrecht-Tyteca call this method, with respect to personification, "the technique of severance", whose job is to make some essence "stable, concrete, and present" (1969, 331). Gilbert and Mulkay say that this technique enforces data primacy, which is true of viii and ix. But, as Halloran points out, its effect (in all four examples) is also erasure: "to suppress human agency, to imply that what are essentially rhetorical acts--arguing, showing, demonstrating, suggesting--can be accomplished without human volition" (1997, 43). It's a peculiar--ironic--practice, personifying abstractions to eliminate the presence of real persons. But it is an extraordinarily effective one.

Figures work.

Conclusion: Rhetoric, knowing

Come now, you must hear what I say and remember it, as I tell you of the only ways of inquiry that can be thought of. One, according to which there is [that which is] and it is impossible for it not to be, is the way of Peitho [Persuasion], for it follows Truth; and one is that according to which it is not and there is necessity for it not to be; and this I tell you is a way which is utterly obscure.

--Parmenides

Returning to Claim 3, a truth as solid as anything science has generated, we communicate.

Why?

We communicate because we are social animals. We share resources, which in and of itself requires that we communicate about those resources. But we have one particular resource that we share more incessantly than any other, information. Information, however, does not make itself, which gives us the last fundamental truth I want to advance here:

4. We invent.

We invent information in our encounters with the out-there, in our dealings with its impingements on our particular in-heres. We invent information in our cogitations about those impingements, in our negotiations about those impingements with other humans, in our negotiations with other humans about their impingements, in our negotiations with other humans about (impingements about) third-party impingements, in negotiations with other humans about their negotiations with other humans, and about (impingements about) third-party negotiations between other humans. And so on. And so on. And so on.

In all of these events--from stubbing one's toe against a rock ("stubbing" "one's toe" "against" "a rock") to reading commentaries on commentaries on commentaries on Aristotle--language is immeasurably fundamental (our cogitations, while not coextensive with language, profoundly implicate language; the same is true, *a fortiori*, for our communications, and, yet stronger, for our inventions). And the linguistic molecular structures known as figures are immeasurably fundamental to language.

Figures are the very stuff of language, the bones and muscles, nerves and skin, blood and guts. They are the very antithesis of, in Plato's famous assault, "colours, and enamels, and garments" (*Gorgias* 465^c) daubed on, and painted on, and draped over an otherwise pallid, virtuous, naked language.⁴⁴ Figures are the stuff of language. Language is profoundly cognitive. Throw *modus ponens* into the breach and you've got: figuration is cognitive. This conclusion is not at all novel, of course, if one localizes it to the few glamorous tropes. But *antimetabole*? *Personification*? *Polyptoton*? Oh, sorry. No evidence yet for polyptoton⁴⁵ as fundamental for understanding and knowing? Here's Fahnestock, with a principle and a representative practice:

Polyptotonic practices have been codified to form systems of nomenclature that encode the fundamental principles of [some sciences]. (1999, 172)

In no discipline is the importance of patterned nomenclature more obvious than in organic chemistry, where entry-level competence involves gaining control of the derivational system, the licensed polyptotonic moves. Students learn, for example, that hydrocarbons are divided into three subgroups, alkanes, alkenes, and alkynes, according to whether the bonds between the carbon atoms are single, double, or triple. These endings are then conserved in the naming of particular compounds, such as ethane, ethene, and ethyne. (1999, 173)

Let me be clear: I'm not arguing that every linguistic configuration which anyone has ever called a figure (or a trope, or a scheme), is (1) cognitively rooted and (2) deeply invested in understanding and knowing. Litotes (understatement), for instance, seems to operate pretty close to the surface, and may or may not be especially

resonant for a given community at a given time. It is a device which might be put to work denying agency, and the demotion of agency is an important element in the establishment of facticity. It might even team up with irony to simultaneously promote and demote agency, as Halloran (1997, 43) and Gross (1990, 62) both note of Watson and Crick's "A structure for deoxyribose nucleic acid". They find litotes instrumental in the assertion priority. It cloaks that assertion in a foot-shuffling ethos of humility, while irony brings it out with an elbow-in-the-ribs ethos of grinning arrogance. But litotes does not seem to participate in the reasoning very deeply, not as deeply as metaphor often does, for instance, or antithesis, or personification, or antimetabole. Which figures run deep, which ones don't; which ones are universal, which particular, which occupy the terrain between; these are empirical questions.

Nor am I arguing that figuration qua figuration makes truth. Plato was right. Figuration is flattery. It flatters our sensibilities. It plays to our cognitive receptors. It gives us what we want. But one of the things we want, perhaps the one thing we want most of all, is truth—solid, bankable information. We want ways to know and predict and decide; we are, after all, homo *sapiens*. If we didn't want truth, we wouldn't be here. If our antecedents were homo *insapiens*, man-the-unwise, not caring what inferences might follow from fresh sabertooth scat in the cave, or what season to return to the blueberry patch, or what that come-hither look connoted, neither of us would exist to meet up in this essay. The line would have gone dead. All organisms want truth. We're just the organism that wants a lot of it in symbols.

Symbols come in packages, some more useful than others; if you look at the sayings, proverbs, catch phrases, and slogans of everyday knowledge--the molecules of doxa--you find all of them, part and parcel, tightly and memorably figured. Which finally brings us--thank you for your patience--to what I *am* arguing: figuration, because it satisfies a collection of significant cognitive needs (aesthetic needs, activation needs, mnemonic needs) packages symbols into linguistic structures that lend themselves more easily to belief, and there is no knowledge that does not rest upon belief; figures make the matter *seem* true. Whether the matter comes to be believed is a consequence of how it fits into the auditor's prior beliefs, desires, interests. Whether it subsequently *proves* true is a consequence of how it fits into the logical space that defines and calibrates and associates our human and cultural reasons for warranting a belief into a truth. Fahnestock develops the notion of figural logic to this end, the idea that figures manifest, in especially compelling ways, lines of argument. We're all familiar with the metaphor-as-condensed-analogy commonplace. Fahnestock reminds us how

antithesis is characterized by Aristotle very much as he characterizes the topos of opposites (1999, 51-53), and how incrementum and gradatio align with the topos of greater and lesser degrees (1999, 93-98), polyptoton with the topos of grammatical forms (1999, 170), antimetabole with the topos of reversal (1999, 131-133). The metonymy/synecdoche complex clearly condenses the topoi of parts-to-whole and cause-to-effect, and their inverses. Irony recalls the topos of contradiction. As for the argumentative functions of ploche (the most repetitive repetitio), ever argue with three-year-old kids? They exponentially apply Empedokles's advice: "it is right to say what is excellent twice or even thrice" (Nahm 1934, 118). Figures, in short, crystallize styles of reasoning.

