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AUTHOR Watson, Sam, Jr.
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ABSTRACT

The focus of this paper is on Michael Polanyi, a contemporary scientist and philosopher, and on some general features which are embedded in rhetorical theory's traditional bases and contemporary manifestations and which are seen from Polanyi's vantage point. The author discusses the basic features which undergird rhetorical theories and are central to Polanyi's analysis of scientific communities, details the characteristics common to the study of rhetoric in the contemporary world, and sketches the confusion rhetoricians currently have concerning the nature of science and of their own field. The paper then explores Polanyi's concerns and his conception of scientific communities and suggests the shape of his epistemology. (JM)

Polanyi, Rhetoric, and the Independence of Scientific Inquiry

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by Sam Watson, Jr.
Department of English
University of North Carolina at Charlotte

In this paper I will be introducing some dimensions of the thought of the contemporary scientist and philosopher, Michael Polanyi, a man who sees himself not as a theorist of rhetoric but as a philosopher of science, a man whose insights may be especially valuable to us for that reason. First, however, I will suggest some very general features which I believe are deeply embedded in rhetorical theory's traditional bases and contemporary manifestations, features which I frankly see from the vantage point Polanyi provides. If, to paraphrase one of our recent presidents, I am standing on the shoulder of a giant,[1] in much of this paper I will nonetheless be looking in directions somewhat different from those which have occupied his own attention. It is important to look in those directions, for in finding some features which undergird any responsible rhetoric, we will also find that we contemporary rhetoricians are instructively ambivalent concerning the nature of science, an attitude which implies an unfortunate ambivalence concerning our own field and some features which undergird it. If the Polanyian point of view helps us discover such a problem

in our own field, it is a problem closely akin to the one which called Michael Polanyi to philosophy, a problem which will warrent further study of Polanyi than can be represented in this paper.

What image of man can Western man make available to himself which will undergird freedom of investigation and the life of thought in the various fields of intellectual, artistic, and spiritual endeavor? That question, by no means merely an "academic" one, is the sort which calls Michael Polanyi to philosophy. And if I may hazard a guess which is partly confession, it is the sort of question which brings many of us to the study of rhetoric.

It has proved impossible for rhetoricians ever to agree precisely and explicitly on just what rhetoric is, a point that may prove instructive instead of embarrassing. Whether it is a matter of "enchanting the soul by argument" (Plato), or "discovering in any given situation the available means of persuasion" (Aristotle), or "rooted in an essential function of language itself . . . the use of language as a symbolic means of inducing cooperation in beings that by nature respond to symbols" (Burke),[2] most of us would be unwilling precisely to say, preferring instead the humanist's vagueness (or perhaps his wisdom) that each of these definitions has something to offer, thus tacitly acknowledging that none of them explicitly captures all of whatever it is we study, when we study our subject.

Those definitions and others embody important differences. But beneath any of them lies a deep foundation, a matrix of some features shared by a wide variety of definitions. It is not my task to excavate that foundation, but I do want to dig deeply enough to suggest the shape of some of its features. They may sound commonplace, but we belong to a discipline which believes the

commonplace is important, and we may find that these features are less commonplace than problematic in the contemporary world.

The first feature, and perhaps the deepest one, is that man is an agent. He acts, making more or less intelligent choices, rather than being moved in ways predetermined by his own structure or his environment. The notion of man as agent informs Plato's insistence that the soul is "unmoved mover" (Phaedrus, 245); it lies beneath Aristotle's insights that because rhetoric is in various ways concerned with men's actions, its province is the contingent, "that which . . . is capable of being otherwise. . ." (Nich. Ethics, 1140b2), rhetoric never guarantees persuasion, (Rh 1355^{b}) and that the audience is the rhetor's judge, not his victim. Perelman entitles an essay, "Act and Person in Argument,"[3] and Kenneth Burke insists that his rhetoric "is built atop the proposition that things move and persons act."[4] Indeed, the reality of human action is presumed by any concept of a rhetoric which is advisory. If man does not really have choices to make, it is simply superstitious or hypocritical nonsense to think of rhetoric advising him as he makes choices.

A second feature is that argument is properly informed not only by facts but by values as well. Rhetoric brings fact and value to bear in its appeals to action; in so doing, it implies that no unbridgeable chasm divides value from fact.

Third, the tradition has consistently given us three modes of proof proper to rhetoric, not just one. Richard Weaver objects to the "notion that man at his best is a logic machine,"[5] and already in the ancients we see that as well as its logical dimension, rhetorical argument properly embodies dimensions of emotion and of ethos. It embodies intellect, emotion, and will — if we believe in faculty psychology — or it implies that these three are somehow inseparable, if we do not.

Fourth, we recall from Aristotle that the premises of enthymemes are not usually rendered explicit. In taking that stance, I believe Aristotle and others in the tradition are insisting that rhetorical argument is based on beliefs shared by rhetor and audience and that those beliefs can and should often remain tacit. Generalizing, meanings exist which are not explicit, a point Carroll Arnold suggests when he says, "Orality . . . . is itself meaningful" and continues to talk about "meanings [which] are seldom verbalized."[6] Rhetorical argument is based on meaningful but tacitly shared beliefs.

Fifth, since the often-tacitly shared beliefs on which the rhetor constructs his arguments are at least partly a product of past experiences and judgments, rhetoric presumes that the past is relevant to the present. Weaver puts it strongly, "Rhetoric depends upon history."[7]

The comprehensive nature of rhetorical proofs and the tacit character of some rhetorical meanings are surely some of the features which lead contemporary theorists to insist that rhetoric addresses "the whole man," who participates tacitly in meanings shared by his fellows, whose acts are informed by his passions and purposes, not by logic alone. The presumption is that man is different qualitatively from other animals, still more different from mute, insensate things and as Henry Johnstone[8] among others has argued, that his difference lies not in an ability to transmit and store information, but in his freedom to persuade and be persuaded.

Perhaps the notion of man as persuader returns us to a concept of man as agent; certainly my next feature does. Theorists have pointed out that man faces problems; he addresses situations which are problematic because inherent in them is no logically or empirically compelling resolution. Bryant has said,

> Rhetoric . . . is the method, the strategy, the organon of the principles for deciding best the undecidable questions, for arriving at solutions of the unsolvable problems, for instituting method in those vital phases of human activity where no method is inherent in the total subject matter of decision.

Bryant has phrased it memorably, but he would not claim originality for the thought. Aristotle insists, "The duty of rhetoric is to deal with such matters as we deliberate upon without arts or systems to guide us" (Rh, 1357[a]) and Isocrates calls it the faculty with which "we both contend against others on matters which are open to dispute and seek light for ourselves on things which are unknown" (Antidosis, 256). Rhetoric presumes that man, faced with problems, acts as inquirer, and that even if the fruits of his inquiry cannot be apodictic, it makes sense for him to inquire. Without such a presumption, for example, it would be mere flummery for Aristotle to say that though rhetoric argues opposites, it "is useful because things that are true and things that are just have a natural tendency to prevail over their opposites" (Rh, 1355[a]). Rhetoric presumes that a middle ground exists between conclusions proved absolutely and capricious positions assumed arbitrarily. The province of opinion, rhetoric presumes that not all opinions are equally reasonable and that it thus makes sense to debate opinions, even though such debate cannot conclude in certainty.

