INFORMATION TO USERS

This was produced from a copy of a document sent to us for microfilming. While the most advanced technological means to photograph and reproduce this document have been used, the quality is heavily dependent upon the quality of the material submitted.

The following explanation of techniques is provided to help you understand markings or notations which may appear on this reproduction.

1. The sign or "target" for pages apparently lacking from the document photographed is "Missing Page(s)". If it was possible to obtain the missing page(s) or section, they are spliced into the film along with adjacent pages. This may have necessitated cutting through an image and duplicating adjacent pages to assure you of complete continuity.

2. When an image on the film is obliterated with a round black mark it is an indication that the film inspector noticed either blurred copy because of movement during exposure, or duplicate copy. Unless we meant to delete copyrighted materials that should not have been filmed, you will find a good image of the page in the adjacent frame. If copyrighted materials were deleted you will find a target note listing the pages in the adjacent frame.

3. When a map, drawing or chart, etc., is part of the material being photographed the photographer has followed a definite method in "sectioning" the material. It is customary to begin filming at the upper left hand corner of a large sheet and to continue from left to right in equal sections with small overlaps. If necessary, sectioning is continued again—beginning below the first row and continuing on until complete.

4. For any illustrations that cannot be reproduced satisfactorily by xerography, photographic prints can be purchased at additional cost and tipped into your xerographic copy. Requests can be made to our Dissertations Customer Services Department.

5. Some pages in any document may have indistinct print. In all cases we have filmed the best available copy.
Davis, William Lamar, III

SCIENCE, POETRY, FREE PLAY

Rice University

University Microfilms International

300 N. Zeeb Road, Ann Arbor, MI 48106

Copyright 1982
by
Davis, William Lamar, III
All Rights Reserved
RICE UNIVERSITY

SCIENCE, POETRY, FREE PLAY

by

WILLIAM LAMAR DAVIS, III

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE

DOCTOR OF PHILOSOPHY

APPROVED, THESIS COMMITTEE:

Wesley A. Morris, Professor of English, Chairman

Walter W. Isle
Professor of English

Robert Lane Kaufmann, Assistant Professor of Spanish

HOUSTON, TEXAS
APRIL, 1982
ABSTRACT

Science, Poetry, Free Play

by

William Lamar Davis, III

The felt antithesis between science and poetry has a long history. Almost every major theorist of literature, from Sidney through Arnold to Cleanth Brooks, has defined literature in contradistinction to science. This rejection of "scientism" and the simultaneous veneration of the symbolic imagination available in literature reached its zenith in the New Criticism, but it has diminished only slightly in those more contemporary "post-structuralist" theories which view themselves in opposition to New Critical arguments. In fact, the rejection of the scientific model has become the cornerstone in most definitions of literature.

There are a good many ironies in this situation. The opposition of referential and non-referential language has resulted in a certain impotence in those theorists who wish to argue against the heightened anti-humanism of post-structuralist theory. Another irony is that while rejecting the calculative enterprise of science, the formalist impulse allowed the hated objectivism of classical science to sneak in the back door. The final and most important irony is that at the very time when the New Critical theorists were reinvigorating the romanticist rejection of science, science itself was undergoing a radical change in theoretic orientation. Modern science, in fact, has encouraged a movement away from objectification, pure referential meaning, and empirically verifiable truth.
The purpose of this dissertation is to investigate these ironies by exploring some of the ramifications which physics and mathematics, the most "exact" of the sciences, may have for literary theory. The primary goal is to correct the misunderstanding which literary theorists have had about the implications of modern science; a secondary goal is to suggest that some of those implications may prove useful to an understanding of symbolic systems and the poet-text-reader relationship. The dissertation provides a survey of critical theories, with greater emphasis given to more recent arguments. These are compared with the implications of relativity theory, quantum mechanics, the mathematical insights of Kurt Gödel, and the theses of the so-called "new philosophers" of science.
ACKNOWLEDGEMENTS

The original idea for the thesis of this dissertation began in conversations with my friend and colleague Jack Holliday. Without his encouragement I should probably never have begun the project. I have many people to thank at Rice University for the advice and intellectual stimulation they provided. I am particularly grateful to Professors Alan Grob and Walter Isle for their wisdom and good humor. I am also indebted to Professor Lane Kauffmann for his thorough reading of the text. I owe so much to my friend and teacher, Wesley Morris, that I cannot begin to thank him in these few words. He combines a rare intellectual rigor and personal humility which make him a model for my teaching and scholarly career. I would also like to thank Vera Wallis for her patience in typing the text. Finally, I would like to express my gratitude to my parents, without whose support and steadfastness this project would not have been completed.
TABLE OF CONTENTS

CHAPTER ONE:  INTRODUCTION ........................................ p. 1

CHAPTER TWO:  SCIENCE AND THE NEW CRITICS ........................ p. 12


The New Enemies of Science ........................................ p. 33

The New Critics: Enemies of Science? ............................. p. 51

Conclusion ............................................................ p. 67

CHAPTER THREE:  THE CONSCIOUSNESS OF A NEW SCIENCE .......... p. 81

A New Science: The Ontological Dimension .................... p. 81

A New Science: The Imaginative Dimension .................... p. 117

A New Science: The Historical Dimension ...................... p. 143

Conclusion ............................................................ p. 170

CHAPTER FOUR:  SCIENCE, POETRY, FREE PLAY ..................... p. 189

The Question of Authority .......................................... p. 189

Science, Poetry, Free Play ......................................... p. 234

CHAPTER FIVE:  AFTERWARD ........................................... p. 273
CHAPTER ONE: INTRODUCTION

If the time should ever come when what is now called Science, thus familiarized to men, shall be ready to put on, as it were, a form of flesh and blood, the Poet will lend his divine spirit to aid the transfiguration, and will welcome the Being thus produced, as a dear and genuine inmate of the household of man. — Wordsworth, 1802 Preface

When C. P. Snow delivered his Rede Lecture at Cambridge in 1959, he addressed his conviction that the "intellectual life of the whole of western society is increasingly being split into two polar groups."¹ Coining the phrase, "the two cultures," he suggested that "literary intellectuals" were "at one pole" while at the other pole were the "scientists, and as the most representative, the physical scientists."² The address created quite a stir; rebuttals and counter-rebuttals were hammered out in Encounter and The Spectator, and when F. R. Leavis had occasion to deliver his Richmond Lecture in 1962, he chose to focus on the errors of Snow's perspective. Leavis cautioned that Snow was "utterly without a glimmer of what creative literature is, or why it matters."³ Apparently, it wasn't so much the theory of societal bifurcation that Leavis rejected; rather, it was the sense that Snow had somehow misplaced his priorities—that Snow had placed a disproportionate blame for this calamity on the "literary intellectual." The real objection, it would seem, was to the plural marker placed on "culture." After all, according to Leavis, "equations between orders [science and literature] so disparate are meaningless."⁴
This debate, of course, is not new to the "great tradition." It originates with Plato's rejection of the poet, whose works are thrice removed from Reality. It reappears with Sidney's Apologie for Poetrie and with Shelley's Defense of Poetry, both of which were responses to threats similar to that which Leavis found in Snow. It finds its most eloquent expression with the Kantian arguments of the German romantic philosophers and with Coleridge's veneration of the synthesizing, esemplastic power of the poetic imagination, all of which were delayed responses to the empiricism and positivism of Locke, Bacon, Hobbes, and Hartley. Indeed, the distinction between science and poetry is part of the very grounding for the romanticist definition of the aesthetic faculty, a faculty which, thanks to the "Copernican Revolution" of Kant, could finally be liberated from the constraints of the analytic Understanding. The aesthetic faculty, finding its highest function in the poetic impulse, could now be posited as different in kind, offering its own unique, and more promising, vision of the infinite Reality. This duality is complete in almost all of romanticist thought: subject/object, symbol/allegory, synthesis/analysis, intrinsic/extrinsic, infinite/finite, imagination/fancy, intuition/proposition, poetry/science.

The debate between Snow and Leavis thus has a long tradition behind it. It is also highly reminiscent of—particularly with its concern with the methodology of educational institutions—the skirmishes between Huxley and Arnold, the latter being, protestations to the contrary, an important forerunner of the formalism of twentieth-century Anglo-American criticism. The nature of this schism, however, changes
somewhat in its more modern form. While Arnold still maintains the split between science and poetry, the latter now becoming the substitute for religion, he is willing, as Murray Krieger puts it, to "concede to laboratory-controlled science the sole access to truth."\(^8\) The theme is taken up by I. A. Richards who allows "statements" to science while reserving for poetry what he labeled "pseudo-statements," which, as some sort of neo-positivistic overlay of Coleridge's "reconciliation of opposites," encourages the health of the psyche.\(^9\) Although the affective psychologism of Richards was easily (and necessarily) jettisoned by most Anglo-American theorists, the duality between science and poetry was to continue to resurface. Ransom's poetry "holds out stubbornly against science";\(^10\) Tate's poetry is much more complete than "the world of verifiable science";\(^11\) Brooks' poetry is not created by a poet who analyzes "his experience as the scientist does."\(^12\) In one form or another the theories of the New Critical tradition found refuge against the threat of "scientism" by defining the true poem as a self-contained, autotelic entity which should not be referred "to something outside" itself.\(^13\) Indeed, to do so, as Brooks argues, is to "bring the statement to be conveyed into an unreal [unfair?] competition with science . . . ."\(^14\)

But, of course, the New Critics really did want the poem to refer to something outside itself. In order for the poetic "experience" to be valuable, it couldn't be collapsed into a hedonistic "art for art's sake" view. Poetry had to present the experience of the world. This need, however, presented some problems, as Krieger noted in his
summation of the New Apologists for Poetry.