Styles of reasoning--the most powerful of them, in any case--are effective methods of symbolic inducement because they appeal to the structure of our minds. Burke (in a passage Fahnestock incorporates--1999, 34) gives a nice account of how this can work, how a figure can lead an audience along like a melody:

many purely formal patterns can readily awaken an attitude of collaborative expectancy in us. For instance, imagine a passage built about a set of oppositions ("we do this, but they on the other hand do that; we stay here; but they go there; we look up, but they look down," etc.) Once you grasp the trend of the form, it invites participation regardless of the subject matter. Formally, you will find yourself swinging along with the succession of antitheses, even though you may not agree with the proposition that is being presented in this form. Or it may even be an opponent's proposition which you resent--yet for the duration of the statement itself you might "help him out" to the extent of yielding to the formal development, surrendering to its symmetry as such. Of course, the more violent your original resistance to the proposition, the weaker will be your degree of "surrender" by "collaborating" with the form. But in cases where a decision is still to be reached, a yielding to the form prepares for assent to the matter identified with it. Thus, you are drawn to the form, not in your capacity as a partisan, but because of some "universal" appeal in it. And this attitude of assent may then be transferred to the matter which happens to be associated with the form. (Burke 1950, 58)

Burke says much the same of gradatio, a bit later in the argument, and we've seen Hemingway's Anselmo following the Burkean imperative for antimetabole in his swipe at Pablo-- it's figures in general that I'm concerned with, and many of them have this compelling character. But it is worth pausing at antithesis long enough to note that this is where we came in. Antithesis was one of Gorgias's signatures, inherited from Empedokles, and the defining strategy of Protagoras, and a cornerstone of the 5th century experimental efforts in creating a new form of discourse to investigate the impingements of reality while subordinating mythology and super-human agents; efforts visible also in the vestiges left to us by Anaxagoras, Heraclitus, Democritus,

and Parmenides (Kennedy 1994, 18)--and visible too in the (highly figured) investigations of Plato, many of which condemn figures and figurers.

Plato denied, or perhaps just worried about--depending on whether you attend to his practices or his policy statements--the elemental nature of rhetoric. His children are with us still, not just the hysterics like Gaonkar, but widely influential and generally reasonable scholars like Edwin Black⁴⁶. "The discipline of rhetoric predicates rhetorical activity as a product of volition rather than instinct," he says. "If rhetorical activity were instinctive, spontaneous, uncrafted and uncontrived, then the discipline of rhetoric would lose whatever identity it has sustained for two thousand years and would become a branch of biology" (1997, 25). No. Exploring the instinctive roots of rhetoric does not preclude exploring its higher design features as well; it is not a replacement of traditional rhetoric, but an augmentation of it. Cognitive rhetoric--a perissologia, redundant--is not in any way a denial of design. Witness the work of Mark Turner, who uses that label to identify his approach to literary texts, an application of cognitive science to "the study of English so that it comes to be seen as inseparable from the discovery of mind, participating and even leading the way in that discovery, gaining new analytic instruments for its traditional work and developing new concepts of its role" (1991, vii; see also 148-152).⁴⁷

We are, in Burke's dictum, a "symbol-using, symbol-making, and symbol-misusing" species (1968, 6), in Booth's elaboration, "a self-making-and-remaking, symbol manipulating creature, an exchanger of information, a persuader and manipulator, an inquirer" (1974b, 136). This symbolic disposition, this faculty, this ability, this function, this capacity--this *ergon*--did not show up yesterday, nor two-and-a-half millennia ago, in Sicily or in Athens. It is from a heritage much older than that, a heritage written in nucleic acids, not in Greek. It is in our biology, in our brains. It roots our suasions and our inquiries. It gives us truth (and error), science (and superstition), knowledge (and confusion). It emanates rhetoric.

Notes

*I would like to thank Barry Brummett, Bruce Dadey, Dave De Vidi, Becky Dipasquale, Mardy Grothe, Di Kilpert, Yameng Lui, Jan Narveson, Joseph Petraglia, Larry Prelli, Josh Silverstein, Christopher Starr, Paul Thagard, Mark Turner, Haixia Wang, Jim Williams, and Heping Zhao for discussions and clarifications

concerning various bits and pieces of this paper. Portions of my argument have appeared in *Rhetoric society quarterly*.

¹ I am agnostic about whether Sextus or the Peripatetic MXG collection represents the 'real' Gorgias on this matter, and am equally unconcerned with whether or not it is possible to triangulate the realest Gorgias by calibrating those two paraphrases against each other. I care only to foreground these propositions in connection to a few other ideas that have clustered historically around the name, *Gorgias*.

² I don't mean to suggest that hasn't been a fair amount of thought, talk, and ink devoted to questions of existence, which perhaps indicates some mild anxiety about the possibility of being. One need only think of the commentary encrusting Kant's noumenal world, his realm of *ding an sich*, to see that Claim 1 partakes of a recurrent intellectual theme. But virtually all of that attention endorses or assumes *ding im sich*. Similarly, there has been even more thought, talk, and ink devoted to Kant's phenomenal world, his realm of perceptions and categories (which implicates Claim 2), but again, the concerns are overwhelmingly with the reliability of our perceptions, the categories they fit into, and the factors that shape both perceptions and categories (God, language, culture, cognition), not with the very existence of primitive perceptions.

³ J. Poulakos regards playfulness as one of the a defining characteristics of sophistic rhetoric, and Gorgias as its chief exponent, citing his "discourses on Helen, Palamedes, and nonbeing" (1993, 58; also, 68-69).