Rhetoric presumes that man is agent, that he acts on the basis of values as well as facts, that his past informs his present actions, that the whole man — not just the faculty of logic -- acts and is moved to action, that the speaker and his fellows embody and share meanings that are not articulated, and that though he risks failures of various sorts it makes sense for him to engage in acts of inquiry when faced with problematic situations, to take action in the absence of conclusive evidence or logic.

It seems to me that these are features undergirding rhetorical theories generally, among those which form the foundation for any rhetoric which aspires to be responsible. They are characteristics on whose basis any rhetorical theory, whether classical or contemporary, can be a theory of more than mere manipulation.

Turning specifically to the study of rhetoric in the contemporary world, it too has some characteristics we should briefly remark. The first is the quality of interest which rhetoric now excites.[10] Though we find the breadth of that interest sometimes baffling, even embarrassing, many of us also are finding the study of rhetoric to be profoundly evocative. Think of the number of scholars who have moved to rhetoric from study in some other field. Perelman is the clearest example, though not the only one. But you and I are my most accessible evidence for the point I am now suggesting. A century ago, we would not have been at a meeting of this sort. More likely, if we had considered rhetoric at all, we would have thought of it as some antiquated discipline, a classical curiosity, to be stored away with other artifacts of a pre-scientific age. Today, we suspect that that may not be the whole story, that there may be latent in rhetorical insights a wisdom which we are working to recover. It may be that rhetoric's hour is come round at last, an idea we are laboring to see reborn.

If so, I would suggest that one of our motives is the image of man I have sketched, based on man's capability for action, action's irreducibility to mere motion, and therefore granting force to such concepts as dignity, freedom, and responsibility. The image, in a word, is humanistic. Perelman, for example, speaks of our need for a philosophy which would "integrate into its structure the processes of argumentation utilized in every domain of human culture" and

goes on to say, "A renewal of rhetoric would conform to the humanist aspect of the aspirations of our age."[11] Henry Johnstone sees rhetorical acts as constitutive of self.[12] Weaver calls rhetoric "the most humanistic of all the disciplines[13] and complains in the same paragraph that contemporary culture "has no adequate theory of man." Perhaps one of our ambitions in studying rhetoric is to recover some sense of the human image which informs it.

Another, equally ambitious, characteristic of contemporary rhetoric is the scope it seems to assume. Under Ehninger's definition of rhetoric as "the rationale of symbolic inducement,"[14] it is difficult to see how any statement could escape its purview. Kenneth Burke's definition renders rhetoric coextensive with meaning.[15] Perelman sees man as "an essentially rhetorical animal."[16] All three would seem to agree with Weaver, who claims, "Men are born rhetoricians . . . . Rhetoric is cognate with language."[17] Robert Oliver says, "Philosophy itself is a form of rhetoric."[18] And Wayne Booth acknowledges, "Every statement is in some sense rhetorical."[19] Given our emerging understanding of rhetoric, it is difficult to see how any statement can be exempt from its scope.

But that brings me to the last characteristic of contemporary rhetoric to be mentioned, actually a problem which provides important motivation for this paper. Rhetoricians argue that all statements are rhetorical, yet they also often assume that statements claiming scientific status are in no way rhetorical. Rhetorical statements are informed by values as well as facts, but Marie H. Nichols speaks of the "facts alone,"[20] presumably uneffected by valuations, which science offers. Rhetoric properly encompasses three modes of proof, but science is presumably limited to impersonal logic (and equally impersonal observation) alone. Thus Perelman at times feels that formal logic

is a counterpart to rhetorical argumentation;[21] the two are mutually exclusive. Of course, it is difficult to mention Perelman without mentioning his "universal audience," of which scientists would presumably be one manifestation.[22] Thus the notion of "audience" itself would presumably place science under the aegis of rhetoric, but on this point Perelman instructively equivocates, as can be efficiently seen: "maximally efficacious rhetoric, in the case of a universal audience, is rhetoric employing nothing but logical proof,"[23] he says, but he continues, "It is always hazardous . . . to identify with logic the argumentation intended for the universal audience."[24] Weaver agrees that science, unlike rhetoric, is restricted to logic alone: "The method of scientific investigation," he says, "is . . . merely the method of logic."[25] Unlike the rhetorician, Weaver says the scientist "has to demonstrate every proposition in his argument";[26] science presumably is restricted to the apodictic. It presumably gives us incontrovertible knowledge, since its method is apodictic logic and since the scientist's observations are themselves incontrovertible; he observes things "that just anybody could identify, like an elephant in a parade."[27] Since his methods are certain and his arguments demonstrative, since therefore he risks no error, unlike the rhetor the scientist can never properly base his work or his argument on appeals to authority, a point made by both Weaver[28] and Perelman.[29] Perelman's equivocation aside, presumably the same reason the scientist does not need an audience either; Lloyd Bitzer claims, "The scientist can produce a discourse expressive or generative of knowledge without engaging another mind."[30] Perelman seems to agree:

> Contrary to what happens in science, where all that is necessary for the solution of a problem is knowledge of the techniques that enable the solution to be reached, interference in a controversy whose outcome will affect a specific group may be made only by one who is a member of, or otherwise closely bound up with, the group in question.[31]

For Weaver, all language is sermonic." Commenting on Weaver, Paul Campbell has said that language in use is never "neutral, or impersonal, or objective."[32] Thus scientific discourse is presumably a sort of rhetoric. Yet Weaver also is capable of saying that science and dialectic "are both rational and they are both neutral."[33] He says, "Rhetorical presentation always carries perspective. The scientific inquirer, on the other hand, is merely noting things as they exist in empirical conjunction."[34]

The problem I am suggesting should be in sufficient focus now to warrant a general formulation: All discourse is rhetorical, we claim, yet we often tend to embrace an understanding of scientific discourse which excludes it from the realm of rhetoric. Furthermore, it is not the case that these opposed attitudes characterize opposed factions within our discipline. Instead, as my citations have suggested, both attitudes are held by the same men, many of whom are among the most influential figures in our field.

In some respects, the problem is both understandable and peripheral. If rhetoric encompasses all, it is understandable that in a world immeasurably more complex than Cicero's we do not claim the universal knowledge Crassus exhorts us to. It is understandable that as a discipline we have not intensively studied the philosophy of science, for instance. Perhaps, too, in an age of relativism and skepticism we do not wish to relegate to rhetoric what little still seems certain, and certainly seems for us to be bound up with science. That, too, is understandable, though it seems to assume that a rhetorical argument is one which anybody is free to disbelieve, and we may need to re-examine that assumption. The problem is peripheral, too, in that its solution conceivably might not affect at all the ways we conduct our classes or our other work as rhetoricians. Furthermore, it is a peripheral issue in a literal

way: doubtless one of our motives in so characterizing science is to delimit rhetoric, to give our discipline some boundary.