How can poetry tell us something about our world that we can learn nowhere else when for the contextualist it is not in any obvious sense referential? We have seen how great the cost of making poetry referential would be. If it were referential in the sense which prose discourse is, then obviously what it would tell us about the world we could learn anywhere else. But if it were not referential, how could it tell us anything? It is this dilemma that Krieger has been grappling with ever since.

Moreover, it is this dilemma which has made the post-structuralism of Derrida and his Yale followers so difficult for the Anglo-American tradition. The anti-scientific and anti-referential impulse has permeated this tradition (with few exceptions) and the challenge of post-structuralism is double edged: on the one hand, it denies to poetry a unique language; it replaces the paradox, ambiguity, and irony—once thought to accentuate the uniqueness of poetry's fictive language—with the aporia of all language; on the other hand, it denies the possibility of any sort of referential meaning, except for the centrifugal intertextualism of all texts; it denies presence either in or out of the poem. Thus, the dilemma is cancelled by collapsing both horns into the infinite free play of the signifying system.

There are a good many ironies in this situation. The opposition of referential and non-referential language has resulted in a certain impotence in those theorists who would argue against the heightened anti-humanism of post-structuralist theory. Another irony is that while rejecting the calculative enterprise of science, the formalist
and new critical impulse allowed the hated objectivism of classical science to sneak in the back door. Indeed, it was there from the initial positing of an impersonal theory of poetry which allowed the poem to be seen as an object.\textsuperscript{17} In Europe it found its seed in the neo-positivism of Russian Formalism and its fruition in what we have come to call structuralism.\textsuperscript{18} In the United States it found its impetus, somewhat less obviously, in the entrenchment of literature as a unique discipline (nurtured by the educational establishment) and culminated in the competence theories of Northrop Frye and Jonathan Culler. The final and most important irony, however, is that at the very time when the new critical theorists were reinvigorating the romanticist rejection of science, science itself was undergoing a radical change in theoretic orientation. The static universe of Laplace and Descartes was replaced with a dynamic and emerging universe; the goal for objective truth was replaced with the realization that observable and observer formed an intricate relationship; the veneration of determinancy was replaced by the acceptance of indeterminancy; the certainty of axiomatic reasoning was replaced with the freedom allowed by self reference.

The purpose of this dissertation is to investigate these ironies by exploring some of the ramifications which physics and mathematics, the most "exact" of the sciences, may have for literary theory. The primary goal is to correct the misunderstanding which literary theorists have had about the philosophical implications of modern science; a secondary goal is to suggest that some of those impli-
cations may prove useful to an understanding of symbolic systems and
the poet-text-reader relationship.

The bulk of the dissertation is divided into three parts. Chapter
Two focuses on the New Criticism. The first section, "Science vs.
Poetry: The Inheritance of the New Critics," presents an overview
of the historical opposition to science which has existed in literary
theory and which undoubtedly helped shaped the New Criticism. The
science/poetry split is not new to formalism, and the section attempts
to clarify the roots of the New Critical antipathy toward science.
The second section, "The New Enemies of Science," is a study of the
New Criticism and its understanding of scientific endeavor. Although
the opposition between science and poetry is not unique to formalist
doctrine, the attacks on science reached a more significant level of
intensity in the literary theories of the New Critics. For Ransom,
Tate, Brooks, and other New Critical theorists the very nature of
poetic and imaginative literature could be defined only in contra-
distinction to science. In fact, at the height of the New Critical
influence it is apparent that the role of science is an inescapable
element in the constructs of critical theory. The third section of
Chapter Two, "The New Critics: Enemies of Science?," suggests,
despite this antipathy to science, that certain positivistic tendencies
exist within the New Critical tradition as well as within the formalist
offshoot of structuralism. It is ironic, given the vehemence of the
New Critical antipathy toward science, that Anglo-American formalism
could itself be susceptible to the charge of scientism, but this
charge has been leveled from a variety of critical perspectives, including the reader-response criticism of David Bleich, the Heideggerian perspective of William Spanos, and the dialogic phenomenology of Richard Palmer. The section suggests that there is much validity to their charges.

Chapter Three, "The Consciousness of a New Science," is a study of some of the major discoveries in twentieth-century science and their accompanying philosophical implications. Section one, "A New Science: The Ontological Dimension," is an explanatory review of relativity theory, complementarity, and quantum mechanics. The major thrust of the section is to show that twentieth-century science has seriously questioned the subject-object dichotomy upon which the popular conception of scientific methodology is based. No longer believing that verifiable description of objective states of affairs is possible, modern science posits an interactive relationship between subject and object, suggesting a nexusical reality akin to much in a phenomenologically based ontology. Section two, "A New Science: The Imaginative Dimension," moves from a consideration of the discoveries in twentieth-century physical science to those of mathematical science. Central to this consideration are the theorems of Kurt Gödel which, it is suggested, are parallel to the linguistically based arguments of Jacques Derrida. Gödel's proof of the logical insufficiency of symbolic systems plays a significant role in the philosophies of science of Karl Popper and Jacob Bronowski. Popper represents a transition from an older nineteenth-century scientific view of truth
as correspondence to the twentieth-century view of truth as imaginative coherence. Bronowski, more than any other thinker studied, promotes a philosophy of science which attests to the parallel concerns of science and poetry. The third section, "A New Science: The Historical Dimension," presents the arguments of the so-called "new philosophers of science." The views of T. S. Kuhn, Stephen Toulmin, N. R. Hanson, and Michael Polanyi all attest to the recognition of the roles which language, culture, and tradition play in scientific discovery.

In fact, it is hoped that the reader will see how important culture, tradition, meaning and language have become for modern science. Although Chapter Three has been divided into three sections, each of which emphasizes one "dimension" of science, these dimensions are anything but mutually exclusive. Each section, for example, deals with the problematics of language, tradition, and interpretation, and the discoveries and theories covered in the first section provide background for the more philosophical arguments of the last two sections. It is hoped that the reader with an interest in contemporary literary theory will note similarities between these issues of scientific discovery and the major concerns of contemporary literary inquiry.

Chapter Four attempts to delineate more precisely these concerns. The first section, "The Question of Authority," is a survey of some of the more important literary theories which are debated today. As the title to the section attempts to suggest, the major issues in contemporary critical debate are the questions of determinancy and whether meaning is a product of an author, inheres in the text, or
arises in the reader. This section should also make clear that science continues to play a crucial role in the more influential theories of literature now current. The second section, "Science, Poetry, Free Play," suggests that some of the insights afforded by twentieth-century science may offer a solution to the impasse which the "question of authority" poses. Crucial to this section are the arguments of Jacques Derrida, Martin Heidegger, and Hans Georg-Gadamer, which parallel the views of interpretation promulgated in twentieth-century philosophies of science.

The dissertation concludes with a short afterward in Chapter Five.

Undoubtedly, this dissertation raises more problems than it offers solutions. The issues in contemporary hermeneutics go far beyond the pedagogical pragmatics which a theory of reading might espouse, and the student of literary theory is today faced with challenges from a variety of disciplines that were not as apparently relevant as little as two decades ago. To suggest that the discoveries and philosophies of modern science are also relevant to a study which has traditionally defined itself in isolation from science may seem to add even more confusion. Perhaps for some it may even smack of a distasteful idolatry. Nevertheless, the relationship between science and poetry seems a far richer field for study than has been allowed in the past. If what follows presents more problems than even tentative solutions, it is because problems are always easier to discover than solutions, not because the concerns of science and literature are unrelated. At least, that is the thesis of this dissertation. Rather than two
separate, cultural antagonists, science and poetry are better viewed as colleagues engaged in similar interpretive pursuits.
END NOTES


5 I am thinking of Eliot.

6 It is significant, for example, that the epigraph at the beginning of Richards' *Science and Poetry* is taken from Arnold.


16 E. D. Hirsch seems an anomaly in this respect.

17 I am thinking of Eliseo Vivas, in particular, who tries to develop a theory of hierarchies which would allow the poem both to be an object and to refer to an object outside itself. See Eliseo ed. Hazard Adams (New York, 1971), pp. 1069-1077.

18 For a discussion of this orientation see Ewa M. Thompson, *Russian Formalism and Anglo-American New Criticism* (Paris, 1971).
CHAPTER TWO: SCIENCE AND THE NEW CRITICS

I believe, indeed, that if poetry survives to-day, although so evidently an art with which one cannot 'cash in,' it is thanks to the theory that poetry is not only quite different from science, but is in its essence opposed to science and so must be let go its own way.

--Allen Tate

... the poet has, not a "personality" to express, but a particular medium, which is only a medium and not a personality ... .

--T.S. Eliot

Science vs. Poetry: The Inheritance of the New Critics

It is difficult to discuss the formative influences on the New Critics. The aesthetic tradition they respond to and within is broad and complicated. Moreover, one runs a risk of reductionism in speaking of the New Critics as if they comprised a unifaceted movement with a single purpose and unique methodology. René Wellek, for example, is undoubtedly correct when he argues, as recently as 1978, that the "group was far from unified."¹ Wellek, perhaps the most knowledgeable defender of New Critical aesthetics, cautions against the temptation to collapse into a single perspective such divergent views as those represented by Ransom, Tate, Brooks, Warren, Blackmur, and Winters.