⁴ The title may not be Gorgias's, of course, but that only defers the roller-coaster declaration slightly. As Wardy puts it, "even if [the title] is not original, it remains of interest, since it would then so clearly betray the difficulty later readers experienced" (1996, 15).

⁵ The recurrent question of how philosophically 'serious' *On nature* is not an especially urgent one. But I will pause to note that representative arguments on the two sides just point the beam of the same searchlight in slightly different directions. Dodd, for instance, on the nay side, takes time out of his commentary on Plato's *Gorgias* to sneer at any philosophical reading of *On Nature*; dismissing it as a knee-slapper served up by someone of "dazzling insincerity" (Plato 1959, 8). None of it can be taken seriously. But on the yea side the only difference is that--however serious the *argument* might be, *Gorgias* isn't, at least insofar as endorsing

Claims α and β is concerned. Guthrie, who is most responsible for the view that *On Nature* is a powerful, philosophically respectable, argument, regards these two propositions and their surrounding reasoning as a *reductio ad absurdum*--effectively, a logical joke, a parody of bad reasoning--directed against Parmenides and the Eleatics. Dodd and Guthrie differ only in whether the *consequences* of the joke are serious, not on whether Gorgias genuinely advocates the position that nothing exists, and if it did, so what, we couldn't know it. Even the few scholars who don't see anything absurd here (Enos is the clearest recent example, who also provides a tidy summary of the critical debate, 1993, 81-83; see also Kerferd 1981, 92-99), simply proceed by mitigating the obvious absurdity (in Enos's case, by arguing that, sure, Claims α and β are crazy on the face of it, but they've been misunderstood; really, Gorgias was just talking about relativism, not existence and the possibility of perception). In effect, this is my line as well (and Kerferd's), though I am bypassing their careful philological focus on Claims α and β and concentrating on Claim χ . And, in any case, I have invoked these utterances just to exploit them, not to investigate them responsibly

⁶ More strictly, in Gorgias's argument this claim is really two, χ^1 and χ^2 , the former that there is no speech (or, perhaps, no representational speech), the latter that (even if there is speech) it cannot "manifest most of the existing things" (VII 85). Claim χ^1 is subject to the same paradoxical corrosion as Claims α and β , and I will consequently ignore it.

⁷ This is Booth's point in *Modern dogma*, about nihilistic or absurdist art, which necessarily implicates a desire to communicate something to someone, so that "the internal claim that all life is meaningless ... [must always be] self-contradictory in any realized work of art" (1974b, 178).

⁸ Zhao's article (which has not dated, because the positions have developed no further) offers a very nice summary of the rhetoric-as-epistemic debates in the wake of Scott (1967). He identifies a weak version of the position (that knowledge is found in all sorts of ways and rhetoric helps winnow out errors via the clash of opinion), and a strong version (that knowledge is created by discourse). The strong version, further, comes in two sub-versions, the restricted strong claim (that the rhetorical creation of knowledge only occurs in a specific domain, namely, 'human affairs') and the non-restricted strong claim (that the rhetorical creation of knowledge applies in all domains,--in particular, as the most hard-nosed case, in science). He charts out the various

players effectively, but he goes somewhat astray on the person he holds most responsible for the non-restricted strong claim, Barry Brummett. In missing the mark on Brummett, he misses the mark on the non-restricted strong claim. Here, first, is an extended passage Zhao quotes from Brummett:

When people seek intersubjective truth by comparing their meanings they are involved in rhetoric; for some meanings will be advocated and some scorned, some chosen and some abandoned ... only in an intersubjective world created by rhetorical beings could rhetoric be central. But more than that; a world view in which truth is agreement must have rhetoric at its heart, for agreement is gained in no other way. (Brummett 1976, 35; Zhao's elision, 1991, 258)

This passage is worth including in its own right, but it's here also so that I can attend to Zhao's gloss of it: "the eagerness to avoid self-contradiction has led Brummett to sheer absurdity: the purge of objective reality" (1991, 258). But Brummett, as I read him, is not guilty of purging reality, objective or otherwise. He is not making an ontological claim. Rather, he purges objectivity, is agnostic about any ultimate out-there, and claims that what we designate by the word *reality* is an inter-subjective, rhetorically mediated product. I take up Zhao here, rather than the better known survey of these positions by Leff (1978), because Leff's account came relatively early in the debate, but Zhao's non-restricted strong version is effectively Leff's (at the time "incipient") strain iv, "rhetoric as knowledge" (1978, 52ff).

⁹ Bazerman (1988), Prelli (1989a). The mid-seventies arguments for rhetoric of science include Wander (1976), Finnocchiaro (1977), Overington (1977), and Weimer (1977). For a usefully trim history of Sociology of Scientific Knowledge, see Potter (1996, 25-33). For "literary critics", I am thinking primarily of William Powell Jones (1966), whose book on eighteenth century poetry is actually entitled *The rhetoric of science*. For representative historians, see the Benjamin et al. collection (1987). For representative philosophers, see the Pera and Shea collection (1992). For a recent book on social constructivism, see Hacking (1999). For other work breezed by in the preceding stretch, proceed directly to Works Cited. Much of this section is a highly compressed version of my introduction to the *Landmark essays* volume on rhetoric of science. See it for amplitude and further citations (Harris 1997).

¹⁰ I am commandeering Gross's useful distinction (1989, 52) here, between rhetoric as a discipline (the subject of this essay) and a perspective, the way in which rhetoric (more or less) participates in several other disciplines generally, and in the rhetorical turn in science studies specifically.

¹¹ These aversions are expressed by the editors as a way of repudiating the implications of a rhetoric-as-epistemic position. However, not all the essays contained within it (especially those by Pinch, Campbell, and Lyne) are equally uneasy about rhetorical intersections with epistemology.