In other ways, however, the problem is an absolutely fundamental one, for our discipline and for our selves. One consideration is that in our age science is the most persuasive stuff around. We need think only of the white-coated "scientist" in the latest patent-medicine ad or of our thoughtful students' attitudes, when they come to us humanists after having left classes in the natural or social sciences. Really, we need think only of ourselves; in ways we have seen, even rhetoricians are moved by the prevailing scientific ethos. Surely it is no exaggeration to say that some forms of scientific discourse generate especially pervasive and powerful forces of persuasion today. If we neglect to study the philosophic assumptions underlying them, we are neglecting an especially vital aspect of our own field.

But there is deeper reason for this to be an absolutely fundamental problem for us. The conception of science we tend to hold turns out to be in effect though doubtless not in intention utterly inimical to such features as the ones I earlier characterized, features which I believe underlie any responsible theory of rhetoric. To see clearly, though briefly, why such a view of science simply will not do, as far as rhetoric is concerned, I need to summarize and somewhat extend the view of science we have heard our colleagues suggesting. The view I shall sketch is perhaps not one which any responsible person -- certainly any rhetorician -- would wish to hold. If the sketch sounds at times like caricature, I can only cite the summary form my argument must take and say that I am working out some apparently inescapable extensions of this view of science.

Science, in this view, is a matter of "the facts alone." Significant statements are either definitions or reports of sensation; considerations of value, for instance, are neither; literally "non-sensical," they really are meaningless. Thus this view has no place for value statements or indeed for evaluations of any sort. Its methods are a matter of objective observation and impersonal, often mathematicized logic. Its statements are thoroughly rigorous, exact, and explicit, either self-evidently true or demonstrably based on incontrovertible observations. In the voice of the early Wittgenstein it insists, "What can be said at all can be said clearly, and what we cannot talk about we must consign to silence."[35] The knowledge it offers is wholly formalized and testable. It insists that what can be doubted must not be believed and must certainly not be embraced as a basis for any claim to knowledge. Rigorously defined and objectively observed facts alone are to be countenanced; the scientist is the passive accumulator of such facts. Through trial and error he arrives at theories, merely convenient fictions which help him catalog his facts. If facts ever turn up which do not fit his theories, those theories will have been tried and found in error; they must be immediately abandoned and theories which catalog more efficiently must be found. Since its aim is to give knowledge which is incontrovertible, science has no use for beliefs embodied in a tradition and the scientist can properly make no appeal to authority — his own, his co-workers', or their predecessors'. Since his methodology generates demonstrative knowledge, the scientist may choose to share his findings with an audience, but he has no need of an audience to judge his findings. This view of science, as I have broadly sketched it, has had many eminent advocates. It is a stance labelled as positivism or objectivism, the term which Polanyi often uses and which I will adopt in subsequent discussion. It is a view of science whose general truth has long been assumed in

the West, one which may still seem unquestionable to a few philosophers of science, some scientists and many laymen, rhetoricians among them.

This objectivist view of science seems utterly reasonable, yet the methodology it endorses is radically at variance with the methods the rhetorical tradition consistently has advocated. At the risk of repetition, I need to mention a few illustrative differences: the rhetor addresses problems which demand attention, problems which exist because available evidence and logic do not entail a single clear and demonstrative resolution; he speaks, though given the nature of the situation he cannot speak clearly. The rhetor is advocate rather than impassive observer; it would be unthinkable for him to abandon his position in light of some bit of evidence which apparently conflicts with his case; indeed the existence of conflicting evidence, we might say, is what calls the rhetor into play. The rhetorical tradition encourages him to draw on value as well as fact. He appeals in terms of ethos and pathos, not in terms of logic alone. His arguments are not rigorous or exact; they always risk being mistaken. Neither are they wholly explicit; they are based instead on shared and often unspoken beliefs or traditions. His methods imply that some meanings are tacit. The objectivist's stance leads him to the position that demonstrable knowledge is all, and that beyond the boundaries of knowledge all that exists are equally arbitrary opinions. As one objectivist has candidly put it, "the opinion of the wise man is on a par with that of the ignoramus."[36] Such a position obviously banishes ethos. More fundamentally, it implicitly denies that it makes sense to debate opinions, thus denying a presumption which a responsible rhetoric must surely hold.

Should rhetors and theorists abandon the methodologies advocated since Aristotle, in favor of those radically more restricted ones embedded in an

objectivist view of science? Even presuming we do not abandon the more loosely defined and wide ranging methods advanced in the rhetorical tradition, should objectivist science be accepted as the norm for rhetorical processes? It may seem utterly unreasonable not to; yet as we have seen, much of that proffered norm would lead us to discount features which have always been central to the rhetorical tradition. Any reasonable answers to these questions must be much more complicated than the questions themselves, and I will not offer any, directly. I point up the questions to focus some serious issues arising from our assumptions about science and about our own discipline, assumptions at such variance that an objectivist view of science and a responsible view of rhetoric may have difficulty living in the same world or the same mind. I believe that such questions as these inform the instructive ambivalence which it seems to me that twentieth-century rhetoricians often betray toward their own discipline.

Even if we could leave aside methodological issues, there is another fundamental issue facing us, having to do with some subject matter viewed through objectivist methodology, when the subject is man.

The rigor and explicitness which are apparent characteristics of objectivist method mean that only what appears countable is accorded status as reality. Walter Ong develops this thesis with regard to the "empirical" schools of associational psychology;[37] W. J. Bate argues, "Cartesian mathematicism eventually had to discard as unknowable -- and therefore, since the mathematical reason is infallible, as nonexistent -- all except the mechanical itself."[38] When objectivism turns its attention to man, such works as LaMettrie's L'Homme Machine shows that it sees man as a mechanical device. Machines have no room for contingencies. The contingent, which is an essential

element in Aristotle's thought and specifically in his rhetoric, is now seen as mere illusion. Machines are not open to argument. That was seen with characteristic incisiveness, by Dr. Johnson: "If a man would rather be a machine, I cannot argue with him," he said.[39]

Many people, perhaps including even some rhetoricians, would be willing to forego the wars of words, if that were all that is at stake here. But it is not. Bertrand Russell illustrates the point nicely:

> Cartesianism was rigidly deterministic. Living organisms, just as much as dead matter, were governed by the laws of physics; there was no longer need, as in the Aristotelian philosophy, of an entelechy or soul to explain the growth of organisms and the movements of animals.[40]

All is rigidly determined; choice and action are merely illusion. Humans, like any other machines, do not act; they are moved. Objectivism insists that apparent "actions" in response to "choices" are merely movements by a type of machine whose causal factors and operational principles we as yet imperfectly understand. Really, choice is an illusion. In a world where neither organic self nor act is real, it is doubly nonsensical to think of rhetorical acts constituting the self. Neither "risk" nor "commitment" can have any reality. If acts are illusory, <u>interactions</u> must be also. To believe that persons, through discourse, might constitute communities and create social harmonies is a dangerous illusion -- as dangerous, perhaps, as the illusions of "freedom and dignity" which humans superstitiously persist in holding. Instead, social cohesiveness is to be gained by the control of behavior. Or, only a bit more precisely, it is to be gained by manipulation of envoronmental factors which control behavior. Anything more than manipulation is literally unthinkable. Manipulation, not interaction, is real; we might as well face that fact and make the most of it. In brief, the notion of man as agent, which was

central to ancient rhetoric and which I have suggested as one motivation for rhetoric's contemporary rebirth, that notion under an objectivist view is seen as simply nonsense. Objectivism, begun in a laudable attempt to purge error and undergird epistemic claims, in effect undermines features absolutely central to a responsible rhetoric.