-12-
The view that the New Criticism represents a coterie or even a school is mistaken. With the evidence of disagreements among these critics ... it may seem wise to conclude that the concept and term should be abandoned and these critics discussed each on his own merits.²

Wellek's caution is a reasonable one, and it is echoed a year later when Wendy Steiner offers a warning "for any who try to respond to the New Critics as a monolithic movement."³

Such cautions are wise ones to heed. And yet, one is still tempted to run this risk of reductionism simply because the term, "New Criticism," has come to stand for a certain way of approaching the text, one which permeated academic institutions and one which still serves as the background for our teaching methodologies as well as our more openly theoretic concerns. At the heart of this stance is the "basic assumption," as William J. Handy puts it, of the "uniqueness and particularity of [the] qualitative experience" of literature.⁴

The New Critic

wishes to show how he arrived at the necessity of his assumption, a process which can be accomplished only negatively, by revealing the inadequacy of the logical concept to represent all aspects of human experience. He begins, in short, with an examination of the differences between scientific and poetic discourse.⁵

It is, in fact, this dichotomy between science and poetry which is normally seen as the very grounding for New Critical theories. One cannot help but note in this connection how both Wellek and Steiner are lured to risk the very reductionism they caution against. Wellek: "Actually the New Critics are enemies of science."⁶ Steiner: "For
the New Critics' point of departure—and one of the few tenets that they held in common—was the belief that art creates a mode of knowledge different in kind from that of practical or scientific discourse and that a criticism modeled on the latter would miss the essence of its subject matter."  

However, the distinction between science and poetry is not unique to the New Critics; in fact, this antithesis runs throughout the entire history of aesthetics. This is another reason why the risk of reductionism is somewhat less jeopardizing; it is an old story now. The basic dichotomy undergoes transformations from time to time, but the dichotomy, as marked difference, remains firm all the same. It is possible, for example, to see Aristotle's *Poetics* as the first defense of poetry, a defense which shores it against the Platonic attack that poetry is a misguided avenue to Truth.  

If this seems an unwarranted overlay of a more modern dichotomy, this may be only because the notion of science as a peculiar discipline is not germane to Plato's metaphysics or because, standing on the other side of the nineteenth century, we are more inclined to see Aristotle's thought about "probable impossibilities" as a parallel to something like Samuel Johnson's quest for universals. Clearly, the characteristics attributed by Aristotle to history and philosophy will come to be epitomized by science once it is established as a separate discipline. And clearly, the tenets of Plato's attack are the same as those most feared by more modern "apologists": poetry excites emotions, offers only an imitative copy, and eschews the rational faculty. If Aristotle's "defense" of
poetic truth as something midway between the particular and the universal, involving the purgation of emotion, does not seem to settle the question, this is because there are other, often more enticing, ways to meet the challenge. What is interesting is that the challenge—or at least what is thought to be the challenge—remains roughly the same from the very beginning. At issue is always truth and how truth can be known.

If, for example, one turns to Sidney (who, tellingly enough, is normally the next figure after Aristotle to appear in the table of contents of anthologies of poetics) one discovers essentially the same concerns being voiced some nineteen hundred years after Aristotle. However, besides tackling the problems of history and philosophy in the Aristotelian vein (with, of course, echoes of Horace), Sidney also seems willing to meet the champions of truth on their own grounds. Unfortunately he is able only to dispell the belief that poets are liars. "To the second [attack against the poet] therefore, that they should be the principal liars, I answer paradoxically, but truly, I think truly, that of all writers under the sun the poet is the least liar." He is able to refute the attack that poets lie only by admitting that they do not show the truth.

Now, for the poet, he nothing affirms, and therefore never lieth. For, as I take it, to lie is to affirm that to be true which is false; so as the other artists, and especially the historian, affirming many things, can, in the cloudy knowledge of mankind, hardly escape from many lies. But the poet (as I said before) never affirmeth. The poet never maketh any circles about your imagination, to conjure you to believe for true what he writes.
Accompanying this self-conscious non-truth is the possibility of making a new world which is not tied to the "brazen" world of actuality.

Only the poet, disdaining to be tied to any such subjection, lifted up with the vigor of his own invention, doth grow in effect another nature, in making things either better than nature bringeth forth, or, quite anew, forms such as never were in nature.

This notion that the poet is not a servile copier but, as Sidney says, a "maker" clearly would entice the romantic idealist of the nineteenth century.

In order to avoid confusion (and perhaps the anxiety of boredom) it should be made clear that the purpose of mentioning Aristotle and Sidney is not in any way to present a history of poetics. Moreover, it is not to suggest that Sidney was a decisive influence on romantic theorists or more modern thinkers. The purpose is threefold: to suggest (1) that the dichotomy between science and poetry, while it follows one form in romantic theory and a different one in the New Criticism, reflects an antithesis which is older than either; (2) that the problematics of truth is central to that antithesis, regardless of its transformation; (3) that Sidney is a convenient way to illustrate the omnipresence of this dichotomy since he can be linked to Aristotle and suggests elements of both romantic and more modern theories. The goal of this section, as suggested by its title, is, after all, to understand the antithesis between science and poetry as it affected the New Critics. It would be a mistake to suggest that this perceived antithesis was something which the New Critics developed on their own accord.
In fact, the New Critical antipathy to science is, as M. H. Abrams puts it, "a legacy from the prepossessions and preoccupations of some of the new critics of the earlier century."¹² William Handy, in this connection, is correct when he asserts that the "particular form of anti-intellectualism, the inadequacy of the logical concept, so important to the poetic theory of Wordsworth, Coleridge, and the romantic poets generally, is basically the same form present in the repudiation of science characteristic of present-day criticism."¹³ However, there are some apparent differences which Handy, in his enthusiasm for the New Critics, ignores. The differences suggest the way in which the New Critics were able to reject the more expression-oriented theories of the nineteenth century and yet were still able to advance a radical science/poetry dichotomy.

By the beginning of the nineteenth century the pressures felt to be asserted against poetry had become formidable. In fact, according to Hazard Adams, "positivistic science . . . in the nineteenth century had threatened to take over the whole ground of human knowledge."¹⁴ The forces, of course, had been growing for some time. Bishop Sprat, as early as 1672, for example, had suggested that great progress had been made when the search for knowledge was able to jettison the "assistance of Poetry."¹⁵ Hobbes's view of the imagination as "decaying sense"¹⁶ was hardly helpful in lending prestige to poetry as a cognitive enterprise. Similarly, Locke's distinction between the primary and secondary qualities of experience—the former, as measurable, being the objective and real—gave rise to a psychology held for
several hundred years and tended to deny cognitive truth to the poetic faculty. In Locke's view, "all the artificial and figurative application of words eloquence hath invented, are for nothing else but to insinuate wrong ideas, move the passions, and thereby mislead the judgment; and so indeed are perfect cheats."

(Clearly this charge from a fledgling science is the same as Plato's.) The rise of science lead both Vico and Herder, more regretfully, to see man as inevitably moving away from the vitality of poetry and toward a world of scientific reason and technological domination. As Hazlitt put it in 1818, the progress of science had had a tendency "to clip the wings of poetry." And indeed, by 1820, with the battle lines more firmly entrenched, Peacock could argue with assurance "that poets must address their minstrelsy" to those "not awakened to the desire of valuable knowledge" and certainly not to "the thinking and studious, and scientific and philosophical part of the community."

But in whatever degree poetry is cultivated, it must necessarily be to the neglect of some branch of useful study: and it is a lamentable spectacle to see minds, capable of better things, running to seed in the specious indolence of these empty aimless mockeries of intellectual exertion. Poetry was the mental rattle that awakened the attention of intellect in the infancy of civil society: but for the maturity of mind to make a serious business of the playthings of its childhood, is as absurd as for a full-grown man to rub his gums with coral, and cry to be charmed to sleep by the jingle of silver bells.

Peacock's attack is indeed harsh.

The defenders of poetry, for their part, were clearly not content to stand idly by and allow such assaults as Peacock's to go unanswered.
Shelley's *Defense* is ample testimony. They were, however, willing to accept the science/poetry distinction, and in so doing to allow objective truth to science. Wordsworth, for example, suggests that "much confusion has been introduced into criticism by [the] contradistinction of Poetry and Prose, instead of the more philosophical one of Poetry and Matter of Fact, or Science." The truth of science, we are told, is "promulgated for its own sake," while poetry is associated with passionate expression. Coleridge defines the poem as "that species of composition, which is opposed to works of science, by proposing for its *immediate* object pleasure, not truth." Keats distinguishes the "charms" of poetry from that "touch of cold philosophy" which, unfortunately, can "conquer all mysteries by rule and line." Many of these concerns are pulled together in John Stuart Mill's definition of poetry.

The object of poetry is confessedly to act upon the emotions; and therein is poetry sufficiently distinguished from what Wordsworth affirms to be its logical opposite, namely, not prose, but matter of fact or science. The one addresses itself to the belief, the other to the feelings. The one does its work by convincing or persuading, the other by moving. The one acts by presenting a proposition to the understanding, the other by offering interesting objects of contemplation to the sensibilities.

In general, this willingness to accept the distinction between science and poetry was at first based on the assumption that the truth which science could discover was but a subset of the larger truth afforded by poetry. This somewhat comforting view was slowly and haltingly transformed into a view which saw science and poetry not as different avenues to truth but as affording radically different types of truth,
one objective and the other subjective. Finally, this bifurcation of truth was transformed into a legacy for the New Critics which gave truth to science and left to poetry either a sort of inspired passion or, as in Arnold and Richards, an impetus for psychological and social well-being.

Once the science/poetry dichotomy had been accepted, the problem was how to maintain poetic value in the face of scientific truth. Wimsatt and Brooks state the problem succinctly.

If scientific philosophy maintained that poetic statement did not satisfy scientific criteria, the answer was to be that poetry proceeded according to other criteria. In some way poetry proceeded according to its own criteria.

It was, of course, German romanticism which provided the way. In fact, as Wimsatt and Brooks perceive it, "German romanticism was a retort to scientism," and, as such, it provided a philosophical basis for overcoming the growing pejorative attitude toward poetry's status and value.