¹² The Krips-McGuire-Melia position is partially aligned with Gaonkar (as are earlier papers by McGuire and Melia,--1989, 1991, and 1995; see Gross, 1991, in response). The *Science, reason, rhetoric* preface is largely motivated by the hegemonic-rhetoric vexation that so possesses Gaonkar, and Gaonkar endorses their recurrent *sub-specie-rhetoricae* slogan (1997a, 45). He also serves up his assault on global rhetoric "as a token of affection" to Melia, his teacher (1997a, 78).

¹³ It all started innocently enough. Alan Gross and John Lyne organized a rhetoric-of-science session for the 1991 Speech Communication Association conference. The session was entitled "New directions for the nineties", a more prophetic title than anyone could have guessed. Gaonkar's lengthy complaints, first voiced in that session, preoccupied the decade. In 1993, a special number of the *Southern communication journal* was devoted to his case and several responses to it, including those from some of founding fathers of rhetoric of science,--Gross, Campbell, and Prelli, as well as Michael Leff, an important voice in the rhetoric-as-epistemic debates, and Steve Fuller, the leading proponent of social epistemology. In 1997, came the book, *Rhetorical hermeneutics*, again showcasing Gaonkar's essay; along with beefed-up versions of most of the *Southern communication* responses (only Prelli opted out, saying the debate was pointless and sterile); and additional responses, from additional prominent figures in rhetoric of science (Donald Dierdre McCloskey and Carolyn Miller), from additional prominent rhetoricians (Thomas Farrell and Charles Willard), and from additional additional; all topped off by a response-to-the-respondents by Gaonkar. In 1999, Herbert W. Simons, one of the few early rhetoricians of science not to have spoken up yet, served up his answer to Gaonkar, Campbell weighed in for a third time, Willard offered another commentary; then Keith, Fuller, Gross, and Leff all came back (jointly) at Simons. See also Allard 2000; Selzer 1998; Lambert 1998; Campbell and Benson 1996.

¹⁴ Well, there is *this* explanation: "Gaonkar is clearly good for our business," Campbell said in his role as the 1998 president of the American Association of the Rhetoric of Science and Technology, "so little are Gaonkar's charges against us believed, and so useful are they in garnering us attention, that we boast of an impressive array of new recruits particularly among younger faculty and graduate students" (1999, 101).

¹⁵ Of the respondents to Gaonkar, only McCloskey attends to, and rightly dismisses, the *si omnia* driving Gaonkar's argument (1997a, 107ff). Simons appears to endorse this dismissal (1999, 86-7), but is discomfited by her rather florid tone (1999, 97n1). The axe head of Gaonkar's argument is *si omnia nulla*, and that is the only argument I will take up in any detail here. But other weaknesses in his case are worth noting briefly. He follows a course plotted for him a few years earlier, by Carolyn Miller (1989, 102), of arguing against any 'expansion' of rhetoric because "rhetoric is a particular theory of discourse, with particular historical resources, [and so] the term is best reserved for uses entirely consistent with that history". But Gaonkar's productionist premises, for instance, rest on an extremely superficial and selectively attenuated history, a history which not only ignores the sophistic origins of rhetorical theory, but also a wide number of elements of the productionist tradition itself (for instance, imitation, which is predicated on critical examination). Moreover, the mediaeval and renaissance rhetorical treatises--the period in which rhetoric became preoccupied with aesthetic matters--were far from simple productionist handbooks. They were equally about the critical appreciation of discourse. With the 18th and 19th century, largely kicked off by the belletristic movement, rhetoric moved further into aesthetic appreciation; indeed, the history of literary criticism is inextricably bound to the history of rhetoric, from Aristotle's *Poetics* on, and literary criticism is *fundamentally* interpretive. More tellingly, all productionist vocabularies necessarily contain the seeds of criticism. When one analyses a building, one uses the language of architecture. When one seeks to understand a bridge, one uses the language of engineering. Specifically of hermeneutics, Schleiermacher said, early in the nineteenth century, "the unity of hermeneutics and rhetoric results from the fact that every act of understanding is the obverse of an act of discourse" (1978, 4). (See the essays by Leff, Campbell, and Miller for these and further problems with the productionist/interpretivist divide; see Eden (1997) for a more general and detailed discussion of the links between hermeneutics and the ancient rhetorical tradition). Even within his superficial history, Gaonkar

willfully ignores many of the driving forces of productionist rhetoric. Figuration, for instance, gets no mention at all, and even Aristotle acknowledges the reason-shaping nature of figures like metaphor. Genres, too, are spared comment. Forensic rhetoric, in particular, is a rhetoric of debate and exchange, of advocacy and judgement, and, as many have noted, is exactly suited to the scientific marketplace of ideas. Too, rhetoric as practiced by rhetoricians of science, and rhetorical critics generally, is not an isolated Aristotelian deer park. Nor should it be. Our vocabulary has been augmented not only by scholars like Richards and Burke and Perelman, but also Neitzche, and Vico, and Suassure, and Bakhtin, and Gadamer. Merely because we are historically allied to a specific ancient vocabulary does not mean that our ears are closed to other scholars of figuration and argument and influence and language. Even if Gaonkar could successfully indict the narrow, historically and theoretically impoverished rhetorical lexicon that he indicts--and I think even here he fails--the strongest conclusion he is warranted to draw is that the vocabulary requires enrichment. (See Gross's essay and Simons's 1999 review for more of this response.)

¹⁶ The implication (contradicted by other sections of the *Rhetoric*) is that rhetoric and dialectic have no purchase on expert discourses. (I discuss briefly in my introduction to the *Landmark essays on rhetoric of science* the extent to which this apparent prohibition hindered the American neoAristotelian rhetoricians from the rhetorical criticism of science--xiii-xv). And, of course, his policy statements draw a rather tight generic circle around rhetoric (formal discourses of the courts, assemblies, and ceremonies).

¹⁷ Here's the relevant passage: "But there are also those special Lines of Argument which are based on such propositions as apply only to particular groups or classes of things. Thus there are propositions about natural science on which it is impossible to base any enthymeme or syllogism about ethics, and other propositions about ethics on which nothing can be based about natural science. The same principle applies throughout. The general Lines of Argument have no special subject-matter, and therefore will not increase our understanding of any particular class of things. On the other hand, the better the selection one makes of propositions suitable for special Lines of Argument, the nearer one comes, unconsciously, to setting up a science that is distinct from dialectic and rhetoric. One may succeed in stating the required principles, but one's science will be no longer dialectic or rhetoric, but the science to which the principles thus discovered belong.