Despite their often objectivist views of what science is, rhetoricians have been uneasy in light of objectivism's disastrous implications for rhetoric and for the image of man which rhetoric embraces. Perelman has instructively inveighed against the objectivist restriction of the rational to the demonstrable, and both he and others have mentioned often if in passing Perelman's movement from "positivism" to rhetoric,[41] a journey he may not have yet completed. Henry Johnstone sees himself moving away from a view which "had much in common with the Cartesianism it attacked."[42] Lawrence Rosenfield argues against "logical positivism and Skinnerian psychology, both of which deny man's 'experiential capacities' and limit their notion of man to that of an automaton consisting of a network of observable behaviors."[43] Ralph Eubanks argues, "In the world of semantic positivism there are no rhetorical issues."[44] Richard Weaver sees that rhetoric will never be eliminated.[45] But he sees the danger that objectivist conceptions will persuade contemporary man:

> For what man tells himself he is manifests itself soon enough in what he does and may even predetermine what he can do . . . . The imminence of . . . a dark night of the mind is the subject of this essay . . . . Man is being told by the representatives of that body of knowledge which today enjoys the most prestige that he is not free.[46]

Weaver says elsewhere, "The word is almost in limbo, where the positivists have wished to consign it."[47] Under the objectivist image, Weaver sees, "The modern mind is trying to surrender its constitutive powers to the

objective physical world."[48] Such a surrender entails the "denial of standards, and ultimately of knowledge, which lies at the source of our degradation."[49] Weaver calls for "a more complete epistemology"[50] than the objectivist one, which denies the validity of rhetorical methodologies and denies the existence of rhetorical beings. Contemporary rhetoricians' equivocations concerning the nature of knowledge and of science are instructive; they help show the complexity of the problems being raised here and the difficulty of adequately addressing those problems in a culture pervaded by objectivist conceptions, which in effect are inimical to any theory of a responsible rhetoric.

If we have found the objectivist conceptions simply will not do in the realm of rhetoric, it is part of Michael Polanyi's achievement to show that they can have disastrous consequences in the realm of science. Polanyi's achievement ranges beyond that critical task; though "rhetoric" is not one of Polanyi's professional concerns and is an item which appears only rarely in his vocabulary, Polanyi is also articulating an image of science, I believe a viable one, which you and I would consider thoroughly rhetorical.

In the remainder of this paper I will sketch some arguments through which Polanyi discovers serious difficulties in objectivist formulations, and I will suggest the alternative conceptions he offers, conceptions originally grounded in his understanding of scientific communities. I will trace his conception of scientific communities, a conception both chronologically prior to and conceptually coherent with the epistemology he has since developed. There will not be space to consider his epistemology itself in any detail, though most commentators consider that to be Polanyi's most important achievement. In this paper there will be space only for the claim that Polanyi's thought is

deeply coherent with features undergirding rhetorical theory, a claim which should provide grounding for the subsequent claim, which must be developed elsewhere, that Polanyi's epistemology offers a viable foundation for rhetoric, a foundation denied it by objectivist formulations in ways I am suggesting.

Michael Polanyi did not set out to become a professional philosopher; he was a medical doctor, then a remarkably fruitful research chemist, before being called to philosophic issues by a deeply felt cultural exigence. Those circumstances doubtless qualify Polanyi as a rhetor, but I am unconcerned in this paper with executing rhetorical criticism on his work or with explicating in great detail the rhetorical criticism Polanyi in effect offers of his adversaries' positions, beyond suggesting that Polanyi's work itself shows that rhetorical criticism needs to be a deeply searching activity.

Polanyi, working then as a research chemist, fled Germany after Naziism came to power. He fled to England, where he still resides and where, in the 1930's and '40's, he found efforts under way to "plan" the direction of future scientific endeavors, shaping them in directions deemed to be socially or materially useful. These efforts, informed by the Marxist attempts of the time to shape the directions of scientific work, Polanyi resolutely and successfully opposed. The example of Marxist ideology was to become emblematic for Polanyi of the exigence which called him to philosophical issues.

The exigence Polanyi perceives is a matter of essentially ideological threats to the pursuit of knowledge for its own sake, to free thought in general and to the autonomy of scientific inquiry in particular. Armed only with objectivist formulations, when faced with ideological threats the liberal

mind can only "stagger and fumble" (PK, p. 228);[51] objectivism offers no defense for the autonomy of thought anywhere, even in the sciences. In fact, contemporary ideological threats to science ironically derive their persuasive force from objectivist conceptions of what science is:

> I first met questions of philosophy when I came up against the Soviet ideology under Stalin which denied justification to the pursuit of science . . . . I was struck by the fact that this denial of the very existence of independent scientific thought came from a socialist theory which derived its tremendous persuasive power from its claim to scientific certainty. The scientific outlook appeared to have produced a mechanical conception of man and history in which there was no place for science itself. (TD, p. 3)

We must briefly see how, according to Polanyi, it could be that objectivism, intended to undergird science, could come instead to afford persuasive power to ideologies which undermine scientific activities.

Western man's increasing passion for objectivity, essentially a passion to perfect his knowledge, has led him to view an increasing range of subjects through objectivist spectacles, until now it is widely persumed that persons and societies themselves ought to be studied "objectively." Through the spectacles of "objectivity," however, there are some things which simply cannot be seen. In particular, the "criteria of objectivity must deny reality to any moral claims" (K & B, p. 46). Thus, for example, "Justice, morality, custom and law now appear as mere sets of conventions charged with emotional approval" (LL, p. 8). Contemporary ideologies substitute appetitive terms -- terms of power, economic interest, selfish desire (See LL, p. 5) -- for terms of moral motivation, since genuine moral motivation is now presumed not to exist (See PK, p. 234). Any individual or institution claiming to be acting on moral grounds is seen to be engaging in self-deception or, more likely, hypocrisy, and is bitterly denounced.

But that denunciation would not be made if the objectivist view of morality were an accurate one, for such denunciation is itself grounded in moral passions. Thus nihilists, in Polanyi's analysis, are "strict materialists, who combine their total denial of genuinely moral ideals with a frenzied hatred of society on account of its immorality" (K & B, p. 15). Naziism provides another illustration. Though "The Nazi disbelieve[d] in public morality" (LL, p. 106), the Nazi leaders had "a strong feeling of [their] own moral superiority over the moralizing statesmen of other countries" (K & B, p. 9). Under the demand for boundless honesty, "Violence alone is still honest, but only gratuitous violence is authentic action"(PK, p. 236). Having suffered an inversion of standards, the only valid sign of morality is taken to be immersion in immoral action.

Important to Polanyi's analysis is his conviction that man embodies moral passions, though they are denied by the objectivist and though, unacknowledged, they are subject to terrible perversion. Such "homeless" moral passions and objectivism, though contradictory principles, mutually reinforce each other, in modern ideologies. Increasingly ruthless insistence on objectivity drives moral passions even further underground, where they encourage us to increasingly boundless aspirations. At the same time, moral passions inform the very objectivism which with increasing insistence denies their existence. Perfectionism in knowledge and perfectionism in morals breed each other; the confluence of these two contradictory principles is highly volatile, and it can be ruthless.