It is typical in this connection to attribute to Kant and his "Copernican Revolution" the immediate cause for the philosophical grounding of this new aesthetic, and it is true that in one way or another the Kantian philosophy permeated the period and helped accomplish this task. The mere fact that Kant provided an analysis of the aesthetic realm in a separate Critique from that of the Critique of Pure Reason was to suggest the autonomy of art. And, in fact, in the Critique of Judgment Kant begins by positing that the aesthetic judgment involves a separate faculty from the understanding. "In order to distinguish whether anything is beautiful or not," he writes, "we
refer the representation, not by the understanding to the object for
cognition, but by the imagination (perhaps in conjunction with the
understanding) to the subject and its feeling of pleasure or pain."³¹
By freeing art from the concepts of the useful or the good, by suggest-
ing that it promulgates a "disinterested interest," Kant presents an
argument which, in René Wellek's exposition, "was stated for the first
time systematically in a defense of the aesthetic realm against all
sides . . . ."³² Art, for Kant, presents an "aesthetical idea" which
is a "representation of the imagination which occasions much thought,
without however any definite thought, i.e., any concept, being capable
of being adequate to it . . . ."³³ The imagination "occasions in it-
self more thought than can ever be comprehended in a definite concept
. . . ."³⁴ Moreover, it is "of all the arts poetry (which owes its
origin almost entirely to genius and will least be guided by precepts
or example) [that] maintains the first rank."³⁵

It strengthens the mind by making it feel its faculty—free, spontaneous, and independent of
natural determination—of considering and judging nature as a phenomenon in accordance with
aspects which it does not present in experience either for sense or understanding, and therefore
of using it on behalf of, and as a sort of schema for, the supersensible.³⁶

Clearly, here was a philosophical position which was to return art, at
the very least, to an equal footing with science. And indeed, Kant was
to provide the philosophic grounding not only for the romantic apolo-
gists of poetry but for the arguments of the "art for art's sake" move-
ment and the poetics of the New Criticism as well.

However, it would be a mistake to assume that Kant's philosophy
was subsumed untrammeled into the poetics of the nineteenth century. In the first place, it would be a mistake to assume that nineteenth-century poets were as intent upon working out a deductive system as rigorous as Kant's. More specifically, it would be a mistake to assume that the real starting point for a defense of the imagination was the *Critique of Judgment* rather than the *Critique of Pure Reason*. Rather, what happened was that a loosely understood version of Kant's view of the mind as constitutive of phenomena, put forth in the *Critique of Pure Reason*, and his association of "spirit" and "genius" with the "creative imagination," put forth in the *Critique of Judgment*, provided, along with massive infusions of Fichte and Schelling, a means of reconciling man and nature through the poetic impulse. It is helpful to quote Hans-Georg Gadamer in this connection.

Fichte and Schelling, who followed Kant's doctrine of *transcendental imagination* . . . , made new use of this idea in their aesthetics. Unlike Kant they considered the standpoint of art, as that of the unconscious production of genius, all-embracing, embracing even nature, which is understood as a product of the spirit. 38

In short, the transcendental idealism of Kant was transformed into an absolute idealism of the knowing subject. To quote Gadamer again,

Kant's main concern, however, which was to give aesthetics an autonomous basis freed from the criterion of the concept, and not to raise the question of truth in the sphere of art, but to base aesthetic judgment on the subjective a priori of our feeling of life, the harmony of our capacity for "knowledge in general". . . was in accord with the irrationalism and the cult of genius in the nineteenth century. Kant's theory of the "heightening of the feeling of life" in aesthetic pleasure helped the idea of "genius" to develop into a comprehensive concept of life,
especially after Fichte had elevated the position of genius, and of what genius created, to a universal transcendental position. Hence, by trying to derive all objective validity from transcendental subjectivity, neo-Kantianism declared the concept of experience to be the very stuff of consciousness.39

It is this emphasis on subjective consciousness, posited by Kant as a free faculty and apotheosized by Schiller as freedom itself, which could lead Hegel to define poetry as "the universal art of the mind, which has become essentially free, and which is not fettered in its realization to an externally sensuous material, but which is creatively active in the space and time belonging to the inner world of ideas and emotion."40

This emphasis on the subjective apprehension of beauty as removed from everyday reality at once gives the slip to science. Gadamer is once again helpful

The shift of the ontological definition of the aesthetic to the sphere of aesthetic appearance has its theoretical basis in the fact that the domination of the scientific epistemological model leads to the discrediting of all the possibilities of knowing that lie outside this new method.41

It is in this light that the veneration of symbol over allegory, from Goethe to Carlyle, can allow for the welding of particular and universal to arrive at a higher truth, defying referential or conceptual truth, always through the subjective consciousness of the poet. While allegory "does not resist rational comprehension through the concept," the symbol, always less definite and determinate, became the modus operandi of poetry the "moment art freed itself from all dogmatic bonds
and could be defined by the unconscious production of genius ... ."\textsuperscript{42}

Regardless of the form it took then, the intrusion of science into the realm of objective truth was to free the realm of a subjective and higher truth and give it to poetry. Hazard Adams, in simpler terms, echoes the passage of Gadamer quoted above: "The development of scientific method carried implications that led ultimately to the emergence of the expressive theory of art and its emphasis upon the artist's mental activity."\textsuperscript{43} Perhaps, for us, this emphasis upon the perception of the poet reaches its paradigmatic form in Wordsworth. In order to deal with the differentiating characteristics of poetry, Wordsworth is continually lured to a discussion of the poet.

Taking up the subject, then, upon general grounds, I ask what is meant by the word Poet? What is a Poet? To whom does he address himself? And what language is expected from him?\textsuperscript{44}

The answer is that the poet is a man "pleased with his own passions and volitions."\textsuperscript{45} He is a man with

an ability of conjuring up in himself passions, which are indeed far from being the same as those produced by real events, yet ... do more nearly resemble the passions produced by real events, than any thing which, from the motions of their own minds merely, other men are accustomed to feel in themselves; which, and from practice, he has acquired a greater readiness and power in expressing what he thinks and feels, and especially those thoughts and feelings which, by his own choice, or from the structure of his own mind, arise in him without immediate external excitement.\textsuperscript{46}

Unlike the "Man of Science [who] seeks truth as a remote and unknown benefactor," the poet "rejoices in the presence of truth as our visible
friend and hourly companion." It is the poet who can bridge the gap between the mind and nature, for it is the poet who sees "the mind of man as naturally the mirror of the fairest and most interesting qualities of nature." This emphasis on the subjective experience of the poet leads Wordsworth to his now famous definition of poetry.

I have said that Poetry is the spontaneous overflow of powerful feelings; it takes its origin from emotion recollected in tranquillity: the emotion is contemplated till by a species of reaction the tranquillity gradually disappears, and an emotion, kindred to that which was before the subject of contemplation, is gradually produced, and does itself actually exist in the mind.

In the note to "The Thorn" Wordsworth warns that "the Reader cannot be too often reminded that Poetry is passion." Thus, unlike science, which stands upon "external testimony," "poetry is the breath and spirit of all knowledge; it is the impassioned expression which is the countenance of all Science."

Coleridge, too, has his moments when he comes close to sounding like Wordsworth, but Coleridge can be seen, depending on one's perspective, as either a far subtler or far less coherent thinker than Wordsworth. René Wellek, in _Kant in England_, admits that "it will sound paradoxical to those who see in him a master of subtle analysis and fine distinction—but the truth is nevertheless this:"

Coleridge has little insight into the incompatibility of different trends of thought. He lacks a sense for the subtle shades of terminological differences in different thinkers, he is sometimes almost blind to the wide implications in this or that idea. It is not the fact that several central passages in Coleridge are borrowed or paraphrased or influenced by other thinkers; it is rather the
circumstance that these adaptations of other
thought are heterogeneous, incoherent and even
contradictory which makes the study of
Coleridge's philosophy ultimately so futile. 52

In any case, Coleridge is a rich thinker, and it cannot be hope in
these few pages to show how the elements of his thought might weave
together to form a whole; such a goal would be extravagant, particu-
larly since he stands as such a pivotal figure in Anglo-American
criticism, allowing several different, sometimes contradictory, poetic
theories to find their sources in his thinking.

One can, however, speak of three different threads in Coleridge's
"program," each of which serves as the immediate point of departure for
a poetics which sets up an antipathy to science. The first of these is
the Coleridge of the primary imagination. "The primary imagination I
hold to be the living power and prime agent of all human perception,
and as a repetition in the finite mind of the eternal act of creation
in the infinite I am."53 This is the thread in Coleridge's thinking
which supports the expressive theory. Here the attention is to the
perceptive-creative powers of the poet.

The poet, described in ideal perfection, brings
the whole soul of man into activity, with the
subordination of its faculties to each other,
according to their relative worth and dignity,
He diffuses a tone and spirit of unity, that
blends, and (as it were) fuses, each into each,
by that synthetic and magical power, to which
we have exclusively appropriated the name of
imagination. 54

This is the Coleridge who is concerned with "poetry" as opposed to the
"poem." Even more than Wordsworth, Coleridge here celebrates
the Schellingian view of the poet's ability to unite subject and object through the mind's attention to itself.

The second thread in Coleridge's thinking is that of the secondary imagination.

The secondary imagination I consider as an echo of the former, coexisting with the conscious will, yet still as identical with the primary in the kind of its agency, and differing only in degree, and in the mode of its operation. It dissolves, diffuses, dissipates, in order to recreate . . . .

Here the attention is given to the poem. "... if the definition sought for be that of a legitimate poem, I answer it must be one, the parts of which mutually support and explain each other; all in their proportion harmonizing with, and supporting the purpose and known influences of metrical arrangement." This is the Coleridge who is used to support the contextualist-oriented poetics of the New Critics, which, in seeing the poem as a closed, organic, linguistic unity rather than a mode of referential discourse, also continues the science/poetry polarity.

The third thread in Coleridge's thinking could be called the psychological thread. This is the Coleridge which can be used to support an affective theory of poetics. Once again, however, the point of departure is science.