Most enthymemes are in fact based upon these particular or special Lines of Argument; comparatively few on the common or general kind" (*Rhetoric* 1358^a).

¹⁸ This group does regrettably include people working in the rhetoric of science,-- for instance, Tiede, 1998.

¹⁹ See (literally) *The atomic café* (Loader, Rafferty, and Rafferty 1982). A companion book is available (Rafferty 1982), and the first director has a website on the movie: <http://www.publicshelter.com/main/tac.html>. Also: http://conelrad.com/atomic_cafe.html.

²⁰ The oblique relationship I have in mind is the situation in which a critic might point to some symbolic act and say "lo, rhetoric" before going to work investigating it from that perspective; then, some some half-attentive onlooker might extrapolate to "lo, only rhetoric", to the belief that the symbolic act has no other features beside the rhetorical. A move in that direction does lead to pleonasm, but the move is a *non sequitur*: saying, for instance, that all languages have words does not mean that is all they have, that they don't also have (moving lower) phonemes and morphemes or (moving higher) sentences and speech acts.

²¹ Incidentally, *si omnia* is regularly associated with post-modernism, usually in an effort to scold it. The passage from Porter quoted above is in an essay on striking the right post-modern balance in rhetorical theory, and even as astute a thinker as Philip Kitcher can lazily invoke these demons: "The post-modernist, for whom rhetoric is everything, does not see the cognitive structure of scientific debates" (1995, 61). Notice, first, that the relative clause is non-restrictive: rhetoric-as-everything is definitional of "the post-modernist". Notice, second, that if, say, the post-modernist had a cognitive theory of rhetoric she would not be forced thereby miss the structure of debates, and even if she did, nothing in a capacious rhetoric would oblige her to miss the cognitive structure, and even if he did, her investigation would not foreclose the possibility of Kitcher coming along and seeing the cognitive structure without ever troubling himself about her dispositions. And notice, third, that *cognitive* suffers from as much elephantiasis of reference these days as *rhetoric* ever has.

²² One can't be sure, but it looks as if Kennedy has *ergon* in mind when he offers his own very elemental definition of rhetoric as "a form of mental or emotional energy" (1998, 3, 7): he introduces the whole

discussion of the essence of rhetoric with Aristotle's definition as a way of pointing outwards from a productivist treatment.

²³ Gaonkar, in fact, invokes Plato's assault in *Gorgias* on the following page (1997a, 27). Noteworthy, too, is Keith, Fuller, Gross, and Leff's response to Simons's response to Gaonkar on the nature of rhetoric. "Conceptually," they say, "we are haunted by Gorgias", whom they go on to condemn for having "no good answer, only a grand aspiration" to the question of what the subject matter of rhetoric might be (1999, 331). The context makes it clear, though, that they are haunted not by Gorgias but by the Platonic puppet, "Gorgias".

²⁴ The *Gorgias* is important etymologically as the first extant occurrence of the word, *rhetoric* (*rhêtorikê*), a fact which some recent arguments have used as the lynch pin of the position that rhetoric is an inescapably Platonic enterprise, that rhetoricians should all cut bait and leave the fishing to philosophers. Such a position is akin to arguing that John Mason Good invented menstruation because his usage of *period* in the relevant context is the first one the *Oxford English dictionary* could turn up, but it gives a philological backbone to the fear and loathing that regularly surfaces in rhetoric about its philosophical status. See especially Cole (1995), kin to Gaonkar, who dismisses the sophists as engaging in 'protorhetoric', and Burkean, Perlemanean, Ricouerean contemporary scholars as making a category error (he calls what they do, 'neorhetoric'); and Schiappa (1991), who is more concerned to bring a fuller understanding to what the sophists were up to. Robert Wardy disputes that first extant means first ever, and thrashes Cole on several other counts (1996, 166n.8); Stephen Halliwell says the context of Plato's usage indicates "unambiguously that the word already had some currency" before the *Gorgias* (1994, 224); and Richard Marback's *Plato's dream of sophistry*, which investigates the historical contours of Plato's shadow on rhetoric, begins by critically examining Cole's and Schiappa's arguments (1999, 5ff). The most pointed comment on the debate is Ramsey Eric Ramsey's: "Whether Plato coined the word rhetoric, what is striking is that he was the first to attempt to make it disappear" (1999, 247). John Mason Good's fascinating *Study of medicine*, incidentally, manifests the same attitude toward women that Plato evinces of sophists; a castrated male, he says, "sinks down into the female character" (2.419).

²⁵Gaonkar's posture is ten percent mild concern, ninety percent disinterested curiosity,--bemused by attempts (like Vickers's 1988) to save rhetoric from itself, and thoroughly entertained by the spectacle of neosophists wantonly sowing their scrawny vocabulary in every port, but with no particular stake in the matter himself. But the posture is not persuasive. He has a project: "to critically measure [the] hermeneutic resources and burdens [of rhetoric], and thereby obviate its lapse into ideology" (1997b, 330). He wants to roll back the borders of rhetoric. Science, of course, doesn't belong in its province, but it is only a synecdoche for Gaonkar, representing the vast universe of discourse that is inherently unavailable to rhetoric; other discourse domains he doesn't name, though intimations abound that everything outside "the civic realm" is suspect (1997a, 26). And, even here, he wants to repeal any interpretative or critical function. Which, of course, returns us to Plato: rhetoric as a procedure for tarding up arguments it provides no tools for understanding. As if to remove all doubt as to whose project he is pursuing, Gaonkar asks "is rhetoric an art or a mere routine as Plato insisted?" (1997a, 27). He is coy about the answer on this occasion, though the slouch of his argument is unmistakably toward mere routine. In any case, an answer here is unnecessary: another prosecution, a few years earlier (against rhetoric of inquiry and epistemic pretensions generally), contains Gaonkar's response: "rhetoric cannot escape its 'mereness'" (1990, 341). In responding to Simons' (1999) objections to Gaonkar's *si omnia* argument, Keith, Fuller, Gross, and Leff dust their hands of those objections with "he's just missed the point" (1999, 31). The question is not, they say, whether rhetoric should go global or not (they concede it has; Gaonkar complains it has), but whether going global is good or bad. Well, sort of. Gaonkar is not just posing a question, or politely calling upon us to pose it, he is giving us the answer: it's bad (illegitimate, wrong, a big festering error).