And this confluence is tremendously persuasive to the modern mind; its contradictory elements jointly provide the convincing power characteristic of contemporary ideologies: "The more inordinate our moral aspirations and the more completely amoral our objectivist outlook, the more powerful is a

combination in which these contradictory principles mutually reinforce each other" (PK, p. 228). Thus Marxism, Polanyi's most abiding target, "accuses all moral sentiments of hypocrisy, while the moral indignation which the [Marxist] thus expresses is safely disguised as a scientific statement" (PK, p. 233). Contemporary ideologies' persuasive force derives from their claimed scientific status, when coupled with their unspoken moral passion:

> Alleged scientific assertions, which are accepted as such because they satisfy moral passions, will excite these passions further, and thus lend increased convincing power to the scientific affirmations in question -- and so on, indefinitely. Moreover, such a dynamo -- objective coupling is also potent in its own defense. Any criticism of its scientific part is rebutted by the moral passions behind it, while any moral objections to it are coldly brushed aside by invoking the inexorable verdit of its scientific findings (PK, p. 230).

Marxist ideology gathers its persuasive power from the contradictory principles -- boundless moral aspirations, rendered covert by an objectivism which denies the existence of morality. Marxist ideology carries "such supreme convincing power [because] . . . . it enables the modern mind, tortured by moral self-doubt, to indulge its moral passions in terms which also satisfy its passion for ruthless objectivity" (PK, p. 228). Polanyi promises the rhetorical critic important insights, I believe, as he sketches how mutually contradictory positions, simultaneously embraced, can jointly offer persuasive efficacy. He may help us deal, for instance, with scientistic arguments, and perhaps he offers us a way to understand the dynamics of those inversions which drowned an American administration in Watergate.

Polanyi sees culture as an unexpressibly delicate organism; and he sees science as one dimension of the more general culture (LL, p. 7), prey to the same forces which undermine cultural institutions and traditions in general. Polanyi's analysis of ideology shows how the logic implicit in objectivism can

be finally destructive of free scientific inquiry and how the objectivist who would defend the autonomy of science is rendered impotent by his notion of what science is. Though my discussion here must be brief and therfore fairly... theoretical, both Polanyi's writings and the last decades of history in the Soviet Union and elsewhere show that the issue is not merely a theoretical one.

Recall that under objectivist analysis, man's movements are determined by his innate, essentially selfish, appetites and by environmental factors over which he has no control. Unfortunately, there is no way to exempt the scientist from this analysis. Even statements of fact are dissolved into declarations of purpose (See RK, pp. 240, 242). Past scientific advances are read as solutions motivated by practical, essentially technological, problems. If the scientist claims independence of inquiry he must be denounced as self-deluded or hypocritical: "To claim independent status for pure science [is] ridiculed as mere snobbery" (PK, p. 238); since objectivism has "denied altogether any intrinsic power to thought and thus denied also any grounds for claiming freedom of thought" (TD, pp. 3-4). In terms that we have already heard suggested by Richard Weaver, the logic of objectivism entails the "self-destruction of the human mind" (PK, p. 240).

To come at essentially the same analysis from a somewhat different point of view, recall that for the objectivist there exists no middle ground between the absolute and the arbitrary — the absolute character of data and demonstrable knowledge and the arbitrary character of any other claims. If the scientist is who the objectivist says he is, if he is the impersonal and objective observer, collector, and codifier of data, what he observes, collects, and codifies should be a matter that is essentially arbitrary (LL, p. 49). If the choice

of a problem is arbitrary, it should not matter who chooses a problem for scientists to tackle. The same moral passion for perfection, which informs the objectivist ideal of knowledge in the first place, also seeks the improvement of man's life. Since scientists are in any case arbitrary in their choice of problems, they should address themselves to problems whose solutions would promise practical, social benefit. The direction of scientific work is no longer a matter to be determined by scientists; it becomes a matter for political rulers instead. Science thus sacrifices its autonomy to a superior authority, an authority which judges which problems scientists should address, grants or withholds support for scientists and, in effect, judges their findings.

If science were what the objectivist says it is, this would be the most beneficial way for science to proceed. But it is not. In abrogating the autonomy of scientific activity, this rationale in effect threatens the existence of science, as bizarre pogroms against scientific communities in Communist countries most clearly have shown.[52]

Science is not what the objectivist believes it to be. It is instead a consentual activity, carried on within a self-accredited and self-governing community. Any movement which in effect threatens its consentual basis or the communal framework within which consent is achieved — including any philosophy of science which does that — poses a dangerous if unintended threat to scientific activity itself. What follows is the view Polanyi offers of an individual's initiation into a scientific community and some relevant functions such communities serve. The sketch implies some serious inadequacies in objectivism's ideal and it foreshadows the shape of Polanyi's own epistemology. The sketch

doubtless will seem largely commonplace; what is striking is its incoherence with the objectivist ideal and its resulting implication that the ideal is mistaken.

The facts relevant to a scientific discipline are by no means self-evident; they are not at all things that "just anybody" could see. Indeed, the candidate must learn to see in certain ways, ways which characterize his discipline: "different branches of science are based on different ways of seeing."[53] The mark of scientific ability is the "gift of seeing things where others see nothing" (K & B, p. 107).

Furthermore, the candidate must strive to see matters which no explicit description can ever demonstrate to him; the aspiring biologist, for example, must learn to distinguish specimens which, after explicit description, still seem identical to his untrained eye. Far from simply learning the explicit formulae, theories, and rigorous methodology currently existing in his discipline, the aspirant commits himself to an education that could not be conveyed by any textbook. He is learning an art, and "Since an art cannot be precisely defined, it can be transmitted only by examples of the practice which embodies it" (SFS, p. 15). The aspirant serves an apprenticeship, imitating and being guided by men already accredited as authorities in the discipline. Contrary to what a self-consistent objectivism would say, the apprentice's role is not to doubt and replicate what his science offers — he obviously has not world enough, time, or competence to do that. Instead, the guided laboratory work essential to his education enables him to assimilate a-critically what his science offers him and no text could ever teach him. "Each such acceptance appears . . . as a submission to a vast range of [past] value judgments exercised over all the domains of science, which the newly accepted citizen of

science hence forth endorses, although he knows hardly anything about their subject-matter" (K & B, p. 66). The aspirant accepts as generally true, and as a reliable guide to further truths, the achievements of his own field and of other scientific fields on which his own is partly dependent; he comes, in short, to inhabit the tradition which his field embodies, a set of shared beliefs and ways of looking at the world that are largely unspoken. Having learned to understand and to speak the language of his discipline, the initiate's voice is accredited the authority appropriate to a member of the field, an accreditation which can be given only by men who already are members of the community which the aspirant is striving to join.

I have said that the candidate must learn to see, in new ways that textbooks, lectures and formulae can never directly show him. If he is at all imaginative and therefore holds promise of making future discoveries, through his training the candidate will have achieved another sort of vision as well, a vision much less specifiable than even the sorts of sight I have mentioned, yet one which is shared by the most fruitful members of the community: thoroughly embodying as a matter of tradition and belief the past achievements of his community, the scientist's vision extends to what exist in his field as problems yet to be solved, discoveries yet to be made.