The final definition then, so deduced, may be thus worded. A poem is that species of composition, which is opposed to works of science, by proposing for its immediate object pleasure, not truth . . . .

This is the Coleridge which, coupled with the concern for the "balance or reconciliation of opposite or discordant qualities," can lead, as
shown below, to the psychologistic theory of I. A. Richards.

For the most part, however, the poetic theories of the nineteenth century echo the expressive aspects of Wordsworth and Coleridge. As Alba H. Warren puts it, "the antithesis between science and poetry is a critical commonplace of post-romantic theory."\(^{58}\)

It is the natural point of departure in all theories which attempt a definition of the poetic essence, and the relationship is explored in all its facets, ends, materials, mode, faculty, function, and appeal. Its original formulation by Coleridge and Wordsworth is generally acknowledged by the critics, who add little if anything of their own.\(^{59}\)

However, with Arnold a somewhat different form of the dispute coalesces. For Arnold, in Aristotelian fashion, is opposed to poetry where the "expression predominates over the action."\(^{60}\)

But the modern critic not only permits a false practice: he absolutely prescribes false aims. "A true allegory of the state of one's own mind in a representative history," the poet is told, "is perhaps the highest thing that one can attempt in the way of poetry." And accordingly he attempts it. An allegory of the state of one's own mind, the highest problem of an art which imitates actions! No assuredly, it is not, it never can be so: no great poetical work has ever been produced with such an aim.\(^{61}\)

In many ways, Arnold is the forerunner of what has come to be called an "impersonal" or "objective" theory of poetry. Although the above quotation, because it suggests a mimetic function for poetry, would hardly square with contextualist theory, there is not much doubt that Arnold focuses his attention away from the poet. The poet succeeds when the poem is allowed to develop "without interruption from the intrusion of [the poet's] personal peculiarities."\(^{62}\) The poet's production is "most fortunate when [the poet] most entirely succeeds in
effacing himself . . . " Applying the Kantian formula of "disinterested interest," to the critical activity, and borrowing somewhat from scientific methodology, Arnold calls for a criticism which can "see the object as it really is." At issue once again, however, is the march of science. Murray Krieger is right when he asserts that "it is the development of modern science, with the revolutions it has forced upon our sense of man's place in the universe, that for Arnold has destroyed the possibility of faith." But if it is no longer possible to believe in religion, science having stripped it of its factual value, Arnold believes that "poetic truth and poetic beauty" will more and more offer to "the spirit of our race" the "consolation and stay" once afforded by religious belief. More and more mankind will discover that we have to turn to poetry to interpret life for us, to console us, to sustain us. Without poetry, our science will appear incomplete; and most of what now passes with us for religion and philosophy will be replaced by poetry. Science, I say, will appear incomplete without it. . . . our religion, parading evidences such as those on which the popular mind relies now; our philosophy, pluming itself on its reasonings about causation and finite and infinite being; what are they but shadows and dreams and false shows of knowledge? The day will come when we shall wonder at ourselves for having trusted to them, for having taken them seriously; and the more we perceive their hollowness, the more we shall prize "the breath and finer spirit of knowledge" offered to us by poetry.

It is as if Arnold is paving the way, offering a service, to prepare us for accepting the psychological value which only poetry will soon
come to foster.

The challenge of Thomas Henry Huxley is not hard to hear behind this view, prodding Arnold to come up with a justification for poetry's function, just as it is not hard to see Peacock spurring Shelley to validate poetry's use. Arnold, the champion of the "high seriousness" of "the best that is known and thought in the world," has been pressed by Huxley to justify the value of teaching the classics in the face of the utilitarian significance of scientific study. And Arnold, as Krieger points out, "is one with the positivists in conceding to laboratory-controlled science the sole access to truth." However, he can still argue for poetry's utility, for in awarding truth to science, he frees poetry from an "impossible competition" with science and gives to poetry a fictive status which can soothe the psyche and "unify our sensibilities without founding this power on supposed facts."

This movement toward an affective theory of art reaches its most elaborate form in I. A. Richards. Richards, too, feels the threat of science. "What is needed," he tells us in The Principles of Literary Criticism, "is a defensible position for those who believe that the arts are of value." And there should be little doubt that in attempting to arrive at this position he is heavily influenced by Arnold. In fact, he quotes Arnold on the opening page of Science and Poetry.

The future of poetry is immense, because in poetry, where it is worthy of its high destinies, our race, as time goes on, will find an ever surer and surer stay. There is not a creed which is not shaken, not an accredited dogma which is not shown to be questionable, not a
received tradition which does not threaten to dissolve. Our religion has materialised itself in the fact, in the supposed fact; it has attached its emotion to the fact, and now the fact is failing it. But for poetry the idea is everything.\textsuperscript{73}

Richards then admits some eight pages later, after quoting Peacock, that "many others . . . have thought that the inevitable effect of the advance of science would be to destroy the possibility of poetry."\textsuperscript{74} He is anxious to discover how "our estimate of poetry is going to be affected by science,"\textsuperscript{75} and realizing that making this discovery is dependent on first determining what poetry is, he admits that "until recently this preliminary task could only be very incompletely carried out" since "the psychology of instinct and emotion was too little advanced" and "the wild speculations natural in prescientific enquiry definitely stood in the way."\textsuperscript{76}

Richards's program is clear. It is the phrase "until recently" that is the focus. The plan is to use science to show in what way poetry is different from science; if science gives us truth, poetry must do something else. John Paul Russo points out in this connection that Richards's view of science and philosophy is heavily indebted to the attack on idealism of G. E. Moore.\textsuperscript{77} Believing in a referential truth, like Moore, Richards can state in his early essay "Art and Science" that science is "the systematic connection of propositions."\textsuperscript{78} In science, "when a proposition is true, there is, of course, a fact which corresponds,"\textsuperscript{79} but in art questions of referential truth value are not relevant. As much as Richards wishes to argue that "the world of poetry has in no sense any different reality from the rest of the
world,²⁰ (Principles of Literary Criticism) he is clearly lead, along somewhat Kantian lines overlayed with psychologicist theory, to posit a peculiar and non-referential value for poetry.

The realism of Moore, the affective elements in Arnold, and the awarding of "pleasure, not truth" to poetry through the "reconciliation of opposites" by Coleridge—all combine in Richards's theory. Statements, with truth value, are given to science; "pseudo-statements," with the power to balance a maximum number of apprentices in the reader, are given to poetry. Health of the human mind is determined by "the organisation of its impulses for freedom and fullness of life,"³¹ and it is through the arts that "the mind most easily and with the least interference organises itself."³⁴ Here lies the escape of poetry from competition with the rational and referential truth of science. Through an irony inherent in the "good" literary text, that text can "bring the whole soul of man" into a balanced harmony, reconciling opposites, and providing for the health of the individual. Poetry is good therapy.

To go beyond Richards is to move past the science/poetry dichotomy which was a legacy for the New Critics. Richards himself belongs to both the legacy and its reformulation. However, that the polarity between science and poetry was indeed an inheritance which the New Critics might refashion seems clear. The value of poetry is established through the romantic period, and then through Arnold and Richards, always in contradistinction to science. Science deals with "matters of fact" or "statements"; poetry, in contrast, is assigned a province of value either because of the subjective truth available through the appercep-
tive act or because of the unique social and personal utility which
poetry provides.

The New Enemies of Science

Although it is clear, as shown in the preceding section, that the
establishment of a dichotomy between science and poetry is far older
than the form it takes with the New Critics, it is equally true that
the opposition reaches its most emphatic form with the poetic theories
of the New Criticism. R. S. Crane, never really a friend to New
Criticism and sometimes shortsighted in his unwillingness to see the
valuable aspects of a language-oriented poetics, is, nevertheless, de-
scriptively accurate when he points, in 1948, to the "obsession of
these writers with the problem of justifying and preserving poetry in
an age of science."83

This has resulted [Crane continues] in an ex-
traordinary florescence of modern apologies of
poesy, the majority of which, in spite of much
diversity in the rhetorical topics, have turned
on the antithesis expressed in the title of one
of the most famous of them, science and poetry.
The question of the differences between poetry
and science is as old as the Greeks, but whereas,
with earlier critics, it was only one among many
problems—and, for most, a problem preliminary
to criticism proper—it has become, for our
contemporaries, the crucial issue upon the
successful resolution of which the fate of
poetry, and even of the humanities in general,
is thought to depend.84

The problem which the New Critics faced was clear. The poetic theories
which they had inherited were not immune to the aggrandizing powers of
science. Because in previous theories poetry was thought to be
grounded in something external to the poem itself, poetry was susceptible to a competition with the discovery procedures or the stimulus-response conditioning of scientific positivism. "Is it not easy to see," Allen Tate asks in Reason in Madness, "how such a poetics gives the case for poetry away to the scientists?" A new poetics, therefore, was to be posited, and like the previous theories, it too was to reflect the science/poetry opposition; this time, however, all possibilities for an unfair competition with science were to be canceled as poetry was to be seen sui generis, as a unique linguistic act, objective and impersonal.

The influence of Hulme and Eliot, as everybody now recognizes, was formidable in the development of this new poetics. Although both occasionally wandered from the view that the aesthetic value of poetry inheres in the linguistic product, both theorists provided the groundwork for such a view. Hulme, for example, prophesied a return to the "dry hardness" of classicism, a return to a poetry which eschews the constant "drag [ging] in of the infinite" which is so characteristic of romantic expressionism. "I object," he writes,

    even to the best of the romantic. I object still more to the receptive attitude. I object to the sloppiness which doesn't consider that a poem is a poem unless it is moaning or whining about something or other.  