²⁶In truth, Brummett gave passing notice to this as well. He labels rhetoric of science one of the "descendants" (along with the theory of argument) of the rhetoric-as-epistemic movement. That's a little strong, given the work of Campbell, for instance, which began before much of the epistemic bruhaha, and the relative paucity of citations to Scott or other work of the movement in the rhetoric of science papers. But it does not seem coincidental that case studies began to mushroom precisely at the apex of the debate. See Lyne (1998) for a more recent account of the rhetoric of science and rhetoric as epistemic linkages, and the special

issue of *Argumentation and advocacy* (35.1) in which Lyne's paper appears for interesting recent commentaries on the line of inquiry Scott opened up.

²⁷ Even Jean Dietz Moss--the only scholar of consequence I can think of in the orthogonal category--included an afterward of sorts to her important book, *Novelties in the heavens*, which tepidly and confusedly discusses epistemology and the 'depth' of rhetoric in science. She seems to throw her lot reluctantly in with the is-to, but-only-a-bit crowd. .

²⁸ I have, as above, much less confidence than many commentators in ascribing specific beliefs to Gorgias on the evidence of such mercurial fragments, but he is generally regarded as thoroughly relativist as it is possible to be (e.g., Enos 1993, 77).

²⁹ "Indeed," as W. H. Newton-Smith remarked, one of the sturdiest results of induction is "*a pessimistic induction*: any theory will be discovered to be false within, say, 200 years of being propounded" (1981, 14)

³⁰ It is worth noting that, like Gorgias, Gödel relied on the power of paradox for his anti-certitude argument. In Douglas Hofstadter's useful analogy (1979, 21), Gödel found in mathematics the unavoidable existence of objects akin to these two contiguous sentences:

- i The following sentence is false.
- ii The preceding sentence is true.

Sentences i and ii are clear. Their deixis is unimpeachable. There's nothing wrong with them. They're just incommensurable. They blow up when they're pointed at each other. The expressive power of language generates the paradox. Symbols are chess men, thinkers like de Saussure and Wittgenstien have told us: "they stand for what can be done to them according to known rules, and the rules which govern the use of mathematical symbols are more strict than those which govern the use of words" (Oakeshott, 216). Hence: optimism, even faith, that mathematics would save the day and ground certainty. What Gödel showed was that even in the severely constrained expressiveness of mathematics, such absurdities are inescapable, and certainty is left groundless. Bickerton explains such paradoxes in the following way: the absurdities that flare up when sentences of this sort come into contact do

not arise from either sentence in isolation, still less from some logical flaw at the heart of the universe. [They arise] because of the peculiar doubleness of language on which the duality of consciousness rests: the capacity to perform an act (in this case, make a proposition) and simultaneously comment on that act. Each sentence ... is a comment on a proposition, but comments on propositions are themselves propositions. (1990, 209)

Russell's paradox revealed exactly this kind of doubleness in set theory; Gödel's theorem formally demonstrated that no mathematical system can be rid of this doubleness.

³¹James, of course, does not have figures in mind here. He is describing more general patterns of conceptual allegiance, which he often calls "terms of discourse" (1981, 84) but which rhetoricians recognize as topoi. There are ways of treating topoi and figuration that see them of a piece. For instance, metaphor, the figure, and comparison, the topos, are clearly very closely linked; as are antithesis, the figure, and contrast, the topos; synecdoche and parts-to-whole. See Fahnestock (1999, 23-36) for a survey of such treatments. My own money would be on a unification of many figures and topoi in deeper principles of the mind,--something like Bain's elementary attributes of intellect, which he enumerates as: "(1) Consciousness of *Difference*, (2) Consciousness of *Agreement*, and (3) *Retentiveness*", adding that "every properly intellectual function involves one or more of these attributes and nothing else" (1868, 82). I'm not as sure as Bain that this is an exhaustive list; the notion of predication needs to be worked in as a primitive concept, I think, and perhaps a notion of constituency, and repetition is utterly inescapable (though it might be entailed by 3). But even sticking with Bain's three (indeed, two; retentiveness seems a capacity not an attribute), one can account for a good many of the more effective topoi and figures. I'm not going to pursue this line any further in this essay, however.

³² Of course, these conditions for subtraction and division are suspended for the special cases where $m = n$.

³³The poached examples, and her brilliant treatments of them, are from the *Rhetorical figures* chapter on antimetabole (1999, 122-155): Lewontin (154-5), Euclid (135-6), Pasteur (139-40), Newton (142-3), communitative laws for addition and multiplication (134).

³⁴ In fact, Hemingway seems to have been rather fond of antimetabole, coining his own term for it. He summed up the argument of *Old man and the sea* to A. E. Hotchner as "Man can be destroyed but not defeated", which he said was one half of

"the oldest double *dicho* I know".

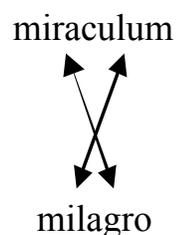
"What's a double *dicho*?' I asked.

"It's a saying that makes a statement forward or backward." (1966, 73; see also 184, 229)

Indeed, Max Nänny argues that chiasmus is a deeply architectural instrument in Hemingway's fiction, "both on the narrative and subnarrative level" (1997, 158)

³⁵ From "Don't go no farther", written by Willie Dixon, who liked to emphasize the reciprocal necessity of romance with antimetaboles; a more famous one is "I'm ready for you / I hope you're ready for me" ("I'm ready"), which Muddy Waters also recorded (Willie Dixon, so far as I know, recorded neither). One written by Muddy Waters is "I live the life I love, and I love the life I live". Cf. Waters (1990).