I have said that the scientist assimilates to himself the past achievements of his field as a generally reliable guide to reality. But if that framework were utterly reliable, it would leave no relevant problems unresolved. "Discoveries are made by pursuing possibilities suggested by existing knowledge" (TD, p. 67). Existing scientific traditions are indispensable in pointing toward a problem and providing clues to its solution's

discovery, but a problem is a problem precisely because it defies existing formulations; that is what it means to call something a problem. A scientific problem, a "gap within a constellation of clues pointing toward something unknown" (K & B, p. 171), can be perceived and addressed by a qualified scientist, who dwells so thoroughly within the assimilated achievements and tradition of his discipline that they provide clues to the problem's shape, though they never formally entail its solution.

To attempt discovery is to engage in exhausting and impassioned striving, in which the scientist is informed by the traditional insights and criteria of his discipline. But because existing formulations leave the problem unresolved, he must seek beyond them, establishing his own criteria and setting his own standards:

> He is himself the ultimate judge of what he accepts as true. His brain labours to satisfy its own demands according to criteria applied by its own judgment. . . . The scientist appears acting here as detective, policeman, judge, and jury all rolled into one. He apprehends certain clues as suspect; formulates the charge and examines the evidence both for and against it, admitting or rejecting such parts of it as he thinks fit, and finally pronounces judgment. While all the time, far from being neutral at heart, he is himself passionately interested in the outcome of the procedure. He must be, for otherwise he will never discover a problem at all and certainly not advance towards its solution. (SFS, pp. 38-39).

In the interest of achieving a discovery, a deeper understanding of what is really there, the scientist must set his own standards, but that obviously does not mean that he acts whimsically. Instead, he acknowledges these standards' "jurisdiction over himself" (PK, p. 303); with "universal intent," he believes these standards ought to be followed by anyone seeking the discovery his problem intimates. Just as a "judge's discretion is . . . narrowed down to zero by the strangle hold of his own universal intent"(PK, p.309),

the scientist's "compulsion by universal intent establishes responsibility. . . . The freedom of the subjective person to do as he pleases is overruled by the freedom of the responsible person to act as he must" (PK, p. 309).

Inquiry represents the scientist's operations in areas for which no adequate rules yet exist. Discovery is the scientist's leap of the heuristic gap, unbridgable by formal operations, which separates problem from discovery. He finds that existing formulations, which pointed toward the problem, are now irreversibly altered, in light of the discovery he believes himself to have made:

> A problem that I have once solved can no longer puzzle me. . . . Having made a discovery, I shall never see the world again as before. My eyes have become different; I have made myself into a person seeing and thinking differently. I have crossed a gap, the heuristic gap which lies between problem and discovery (PK, p. 143).

The inquirer risks wasting the time and effort he devotes to a problem; as we have just seen, he risks changing himself, in light of his discovery. Given the necessarily hazardous nature of his enterprise, he also risks being mistaken concerning the discovery he believes he has made. But having convinced himself of his discovery, the scientist now finds his heuristic passion transformed into a persuasive one; he seeks an audience of his peers, as he finds himself called to persuade them to share his new conviction.

However, as accreditation procedures suggest, any community of scientists has a vested and justified interest in ignoring rogues and fools; to abandon existing beliefs in light of each proferred discovery or bit of apparently conflicting evidence would only guarantee that a discipline would lose the direction of its development, wasting itself instead in a chaos of presumed findings. Scientists therefore properly neglect a great deal which seems to

conflict with theories they believe to be true. In the case of Velikovsky, for instance, "Authority prevailed against facts" (K & B, p. 76). The discoverer's credentials create the presumption that he is worthy to be heard, but even his reputation does not guarantee a hearing for his findings. Instead, a community of scientists will establish for its societies and journals some members as referees, who evaluate proferred contributions and refuse publication to outlandish claims, often without comment, certainly without conclusive proof that the claims are mistaken, an enterprise for which no referee would have time, inclination, or ability: "The whole machinery of scientific institution, is engaged in suppressing apparent evidence as unsound, on the ground that it contradicts the currently accepted view about the nature of things" (K &B, p. 66).

This is not to say, of course, that any scientific community seeks the unaltered perpetuation of its own tradition, accepting as worthy contributions only essentially routine surveys which conform to views already held. Instead, the tradition's very life depends on its renewal by continuing modification. Thus, "The same scientific authorities pay their highest homage to discoveries which deeply modify the accepted view of the nature of things" (K & B, p. 66). Referees' judgments of a contribution's plausibility are balanced against their judgments of its originality, the extent to which it seems successfully to address a genuine problem in the field.

If granted an audience, the scientist seeks to persuade his peers to his new conviction. His appeal, like his inquiry, will be rooted in the tacitly shared beliefs, the common tradition, which renders his discovery plausible to his fellows; he appeals implicitly to "tradition as the common ground between himself and his opponents" (SFS, p. 52). However, a further implication of the nature of problems is that he cannot persuade his fellows of his discovery by the impersonal inferences of some strictly formal logic.

"To the extent to which [a discovery] represents a new way of reasoning, we cannot convince others of it by formal argument, for so long as we argue within their framework, we can never induce them to abandon it" (PK, p. 151). He cannot appeal without reservation to the tradition which other scientists still hold and which he himself still largely shares, a body of opinion which had pointed to the problem but left it problematic. He "will always meet any opposition of scientific opinion as it is by appealing against it to scientific opinion as he thinks it ought to be" (SFS, p. 52). "It is part of his commission to revise and renew by pioneer achievements the very standards by which his work is to be judged" (LL, p. 50).

The discoverer, as advocate for his discovery, finds himself attempting to persuade his fellows across a logical gap analogous to the one which had separated his problem from his discovery of its solution:

> Like the heuristic passion from which it flows, the persuasive passion too finds itself facing a logical gap. To the extent to which a discoverer has committed himself to a new vision of reality, he has separated himself from others who still think on the old lines. His persuasive passion spurs him now to cross this gap by converting everybody to his way of seeing things, even as his heuristic passion has spurred him to cross the heuristic gap which separated him from discovery (PK, p. 150; cf. p. 172).

As advocate, the scientist risks an especially precious attribute, his reputation. His audience also risks wasting time, being misled, and converting themselves to a new view. "Those who listen sympathetically will discover for themselves what they would otherwise never have understood. Such an acceptance is a heuristic process, a self-modifying act, and to this extent a conversion" (PK, p. 151). Acting as audience, "The scientist must decide . . . issues, left open by opposing arguments, in the light of his own scientific conscience" (SFS, p. 15). What is more, the community of scientists, the embodiment of scientific tradition, must make such decisions "about the merits

of a discovery [while] its future repercussions are still unknown" (PK, p. 148), including those repercussions which may eventually be known as "verification" of the discovery. The community must decide the merits of proferred statements before much relevant evidence is in, partly so that evidence relevant to proferred discoveries may be uncovered.

A community of scientists, in short, is always making decisions and and undertaking commitments on the basis of evidence which is in no way compelling, informed by a tradition which exists in the interest of its own renewal, a set of sophisticated but to some extent unarticulated beliefs commonly shared within the community. Its operations imply a middle ground between the absolute and the arbitrary. Without such processes, "science could not operate at all" (LL, p. 13).