Occasionally Hulme does lapse into what seems to suggest a decoration theory of poetry as when he applauds Bergson's theory of art and the notion that the poet has a unique capacity to pierce through the "veil" of ordinary perception and discover the vital flux of life.
... the big artist, the creative artist, the innovator, leaves the level where things are crystalized out into these definite shapes, and, diving down into the inner flux, comes back with a new shape which he endeavors to fix. He cannot be said to have created it, but to have discovered it, because when he has definitely expressed it we recognize it as true.  

But, despite such passages, there are others which suggest that the perception of the poet and the language used in the poet's creation are intimately united. "Fancy," he argues, "is not mere decoration added on to plain speech."  

Visual meanings can only be transferred by the new bowl of metaphor; prose is an old pot that lets them leak out. Images in verse are not mere decoration, but the very essence of an intuitive language. Verse is a pedestrian taking you over the ground, prose—a train which delivers you at a destination.  

This emphasis on the unique usage of language in poetry is to be the starting point for the New Critics.  

This same direction can be found in Eliot. Eliot's famous statement that "the poet has, not a 'personality' to express, but a particular medium, which is only a medium and not a personality" suggests that poetic theory should move away from a concentration on the insight and emotion of the poet, the hallmark of romantic theory, and focus its attention on the poem itself. Eliot, of course, also seems at times to wander from this insight, as in his theory of the objective correlative; here the implication is that the language of the poem is simply the translation of some preconceived emotion and, consequently, the "objective correlative" seems to harken back to expressive theories.
For this view he has been severely criticized by such members of the New Critical fold as Ransom, Brooks, and Eliseo Vivas. Despite such lapses, however, there are numerous passages in Eliot which clearly foretell the emphasis on the poem as an unique linguistic object. In *The Use of Poetry and the Use of Criticism* he writes, "if poetry is a form of 'communication,' yet that which is to be communicated is the poem itself, and only incidentally the experience and the thought which have gone into it."91 Or again, "... a poem is not just either what the poet 'planned' or what the reader conceives, nor is its 'use' restricted wholly to what the author intended or to what it actually does for readers."92 Here, quite clearly, is an argument at once against romantic expressive theories as well as the affective theory of Richards.

Richards too, however, is a pivotal figure. The general attitude toward Richards of such theorists as Ransom, Tate, and Brooks is one which applauds Richards's understanding of the importance which irony plays in poetry but one which laments his capture by the positivists. It is as if the very fact that someone of Richards's aesthetic sensibility could be lured into the positivists' camp is itself testimony to the danger inherent in the scientific milieu which increasingly threatens to invade every area of life. This is, obviously, Tate's attitude. Positivism has become a "movement" and "more than a strict scientific method."93

It is a general attitude towards experience. If it is not, why should Mr. Richards have attempted in his early criticism to represent the total poetic experience and even the structure of poetry in one of the positivist
languages—experimental psychology?  

"Mr. Richards like any good positivist," Tate goes on to say, "was the victim of a deep-seated compulsive analogy, an elusive but all-engrossing assumption that all experience can be reduced to what is actually the very limited frame of reference supplied by a doctrine of correlation, or of the relevance of stimulus to response."  

That Richards had a good idea about the balance of antimonies is clear; all that must be done is to get this balance out of the reader's mind and back into the poem for things to be set straight. And it was, of course, comforting to the New Critics to see such a movement in the later work of Richards himself. It implied a return to right thinking.

This is largely the movement of all three of the major theorists of the New Criticism—Ransom, Tate, Brooks. Although there are differences between them, as in Brooks's charge that Ransom pays too much attention to structure and "determinate" meaning, these differences are largely fears that the conception of the poem as an autotelic entity has not been stated firmly enough. All three of these critics begin by positing a radical difference between science and poetry and end by defining the poetical quality as being anti-referential (at least in any commonplace sense) and non-abstract. This is as clear in Ransom as it is in Brooks. Science, for Ransom, presents a clear and present danger to poetry. As he puts it in The World's Body, "in all human history the dualism between science and art widens continually by reason of the aggressions of science."  

Both the expressive and affective theories of poetry are inadequate to combat the "aggressions of science."
Art as utility is dealing with perfectly objective ends, and at the same time as expression is trying to please a perfectly subjective personality. And what is personality? It can only mean: whatever in the organism is responsible for whatever in the work of art is not utility. Personality is mentioned because the doctrine is not analytical enough to make out the form that expression takes but can remark sagely that something, probably something big, with about five syllables, is expressing itself. 97

In fact, "philosophers" have done too "little to distinguish the art from the science," and "in the meantime the sceptical scientific population,

perpetually on the increase, is rudely remarking that it does not believe in magic, and asking of the apologists of poetry to show what the poet has added to the scientific record except irrelevance and disorder. 98

Such passages which demonstrate the threat of science and the impasse which poetic theory has reached in attempting to clarify and combat that threat are repeated again and again in all of Ransom's work. Past poetic theories have failed to discern the real difference between science and poetry and thus have left poetry vulnerable.

The real difference rests in the way in which the world is rendered.

We have elected to know the world through our science, and we know a great deal, but science is only the cognitive department of our animal life, and by it we know the world only as a scheme of abstract conveniences. What we cannot know constitutionally as scientists is the world which is made of whole and indefeasible objects, and this is the world which poetry recovers for us. Men become poets, or at least they read poets, in order to atone for having been hard practical men and hard theoretical scientists. 99
Thus, the dichotomy between science and poetry resides not in the belief that poetry deals with the universal and science with the particular, as the romanticists would have it, but in the reverse. In *God Without Thunder* Ransom explains that "particulars are delightful things to contemplate, as the painter contemplates his landscape, or the lover his beloved, but science is practical and purposive and must deal strictly with some selected aspect of the particular which it encounters."¹⁰⁰ Art has what would seem an almost moral responsibility to respond to the denaturing activities of science by providing an encounter with the density of things in the world. The often quoted sentence in *The World's Body* summarizes Ransom's concern: "As science more and more completely reduces the world to its types and forms, art, replying, must invest it again with body."¹⁰¹ 

It is for this reason that Ransom must see the characteristic poetic quality of a poem residing in its "irrelevant texture." It is true that he often seems to get himself into some confusing muddles in discussing the interrelationships of "determinate" and "indeterminate" sound and meaning¹⁰² and that he is wary of the irrationalism which would deny logical structure to poetry; nevertheless, the differentiating characteristic of science and poetry, on which his whole argument is based, is one which assigns logical structure to science and both logical structure and "local texture" to poetry. Moreover, the hierarchy of the two elements is clear. The "reason" for having a "logical structure" is "in order to support a local texture."¹⁰³
The validity of a scientific discourse depends in part, we should say, on its semantical purity. That is, each symbol should refer to an object specifically defined, or having a specific value-aspect, for the discourse; and throughout the discourse it should have exactly that reference and no other. The reference of a single symbol is limited, and uniform.

On the other hand, "the poetic argument is not highly distinguished; it is comfortably general, and it is weakly regulatory. It is the member details that have all the distinction; they luxuriate, and display energy in unpredictable ways, going far beyond the prescription of the paraphrase."105

While we may not be able "to have the texture without the argument," it is finally "the texture we are after, not the argument."106 It is the use of language (metre, fiction, trope, metaphor) which calls the critic to the poem as poem and demands "a more ontological criticism."107

A similar poetics is promulgated by Allen Tate, and once again the point of departure is the radical difference between science and poetry. In fact, according to R. W. Stallman, "the disunity of the modern mind is the single theme of Tate's Reason in Madness. It is the scientism of our age that has forced out the religious attitude and reduced the spiritual realm to irrelevant emotion, under the illusion that all experience can be ordered scientifically."108 And indeed, Tate makes no attempt to camouflage his fear that science tends to infest all areas of culture and will ultimately act "as a powerful aid to the coming of the slave society."109 Against this movement toward tyranny stands poetry which, although a cognitive enterprise, is never
reducible to the methodological verification techniques of the scientific mind. In another context Tate argues that "poetry is not only quite different from science but in its essence is opposed to science." 110

Poetry

is neither the world of verifiable science nor a projection of ourselves; yet it is complete. And because it is complete knowledge we may, I think, claim for it a unique kind of responsibility, and see in it at times an irresponsibility equally distinct. The order of completeness that it achieves in the great works of the imagination is not the order of experimental completeness aimed at by the positivist sciences, whose responsibility is directed towards the verification of limited techniques. The completeness of science is an abstraction covering an ideal of co-operation among specialized methods. No one can have an experience of science, or of a single science. 111

Moreover, for Tate the scientist is dangerous for he is a "remarkably ingenious and dynamic fellow whose simple fanaticism brooks no compromise with his special projects." 112

The more immediate threat to the criticism of poetry for Tate is the scientific methodology of the literary scholar who seeks to verify the "meaning" of the literary work by investigating external qualities, a "method that dissolves the literature into its history." 113

The naturalism of the literary scholar is too obvious to need demonstration here; his substitution of "method" for intelligence takes its definite place in the positivistic movement which, from my point of view, has been clearing the way for the slave state; and the scholar must bear his part of the responsibility for the hypocrisy that will blind us to the reality of its existence, when it arrives. 114
This approach is based on what Tate calls the "fallacy of communication," a fallacy which posits "a poetry that communicates the affective state . . ."115 This view must come to see literature "as merely one among many forms of social and political expression,"116 and this "attempt to convert literature into science has done better than [simply suppress literature]; it has already extinguished it."117 It is a view that "began to prosper after 1798" and arose from the whole of romantic poetry. Since the romantic "poets were trying to use verse to convey ideas and feelings they secretly thought could be better conveyed by science . . .,"118 it is only natural that once this view of poetry is accepted one ceases to pay attention to the poem as a linguistic world unto itself and begins, despite "yearnings that come out of the humane tradition,"119 to undermine the very "significance" which literature offers.