³⁶ In fact, it's not confined to only the syntactic level. Metathesis, a common phonological phenomenon in historical change and language acquisition, involves a sound swap which leaves the new term and the old term in an antemetabolic relationship: wasp, for instance, comes from the earlier form waps, third comes from thridda, ask comes aksian (and, in some dialects the consonants have metathesized back again, into aks). One introductory linguist text even offers the following visual account of a Latin to Spanish metathesis (O'Grady and Dobrovolsky, 1996, 282):



³⁷ Haixia Wang has kindly provided me with the following gloss:

Zhi Zhe Fu Yan	A B C D	Knowing ones no words
Yan Zhe Fu Zhi	D' B C A'	Talking ones no knowledge

"The B's and the C's are completely identical in Chinese. The A/A' and the B/B' differ only in parts of speech; this cannot be seen or heard since they are alike both in form and in pronunciation/tone." There is, then, also some kind of stable form but category-shift polyptoton at play as well, in rough parallel to an English example like "when the going gets tough, the tough get going" (*going* is a gerund in the first clause, a present participle in the second; *tough* is a predicate adjective in the first clause, a nominal in the second)

³⁸I call metonymy and synecdoche "a complex" to bring them together into the same discussion, somewhat arbitrarily privileging metonymy. As Corbett notices, they "are so close to being the same trope that George Campbell . . . wondered whether we should make any great effort to distinguish them" (1971, 481; Campbell 1963, 302). The problem, of course, is that metonymy is not one trope but a moderately loose cluster of them; in another of his complaints, Campbell mutters that metonymy has so many extensions he wonders if it "can be called one species" (1963, 303), proceeding to discuss those extensions as the 'tribes of metonymies' (e.g., 1963, 307). The principle uniting those tribes is the loose "substitution of one noun for another" ('*nominis pro nomine positio*', Quintilian, 8.6.23; *nominis/nomine* here are usually translated as *name*, and *name* features prominently in most definitions of *metonymy*,--which is nicely appropriate, since *name* is a metonymy for *noun*, but also quite misleading). The *Ad Herennium* gives seven substitutions, which became more or less canonical, but they might be multiplied almost indefinitely; see below some of the categories cognitive linguists draw attention to. There are two general strategies to the commingling of metonymy and synecdoche. Either one is seen as a species of the other ("metonymy may be treated as a special application of synecdoche", says Burke 1945, 509), or they are both seen as manifestations of the same linguistic move ("figures of substitution", Perelman and Olbrechts-Tyteca call them, noting that "there may well be hesitancy in interpreting the figure as a metonymy rather than a synecdoche or vice versa"-- 1969, 336). This latter route is Campbell's, and the metonymy/synecdoche overlap for him has a distinctly cognitive cast: they both follow "the bent of the imagination" in the same direction, "both pointing to that particular with which the subject is spoken of is immediately connected" (1963, 302). It's actually only some extensions of metonymy that have this overlap for Campbell. Synecdoche, given a somewhat tidier domain, is a substitution of the (noun naming a) part for the (noun naming a) whole, and vice versa. Metonymy is a hoard of noun-for-noun substitutions,

under some informal constraint that the nouns be somehow related or mutually evocative; synecdoche is a pair of noun-for-noun substitutions, under the generally clearer constraint of a specific set-theoretic relationship. For my purposes, the metonymy/synecdoche complex is an substitution governed by category membership.

³⁹ See, in particular, Kövecses and Radden's "Metonymy: Developing a cognitive linguistic view", which in turn is shaped by Lakoff and Johnson's (1980) *Metaphors we live by*, and Lakoff's (1987) *Women, fire, and dangerous things*, and various publications by Ronald Langacker (especially his 1987, 1991), as well as the work of other cognitive linguists. For good introductory discussions of metonymy from the vantage of cognitive linguistics, see Ungerer and Schmid (1996, 114-155). As a brief sample of this work, take the pervasive conceptual metonymy, CONTROLLER FOR THE CONTROLLED:

- i Fred loaded six dump trucks by noon.
- ii Barney built his own home.
- iii Wilma scorched the brontosaurus burger.
- iv Bam-Bam mowed the lawn.
- v Betty printed her thesis on the new bubble jet.
- vi Mr. Slate extracted one million metric ton of granite last year.

As Ogden and Richards point out, we routinely say such things as "Bam-Bam mowed the lawn" even though "we know that it is the lawn-mower which actually does the cutting" (1949, 9); similarly, heavy equipment loads dump trucks, not individuals, which is why that equipment is called a *loader*; Barney can build his own home without lifting a hammer or a chisel; barbecues, not 98.6° F humans, scorch meat; machines put ink on paper, not people who choose an option from a pull-down menu; fleets of equipment, and operators, extract ton of granite, not CEOs; Mr. Slate might have been in Bermuda when all the work was done. In short, there is a systematic metonymical structuring to our discourse that allows the name of the controller to stand for the name of the controlled. What's more, as has long been noted about metonymy, the relationship is reciprocal. Here are a few examples of the conceptual metonymy, CONTROLLED FOR THE CONTROLLER:

- vii The airports are on strike.
- viii That chevy was driving recklessly.

ix Carter's home run won the series.

And, a smattering of others:

PART FOR WHOLE	All hands on deck.
WHOLE FOR PART	Fill up the car, will you please?
CATEGORY FOR MEMBER	She's on the pill.
MEMBER FOR CATEGORY	We're out of kleenex.
PRODUCER FOR PRODUCT	I've read a lot of Hemingway lately.
PLACE FOR INSTITUTION	The Vatican disapproves of divorce.
CONTAINER FOR THE CONTAINED	Her chicken diablo is the best dish here.

⁴⁰ I confess that Booth introduces this phrase largely as a way to exclude irony from science; he's wrong, mostly I think because he knows scientific discourse primarily by its (mid-century) reputation, not by any sustained encounters with it.