The first conclusion to be seen from Polanyi's analysis of scientific communities is that science itself does not operate in accordance with the objectivist ideal. It simply is not true that science is an impersonal collecting of rigorously defined facts, carried out under a set of explicit and inflexible rules which eliminate all evaluations, all claims that are not tested, and all appeals to tradition, authority, and belief. It is misguided to believe that scientists accept past scientific achievements only tentatively and that they subject those achievements to continual testing, striving for their falsification.[54] It is not true that a relevant scientific fact is observable by anyone, and it is doubly untrue that a promising scientific problem can be set by anyone and that it should therefore be set by those non-scientists who have society's practical needs most clearly in mind. The objectivist ideal gives a picture of science which is distorted at best;

undercutting the autonomy of science, this ideal, "having first exalted science to the seat of universal arbitrament, now threatens to overthrow and destroy it" (LL, p. 9).

Under the objectivist view, Polanyi's analysis of scientific operations would produce only the cynical and destructive conclusion that even science fails to live up to what it ought to be. Polanyi's own position is profoundly different: his analysis gives no reason for cynicism; it instead shows that the objectivist ideal is itself mistaken.

Science is a much more subtle and complex activity than the objectivist ideal allows. It is a consentual activity, carried on within a self-accredited community of qualified peers, and characterized by features which objectivism would disallow, including features which undergird any theory of rhetoric. The initiate to any community of science commits himself to a vision he cannot totally articulate, one whose truth he certainly is unable rigorously to demonstrate. Risking the possibility that his commitment is mistaken, he nonetheless embraces the past achievements of his science, accepting them as authoritative and as generally reliable guides to further truths; discoveries in any field are open only to those who most thoroughly have embodied the knowledge existing in that field. As inquirer, the scientist risks himself in passionate striving, continually making evaluations whose grounds he cannot exhaustively specify, relying generally on the tradition he represents but setting to himself the standards he believes he must set, in light of the problem he addresses. Believing himself to have achieved a discovery, the scientist as advocate seeks, on the basis of his own authority and the beliefs he still shares with his peers, to persuade them to a view he cannot prove to them, to the new standards required in light of his view. Like

scientific problems, which must be set within a community of scientists, "the logical antecedents of science are internal to science" (PK, p. 171). Other scientists, acting as audience, must decide whether to reject or commit themselves to the proferred discovery and the revised standards it implies. They must make that decision on the basis of beliefs they share but cannot exhaustively articulate or prove, at a time when anything approaching demonstrable proof of the discovery is yet unavailable.

Features central to Polanyi's analysis are also ones which I have argued underlie theories of rhetoric: Scientists are agents, and their actions are informed by values, not just by facts. Their strivings are characterized by passions and acceptance of their own and each other's authority, not by an impersonal logic alone. Informed by a common tradition, they share tacitly held beliefs, on whose basis they argue and which they revise in light of new insights. And they actively inquire, committing themselves to the fruits of their inquiries, though given the nature of inquiry there can be no rules guaranteeing certainty. Richard Weaver writes, "Rhetoric speaks to man in his whole being and out of his whole past and with reference to values which only a human being can intuit."[55] Replacing "rhetoric" with "scientific argument" and "man," "human being" with "scientist" yields a statement remarkably close to Polanyi's positi . Indeed, as a measure of the distance we have traveled, we should recall a citation from Perelman earlier in this paper (p. 8). As distinct from science, Perelman says that a controversy may be entered only by a member of the group to be affected by the outcome. In Polanyi's analysis, that distinction is erased.

Polanyi's purpose, we recall, is to defend the autonomy of thought in the sciences and, by extension, in all disciplines. We have seen him doing so by emphasizing the dynamics of discovery and the role in the accreditation of

knowledge of persuasive acts between members of a scientific community. As Polanyi puts it, "The verification of a statement is transposed into giving reasons for deciding to accept it" (PK, p. 320). In effect, Polanyi defends the independence of scientific activity by emphasizing its rhetorical character. As one student of Michael Polanyi, a physicist, has put it, "Science is the attempt to render nature persuasive to one's colleagues."[56] As another says, "Rhetoric . . . surely is the only word we may use once we have dethroned positivism."[57]

Perhaps, then, it is not surprising to find Polanyi voicing his ambitions and ideals in terms which will be familiar to our field. He is attempting to re-establish "rational grounds on which man can hold convictions and act on those convictions" (LL, p. 28), he wants to affirm grounds for "popular belief in the reality of justice and reason" (LL, p. 5), and he affirms faith in "the reality of truth and . . . the efficacy of reasoned argument" (SFS, p. 75).

Polanyi's project has taken him well beyond the analyses this paper can sketch. In particular, it has led him to advance a distinctive epistemology, of "tacit knowing," which is grounded in the reality of heuristic acts, insists that all our knowledge is grounded in and sustained by the informal matrix of inarticulate, tacit, presuppositions to which we are committed, seeks to pertain to knowledge of all kinds — from the relatively "objective" physical sciences, where operations of the tacit are minimal, except in acts of discovery, to the thoroughgoing commitments of art and ethics, where the tacit dimension is especially deep. Throughout, Polanyi sees thought embodied in persons seeking truth, not as the mechanical operations of some disembodied intellect. Indeed, the general thrust of Polanyi's epistemology can be seen most efficiently

in the title of his most extensive work, Personal Knowledge: Acts of knowing involve the whole person, and they somehow establish contact with what is really there. The epistemology of tacit knowing seeks to overcome the dichotomy between "subjectivity" and "objectivity," either side of which must maintain that opinions cannot usefully be argued, a dichotomy which therefore is disastrous for rhetorical theory.

I have devoted the first half of this paper to uncovering some general features which underlie rhetorical theory and to sketching what I believe is an understandable but unfortunate confusion we rhetoricians currently have concerning the nature of science and, by extension, the nature of our own field. I believe that problem deserves our attention in its own right, and I believe it warrants our study of Michael Polanyi and any other philosophers of science who are developing similar insights. I have sketched Polanyi's concerns and his conception of scientific communities; I have only suggested the shape of his epistemology.

There are several reasons I believe Polanyi in particular deserves further study by rhetorical theorists: both his being called to philosophy by the same broad concerns that animate contemporary rhetorical theory and his formulations that I have sketched argue his kinship with the tradition of rhetoric. He offers us significant rhetorical criticism of contemporary ideologies which are informed by objectivist conceptions. His association of heuristic acts with acts of persuasion may deepen our understanding of the traditional link between invention and any rhetoric that is more than merely verbal. He shows that acknowledgment of rhetorical processes need not undercut our knowledge claims, that it can instead undergird inquiry that is both autonomous and responsible; in effect, he undergirds autonomy by

emphasizing that communities of men achieve assent through rhetorical operations.[58] Finally, though I have not directly attended to the issue in this paper, it may be that his epistemology answers the call we have heard Richard Weaver make for a "more complete" epistemology than any currently available, one which undergirds rhetorical transactions generally and sanctions and helps us more adequately to understand the vast range of discourse which our current definitions of rhetoric are calling us to embrace.