This "significance" resides in the special use of language which poetry employs. Unlike science, which "demands an exact one-to-one relevance of language to the objects and the events to which it refers,"120 in poetry it is not possible "to distinguish the language from the subject" for "subject and language are one."121 Presenting the two terms, "extension" and "intension," (very similar to Ransom's "logical structure" and "local texture") Tate defines "the meaning of poetry [as] its 'tension,' the full organized body of all the extension and intension that we can find in it."122 Extension refers to the "abstraction of the object into a universal"; intention to the "dissenting ambiguities," or connotative meanings, which go beyond the paraphraseable meaning. The point here, as with Ransom, is that
the element of language which makes poetry different from science is the contextual interplay of its intensive possibilities. It is true that Tate, like Ransom, is afraid to dislocate the language of poetry from its referential function entirely—lest it lose its potential to relate to the world at all.\textsuperscript{123} Nevertheless, what seems to mark the difference between the language of science and the language of poetry is the possibility of the "intensive" function. Science, in other words, seems to be all "extension"; poetry has another linguistic function, which is different in kind, and it is this "intensive" function which marks poetry \textit{qua} poetry.

Nowhere is this view more highly and consistently pronounced than in the theory of Brooks. And, once again, the point of departure is the science/poetry split. Brooks tells us in "The Language of Paradox" that "the tendency of science is necessarily to stabilize terms, to freeze them into strict denotations; the poet's tendency is by contrast disruptive."\textsuperscript{124} For Brooks, "the terms of science are abstract symbols which do not change under the pressure of the context,"\textsuperscript{125} and it is against this definition that his conception of poetry is foregrounded. Probably no other critic borrows as heavily from Richards in this connection as does Brooks. The referential function of science remains fixed, but the emotive function of poetry is shifted and elevated so that the contextual interplay of the words in the text creates an "ironic" status and points to the unique "being" and poetic "truth" which resides inside the poem. "... the word, as the poet uses it, has to be conceived of, not as a discrete particle of meaning, but as a potential of meaning, a nexus or cluster of meanings."\textsuperscript{126}
"A scientific proposition," we are told, "can stand alone. If it is true, it is true."\textsuperscript{127} On the other hand, "one can never measure a poem against the scientific or philosophical yardstick for the reason that the poem, when laid along the yardstick, is never the 'full poem' but an abstraction from the poem."\textsuperscript{128} The reasoning does seem somewhat circular here in that Brooks implies that science and poetry are different since the former is abstract and the latter contextual, and, of course, this can't really be proved by simply denying, once again, that the abstract of the poem does not equal its "meaning." In fact, proving the legitimacy of the argument is difficult for Brooks since he must show how the poems he discusses are not reducible to mere prosaic renditions and since the only means he has to do so involve explaining the meaning of the poems. However, Brooks is struggling with a difficult concept, and he knows, perhaps more than Ransom or Tate, that to allow referential meaning is to allow "rational meaning" and this, as he candidly puts it, is to "bring the statement to be conveyed into an unreal competition with science . . . ."\textsuperscript{129}

Hence, the "heresy of the paraphrase." "Poems," for Brooks, "never contain abstract statements," for "any 'statement' made in a poem bears the pressure of the context and has its meaning modified by the context."\textsuperscript{130}

The "truth" of the statement, and of the poem itself in which it is imbedded, will be validated, not by a majority report of the American Association of Sociologists, or of physical scientists, or of a congress of metaphysicians who are willing to stamp the statement as proved. How is the statement to be validated? We shall probably not be able to do better than to apply T. S. Eliot's test: Does the statement seem to
be that which the mind of the reader can accept as a coherent, mature, and founded on the facts of experience. ¹³¹

This leads Brooks to see "the poem . . . like a little drama." ¹³² "It is not enough for the poet to analyse his experience as the scientist does, breaking it up into parts . . . ." ¹³³ The "task" of the poet "is finally to unify experience," ¹³⁴ and "the principle of unity which informs [the poem] seems to be one of balancing and harmonizing connotations, attitudes, meanings." ¹³⁵ This implies that a dramatic or presentational irony is the unifying form-content element, for "in a good poem, as in a good drama, there is no waste motion and there are no superfluous parts." ¹³⁶

In large measure then, those arguments of Brooks which seem to be offered as a corrective to someone like Ransom are really more indicative of what these critics have in common. All of these theorists—Ransom, Tate, Brooks—share a view of poetry which sees it as offering a unique, autotelic experience through the interplay of concrete contextual meanings. It is a view echoed somewhat less systematically by Robert Penn Warren ¹³⁷ and then championed by a second generation of theorists which includes Eliseo Vivas ¹³⁸ and, somewhat more searchingly, Murray Krieger and Hazard Adams. Moreover, in every case the theory is grounded in a view which sees poetry as a radically different enterprise from science. There is even a sense in which this dichotomy is so crucial to the definition of poetry that any suggestion of a mutuality between science and poetry seems to jeopardize the very existence and value of imaginative literature. Surely the passages quoted above suggest a fear that if poetry is placed in "competition"
with science, the result will be the denigration of poetry. And surely it is clear that, at least in some measure, this is a view which preceded the New Critics; the science/poetry opposition could be said to be the very cornerstone of much of modern critical thinking. It is a problem which the New Critics inherited and then refined into a poetics which offered the best defense against the growing acceptance of scientific method.

This is, of course, not to say that this view is wrong. It is difficult to know to what degree the poetics offered by these critics is the result of an inductively arrived at conclusion or a deductively applied principle. Surely, however, the latter possibility had some real impact. It is what R. S. Crane, in his criticism of the New Critics, called the "high priori road." Crane's argument is reiterated and summarized rather neatly by Gerald Graff in 1979: "It was not, according to Crane, that the New Critics were necessarily wrong in what they said about literature but rather wrong, the method by which they arrived at their generalizations and interpretations derived not from a genuine inquiry into the subject but from a deductive scheme formulated in advance." There is truth in this argument, for it explains the difficulty the New Critics had in encountering literary works other than the lyric poem as well as their difficulty in accepting as valuable even short poems which could not easily be shown to conform to the ironic mode. There is in these critics, it would seem, a certain blindness to the potential value of a literary work which does not reflect the science-referential/poetry-contextual framework. It may well be, to quote Gerald Graff again, that the
"problem of justifying poetry in a scientific age" was "permitted to dictate our understanding of what literature is or what a particular work means."  

It is almost as if the science/poetry dichotomy is so axiomatic to the definition of poetry that any attempt to collapse that dichotomy must be countered and defeated. It is perhaps for this reason that Krieger devotes so many pages in his review of the New Critics, in The New Apologists for Poetry, to an explication and refutation of D. G. James. Although Krieger is straightforward in his grappling with the inconsistencies of the New Critical theories, his exposition of those inconsistencies takes the form of a lament that they do in fact exist. At least, there should be no doubt that Krieger shares the fear that poetry must be defended against the growth of scientism. As Frank Lentricchia has recently observed, "if it is not clear to us from the table of contents in The New Apologists for Poetry who the enemy is-- poetry and science are opposed in every category--it is made clear very early in the book." Thus, since "James continually emphasizes the similarities rather than the differences in the operations of the imagination in poetry, in everyday life, and in science," Krieger may feel that he can make a real contribution by showing how James's argument is in error. The degree of Krieger's success is not really important here. (Basically, Krieger attacks James on several fronts at once, arguing that James misreads Kant and Coleridge and that finally James's own thesis can't ignore the difference between science and poetry.) What is telling to mention at this point is the importance which Krieger attaches to his refutation.
He concludes that "the similarities James finds among the poetic, scientific, and everyday uses of the imagination are insignificant, so that the opposition between science and poetry imposed by modern criticism is not seriously threatened."

The language here is revealing. The tone of this statement suggests a genuine relief that the enemy has been met and conquered.

It is also interesting to note how both Krieger and Hazard Adams can characterize the transformation of the science/poetry dichotomy from the expressive-oriented poetics of the nineteenth century to the contextualist-oriented poetics of the New Critical position. The romantic poets and theorists, we are told, viewed science as evidencing "truth to particular reality" and viewed poetry as evidencing "truth to the ideal and universal." The contextualist views this dichotomy in reverse. Clearly, Ransom is a good example of this shift. Of course, as M. H. Abrams points out, there were a good many romantic theorists who saw the science/poetry split in exactly the same way as the more modern theorists, suggesting that there was not as much of a shift as one might be lead to believe. Nevertheless, it is interesting that in Adams and Krieger's assumption that there is a legitimate reformulation of the dichotomy there is very little attention given to the role assigned to science. Krieger's language is telling: "Our critics [New Critics], then, equally anxious to distinguish science from poetry, have recognized, first, that the intellectual cannot be eliminated from poetry and, secondly, that in distinguishing poetry from science it is not poetry which has to be abstract and science concrete, but quite the other way around." One is inclined
to ask, what goes on here? Did the view of science change and did this cause a redefinition of poetry? Or did the view of poetry change, causing a redefinition of science? It seems as if the polarity between science and poetry is so firmly fortified that to define one term automatically necessitates the other term being defined in contradiction. Clearly, at least, there is too little attention paid to what science really is and does, especially if the definition of poetry is to depend so heavily on its being opposed to science. It seems a bit unfair to make science a counter which is moved wherever is convenient.

There are other problems which arise from this polarity, and, as Wendy Steiner observes, it "now fuels the controversy between structuralism." At the heart of these problems is how, given the New Critical position, poetry can relate meaningfully to the reader or the world. Krieger has been indefatigably honest in confronting these problems.

How can poetry tell us something about our world that we can learn nowhere else when for the contextualist it is not in any obvious sense referential? We have seen how great the cost of making poetry referential would be. If it were referential in the sense in which prose discourse is, then obviously what it would tell us about the world we could learn anywhere else. But if it were not referential, how could it tell us anything? If, like Richards, the contextual theorist assigns the referential to science, how, unlike Richards, can he allow poetry to have meaning?