⁴¹ I go on about this at even greater length, in my 1990 paper, "Assent, dissent, and rhetoric of science", though I don't link it to irony in any way. For specific treatments of irony in science, see: several of the essays in *Understanding scientific prose* (Selzer 1993; the index will guide you to the scattered discussions); Gross on Watson and Crick (1990b, 62-65); Halloran (1997, 42-43); and, especially, Myers (1990, 155ff, 214-238, *et passim*). Irony has developed into a term of some importance in Sociology of Scientific Knowledge (which is the way Myers deploys it). See Potter (1996, 107, 112-113) for a brief account and further sources.

⁴²He overstates the case incredibly insofar as he wants his argument to be species specific, but that only means that the spirit of negation runs deeper than he supposes. It's true enough that when, say, a scout bee, call him Bee₁, returns to the hive and dances his triumphant dance of the nectar source, wiggling his little butt to indicate amount, zooming in antithetical circles to signal the distance and direction, no other little bee, no Bee₂, disputes the claim, dancing out an argument that the hive can't spare such a gathering party right now, and, the weather isn't propitious, and in any case, Bee₁'s credibility on these issues is somewhat questionable. But just because they don't dance them doesn't mean they're not there; bees more than likely have lots of

negative categorization (not-bee, not-nectar, not-from-my-hive, and the like). And one needs only see a couple of dogs disputing between them who is the toughest mutt in the junkyard to recognize that disputing category membership is not exclusive to featherless bipeds. What makes us distinct in the realm of negation is very likely the ability to negate while superficially asserting: irony.

⁴³ The only one of these components he explicates directly is how one might predict the beliefs of a "rational agent": "One starts with the ideal of perfect rationality and revises downward as circumstances dictate. That is, one starts with the assumption that people believe all the implications of their beliefs and believe no contradictory pairs of beliefs" (Dennett 1997, 64).

⁴⁴ Plato may have had the opening of Gorgias's *Helen* in mind here, the lead epigram to this essay, where Gorgias says that truth is to speech as beauty is to a body.

⁴⁵ Repetition of a word in different morphological dress: "With eager feeding food doth choke the feeder", Shakespeare, *Richard II* 2.1.37.

⁴⁶ For Black's allegiance to Plato, see his "Plato's view of rhetoric" (1958).

⁴⁷ Turner's use of *cognitive rhetoric* (there is another, which I'll get to anon, and some related research) is highly consonant with my approach in this essay. Figuration is pervasive and constitutive in discourse for Turner, and his driving concerns are how it leads to knowing and what it reveals about the structure of the mind. The fact that his work grew out of the analysis of literature, still the anchoring discourse for his interests, means he is concerned with a somewhat more diffuse sense of what comprises knowing than that generally associated with science. While he makes informed use of rhetorical theory in critical readings, it is rarely in application to rhetorical problems; his most thoroughly rhetorical stretch of commentary in *Reading minds*, for instance, is a chapter entitled "The poetry of argument". I am appreciative--indeed, inspired--by Turner's work, but I don't see this essay as elaborating his programme in any clear and direct way. Rather, it emulates his pioneering efforts in a different domain. The label *cognitive rhetoric* is also associated with the work of Linda Flower and her colleagues (especially psychologist John Hayes). Neither Flower nor Turner demonstrate any awareness of the other, so far as I can detect, but Flower's programme was the first to wear the label. It is allied most closely with academic composition instruction, developing out of research in the 1970s that shifted the

focus of writing instruction from products to processes. Flower sees the fundamental move of cognitive rhetoric (in her sense) as "recognizing that cognitive processes do not exist in the abstract", and the chief results constituting a picture of "how writing is influenced not only by the structure of the task but also by the way individual writers represent the task to themselves, by social rules, by the ongoing interaction of people involved, and by the wider social and cultural milieu" (Long and Flower, 108). Two other developments at the intersection of cognition and rhetoric call for some commentary in this regard. The first development is in the work Michael Billig, a psychologist, as epitomized in the title of one of his books, *Arguing and Thinking*. Billig's view is that the two processes named in his title are reflexes--one external, social; the other internal, mental--of the same human activity. Thinking is internal arguing; arguing is external cogitation. The body of resources he uses for charting and explaining these processes comes from the rhetorical tradition: "rhetoric, as the traditional study and practice of argument, provides an entry to, and understanding of, thinking" (1993, 121). Billig, in effect, brings rhetoric to psychology. The second development is in Richard Gregg's unfortunately neglected *Symbolic inducement and knowing* (1984), which has the (antimetabolic to Billig's) motivation of bringing psychology to rhetoric. The phenomenally rapid developments in cognitive psychology especially, and cognitive science generally, over the last decade has dated Gregg's book somewhat. But its drive to anchor suasion (symbolic inducement) in elemental brain functions, like rhythm, and boundary formation, and hierarchical structuring, remains profoundly important. His perceptual and conceptual emphases make his work especially conducive to the cognitive dimensions of figuration. Neither Billig nor Greg, however, go far enough for my purposes. Billig, in particular, does not go much beyond his thesis that talk is thought, thought is talk. He asserts the critical importance of argumentation, but regards argumentation as "irreducible" (1993, 11), and is largely uninterested in bits and pieces of argumentation, the life's blood of rhetoric. And Gregg, despite his fascinating incorporation of neurocognitive findings (25-55), similarly avoids the rhetorical bits and pieces. Both books are also incredibly neglectful of figuration. Billig pays some slight (but significant) shrift to Burke's Master Tropes, Gregg not even that. In large part this omission is probably an attempt to avoid the stigma of 'mere rhetoric'--"the present intention is to promote an argumentative rhetoric, rather than a rhetoric of adornment, for it matters little whether tropes fly forth from the open mouths or

psychologists, or whether old-fashioned labels can be put to the tricks of the modern advertiser" (Billig 1987, 34). The omission is especially egregious in Gregg, because many extrapolations from his work seem natural. He adopts a principle of association, for instance, which is a short step from metaphor, simile, the metonymy/synecdoche complex, and the like. His attention to rhythm ought to lead him naturally to the figures of balance and repetition (isocolon, assonance, consonance, and so on). His inclusion of the perceptual notion of edging suggests figures such as asyndeton and polysyndeton, perhaps epistrophe--figures that do their work at the edges of clauses and phrases. Alas, he doesn't seem to care.