FOOTNOTES

[1]Donald C. Bryant, "Retrospect and Prospect: 1970," QJS, 57 (1971), p. 6.

[2]Kenneth Burke, A Rhetoric of Motives (Berkeley, Calif.: University of California Press, 1969), p. 43.

[3]Philosophy, Rhetoric and Argumentation, ed. Maurice Natanson and Henry W. Johnstone (University Park, Pa.: The Pennsylvania State University Press, 1965), pp. 102-125.

[4]Perspectives in Education, Religion, and the Arts, ed. Howard E. Kiefer and Milton K. Munitz (Albany, N. Y.: State University of New York Press, 1970), p. 418.

[5]Language is Sermonic, ed. Richard L. Johannesen et al. (Baton Rouge, La.: Louisiana State University Press, 1970), p. 204.

[6]"Oral Rhetoric, Rhetoric, and Literature," Philosophy and Rhetoric, 1 (1968), pp. 196-97.

[7]Language is Sermonic, p. 161.

[8]"The Relevance of Rhetoric to Philosophy and of Philosophy to Rhetoric," QJS, 52 (1966), p. 45.

[9]"Rhetoric: Its Functions and Its Scope," quoted from Contemporary Rhetoric: A Reader's Coursebook, ed. Douglas Ehninger (Glenview, Ill.: Scott, Foresman, 1972), pp. 20-21.

[10]See Ehninger, "Introduction," Contemporary Rhetoric, pp. 1-14.

[11]Quoted from Ray D. Dearin, "The Philosophical Basis of Chaim Perelman's Theory of Rhetoric," Contemporary Theories of Rhetoric: Selected REadings, ed. Richard L. Johannesen (New York: Harper & Row, 1971), p. 227.

[12]See, for example, The Problem of the Self (University Park, Pa.: The Pennsylvania State University Press, 1970).

[13]Language is Sermonic, p. 160; cf pp. 183-84.

[14]Contemporary Rhetoric, p. 3.

[15]See A Rhetoric of Motives, p. 172.

[16]The Prospect of Rhetoric, ed. Lloyd F. Bitzer and Edwin Black (Englewood Cliffs, N. J.: Prentice-Hall, 1971), p. 119; cf. p. 121.

[17]Language is Sermonic, p. 221.

[18]Philosophy, Rhetoric and Argumentation, p. xi.

[19]The Prospect of Rhetoric, p. 110.

[20]Rhetoric and Criticism (Baton Rouge, La.: Louisiana State University Press, 1963), p. 16.

[21]See The Prospect of Rhetoric, p. 118, and Justice (New York: Random House, 1967); p. 58.

[22]See Perelman and L. Olbrechts-Tyteca, The New Rhetoric: A Treatise on Argumentation, trans. John Wilkinson and Purcell Weaver (Notre Dame, Ind.: University of Notre Dame Press, 1969), p. 34.

[23]The New Rhetoric, p. 32.

[24]Ibid., p. 33.

[25]Language is Sermonic, p. 204.

[26]Ibid., p. 154.

[27]Ibid., p. 147.

[28]Ibid., p. 150.

[29]"Polanyi's Interpretation of Scientific Inquiry," Intellect and Hope: Essays in the Thought of Michael Polanyi, ed. Thomas A. Langford and William H. Poteat (Durham, N. C.: Duke University Press, 1968), p. 241.

[30]"The Rhetorical Situation," quoted from Contemporary Rhetoric, p. 44.

[31]The New Rhetoric, p. 60; emphasis added.

[32]"Language as Intrapersonal and Poetic Process," Philosophy and Rhetoric, 2 (1969), p. 206.

[33]Visions of Order (Baton Rouge, La.: Louisiana State University Press, 1964), p. 56.

[34]Language is Sermonic, p. 141; cf. p. 145.

[35]Quoted from Jerry H. Gill, The Possibility of Religious Knowledge (Grand Rapids, Mich.: Wm. B. Eerdmans, 1971), p. 196.

[36]A. d'Abro, as quoted in George W. Morgan, The Human Predicament: Dissolution and Wholeness (New York: Dell, 1970), p. 10.

[37]Rhetoric, Romance, and Technology (Ithaca, N. Y.: Cornell University Press, 1971), pp. 213-36.

[38]From Classic to Romantic (New York: Harper, 1961), p. 31.

[39]Ibid., p. 31.

[40]A History of Western Philosophy (New York: Simon and Schuster, 1945), p. 568.

[41]See "The New Rhetoric," p. 302, as well as the following, also by Perelman: "Polanyi's Interpretation of Scientific Inquiry," Intellect and Hope, pp. 232-251; "The Role of Decision in the Theory of Knowledge," The Idea of Justice and the Problem of Argument, tr. John Petrie (London: Routledge & Kegan Paul, 1963), pp. 88-97. See also L. Olbrechts-Tyteca, "Rencontre avec la rhetorique," Logique et Analyse, 6 (1963), pp. 3-18 and Max Loreau, "Rhetoric as the Logic of the Behavioral Sciences," QJS, 51 (1965), pp. 455-63.

[42]"Truth, Communication, and Rhetoric in Philosophy," Revue Internationale de Philosophie, 23 (1969), p. 406.

[43]The Prospect of Rhetoric, p. 71.

[44]"Nihilism and the Problem of a Worthy Rhetoric," Southern Speech Journal, 34 (1968), p. 197.

[45]Language is Sermonic, p. 184.

[46]Visions of Order, pp. 134-35.

[47]Ideas Have Consequences (Chicago: University of Chicago Press, 1948), p. 164.

[48]Language is Sermonic, p. 133.

[49]Op. cit., p. 17.

[50]Op. cit., p. 223.

[51]Where I quote Polanyi's major works, the text itself will bear abbreviations as follows:

K & B — Knowing and Being, ed. Marjorie Grene (Chicago: University of Chicago Press, 1969).

LL — The Logic of Liberty: Reflections and Rejoinders (Chicago: University of Chicago Press, 1952).

PK — Personal Knowledge: Towards a Post-Critical Philosophy (New York: Harper, 1964).

SFS — Science, Faith and Society (Chicago: University of Chicago Press, 1964).

[52]See LL, pp. 61ff and "The Message of the Hungarian Revolution," K & B, pp. 24-39.

[53]"Genius in Science," Science, 38 (1972), p. 44.

[54]Of course I am referring to the "refutationalism" advanced, for instance, by Sir Karl Popper. For Polanyi's comments, see "Genius in Science," p. 46, and "The Creative Imagination," Tri-Quarterly, 8 (1967), p. 111.

[55]Language is Sermonic, pp. 183-84.

[56]William T. Scott, in a conversation at "A National Conference on Culture and Crisis: The Social Thought of Michael Polanyi," St. Leonard College, Centerville, Ohio, May 4-8, 1972. My impression is that Professor Scott has used this formulation in print, but I have not come across the reference.

[57]John Ziman, Public Knowledge: An Essay Concerning the Social Dimension of Science (Cambridge: Cambridge University Press, 1968), p. 32.

[58]In closing, I must at least cite an impressive work, indebted to Polanyi, which has appeared too recently to have informed this paper: Wayne C. Booth, Modern Dogma and the Rhetoric of Assent (Notre Dame, Ind.: University of Notre Dame Press, 1974.