These are indeed difficulties. The codification of the New Critical position in the "affective" and "intentional" fallacies presented by Wimsatt and Beardsley, for example, tends to cut the poem off from
both writer and reader, leaving it in a sort of vacuum; once this is done it is hard to see how the reader can ever arrive at an understanding of the poem at all. Moreover, once poetry is defined as radically anti-referential, it is difficult to escape from the Derridean argument that all language operates by nothing more than the (much wider) contextual interplay of signifiers. The two views, New Critical and post-structuralist, begin to echo one another. What is lost in the Derridean argument is that usage of language against which poetry can be defined as radically different. Poetry loses its privileged status. Moreover, if meaning is continually deferred through the differential systematicity of language, it becomes increasingly difficult to argue for meaningful presence in poetry, especially when one has posited a poetics which sees meaning in the poem as depending upon the inter-referential function of the poem’s words. The situation becomes oddly ironic with the New Critical apologist being almost forced to argue that univocal meaning can at least exist somewhere. If from the New Critical position it was hard to see how one could get from the closed linguistic system of the poem to the world beyond it, it is equally difficult from the Derridean position to see how one can get to the world beyond language used in any way whatever. The only difference is that in the latter position this "difficulty" is proclaimed with a joyous affirmation.

In any case, if the New Criticism was born in part from a dissatisfaction with the "dissociation of sensibility" which blossoms in the nineteenth century, it seems to have nurtured that dissociation rather than to have obliterated it. If the romantic vision entailed
a bifurcation into emotional and referential aspects, the New Criticism fostered a development of two different types of "cognitive" truth, only one of which was nested in the world of practical affairs; the other began to appear more and more as a separate realm, locked into a closed linguistic world. And strangely enough this view may have encouraged a methodology which assumed some of the characteristics of the science which it opposed in its inception.

-it-

The New Critics: Enemies of Science?

It may seem somewhat out of place, given the vehement attacks against science by the New Critics as explored in the last section, to raise the question of whether or not New Critical theory may in fact have affinities with science. Surely, one might think, the question can be put to rest, for surely there can be no doubt that the New Critics were eager to do battle with the hated scientism which they felt was creeping into every area of social and cultural life. Surely, the charge of being "scientific," one might argue, is best directed at New Critical opponents like E. D. Hirsch or at those literary theories which have sprung from the more analytically oriented methodologies of structuralism. After all, haven't the newer voices of literary criticism taken their departure from those who feel far more comfortable with the term "science" than did the New Critics. Saussure speaks of a "science of signs"; Levi-Strauss of a "science of myths"; Derrida of a "science of grammatology"; even Barthes speaks
of a "science of semiology" and at one point in his eclectic probings posits the legitimacy of a "literary science" which would see the literary work as a free entity capable of eliciting numerous interpretative values. All of this is true enough, and yet voices of opposition have been raised challenging that the New Critics, in "their assumption of the 'objective' nature of the literary text," as Gerald Graff explains it, "seemed . . . to represent a failure of nerve on the part of humanists in the face of the prestige of science and technology."152

The problem is a complicated one. In large measure it hinges on what the terms "science" or "scientific" actually mean, and since this is the province of the next chapter, most of the discussion of the nature of science must be postponed. For the moment, however, it may suffice to mention some of the characteristics of what is normally thought of as the role and attitude of classical science. Here what is meant is not "applied science" but rather "pure science"; the former is merely the technological application of the latter; the typical understanding of the latter, pure science, in its classical sense, is what is at issue, and here there are three characteristics which need mentioning. The first is that science tends to establish itself as a unique discipline. It establishes its own methodology in order to avoid being "tainted" by less systematic or less rigorous activities. Second, it stakes out its territory of study, so to speak, so that it can apply its methodology. That is, the object which it studies is circumscribed and set off from the means used in the study. The Cartesian subject-object separation is inherent to the methodology.
And third, it presumes that through the systematic study of the object a transcendental reality can be discovered and can be represented in a set of demonstrable laws. Such is the procedure used to discover the truth of the world.

That structuralism fits this model, both as methodology and ideology, is apparent. The Saussurean program—which, as every structuralist inevitably points out, is the origin and backbone of the structuralist project—is clearly designed to establish itself as a separate discipline. One of the purposes in setting up the dichotomies between parole and langue, the diachronic and the synchronic, and the syntagmatic and the paradigmatic is to raise up a scientific linguistics from the ashes of an historically oriented philology. Language is to be studied as system, and it is through this study that the separation of subject and object is completed. The synchronic langue becomes a self-determined and determining object available to elucidation by a knowing subject, who although as subject is determined by the object he studies—a consequence either skirted or admitted so readily that the study can quickly be resumed—is somehow able to discover the governing principles of the system. In its most rarefied (and Kantian) form the goal is to find the deep structuring principles of the mind and to represent them in demonstrable formula. Often, this goal reaches near completion with the fundamental law of binary opposition. In any case, as Jonathan Culler explains, "the system is not a chimera of the enthusiastic analyst."\(^{153}\) It actually exists apart from the subjective actualization of the system as well as the trained scientific eye which sees the system "as something to analyse."\(^{154}\)
"Linguistics [read structuralism] is not hermeneutic," Culler tells us; "it does not discover what a sequence means or produce a new interpretation of it but tries to determine the nature of the system underlying the event."\(^{155}\)

And it is, of course, in this sense that Culler has brought structuralism to Anglo-American poetics. Echoing the quotation above, Culler concludes that poetics "is not hermeneutic; it does not propose startling interpretations or resolve literary debates; it is the theory of the practice of reading."\(^{156}\) Indeed, Culler is fairly consistent. He is a commonsensical man who does not flinch in accepting Julia Kristeva's challenge that "semiotics cannot reify itself as a science."\(^{157}\) The discipline which Culler's structuralist poetics has carved out is the study of literary competence where "the work is read against the conventions of discourse and where one's interpretation is an account of the ways in which the work complies with or undermines our procedure for making sense out of things."\(^{158}\) It is a study of the ways in which a work "becomes intelligible"\(^{159}\) and as such allows its object to become separable from the investigating subject.

The subject who reads is constituted by a series of conventions, the grids of regularity and intersubjectivity. The empirical "I" is dispersed among these conventions which take over from him in the act of reading. Indeed, it is precisely because competence is not coextensive with the individual subject that the notion is required.\(^{180}\)

Thus, it is not difficult to see why the structuralism which Culler appropriates, filtered as it is through Chomsky's linguistics with all of its overtones of scientifically oriented methodology, is so
appealing.

To make the implicit explicit is the task of both linguistics and poetics, and generative grammar has placed renewed emphasis on two fundamental requirements for theories of this kind: that they state their rules as formal operations (since what they are investigating is a kind of intelligence they cannot take for granted intelligence used in applying rules but make them as explicit as possible) and that they be testable (they must reproduce, as it were, attested facts about semiotic competence). 161

Although at the end of *Structuralist Poetics* Culler seeks to save his system from a "version of formalism" which would "fix the text and reduce it to a structure." 162 it is difficult to see how such words can overcome the more predominant thrust of the book. In the end, literature seems a sort of empty form which is filled with meaning by both author and reader (with clearly more emphasis on the latter) in accordance with literary conventions and norms which, happily, are subject to scientific analysis.

It is as if Culler and E. D. Hirsch are flip sides of the same coin. When Culler says that "bringing someone to understand a text or to see an interpretation requires shared points of departure and common mental operations," 163 one can't help but be reminded of Hirsch's normative hermeneutics. Both men seem to share a faith in the possibility of discovering the "right reading." For Hirsch this reading follows the discovery of the intention of the author, as cultural subject, and is submissible to verification: thus "validity in interpretation." For Culler this reading follows the actualization of a system of cultural and literary conventions and it too is subject to verification since reading is "not an idiosyncratic and hap-
hazard process." Thus while Hirsch does not want reader "values" to intrude on the discovery of authorial "sense," Culler does not want the "individual subject" to replace the "abstract and interpersonal construct," which, situating meaning within a closed system of conventions and literary langue, allows the accomplishment of "what is the fundamental demand of the system: the demand for sense."

It may seem strange to yoke Hirsch and Culler together and perhaps even stranger to suggest, moving closer to New Critical frontier, a similarity with Northrop Frye, but the parallel in "scientific" impulse in unmistakable. Culler, in fact, quotes Frye approvingly.

"Everyone who has seriously studied literature," Northrop Frye maintains, "knows that the mental process involved is as coherent and progressive as the study of science. A precisely similar training of the mind takes place, and a similar sense of the unity of the subject is built up." If that seems overstated it is no doubt because what is explicit in the teaching of science usually remains implicit in the teaching of literature.

And, of course, Culler, like Frye, wants to make the "implicit explicit." Indeed, Culler shares that facet of Frye's program which Geoffrey Hartman has classified as "scientific," holding "that the criticism of literature should be pursued as a coherent and systematic study, which, like mathematics, has elementary principles explainable to anyone." Culler himself admonishes that "if we are to make sense at all of the process of literary education and of criticism itself, we must, as Frye argues, assume the possibility of 'a coherent and comprehensive theory of literature, logically and scientifically organized' . . . ."
Yet Culler, intent as always on "formulating the internalized competence which enables objects to have the properties they do for those who have mastered the system," realizes that the "status of Frye's taxonomic categories is curiously indeterminate."

Culler's simultaneous attraction to and disappointment with Frye's program is probably illustrative of the fact, in Frank Lentricchia's words, that "Anatomy of Criticism is poised crucially in 1957, looking at once backward to traditions in poetics of which it is the culmination, and forward to post-modernist responses to those traditions." On the one hand, Frye is anxious to show "that there is a finite number of valid critical methods, and that they can all be contained in a single theory." This goal is based on Frye's recognition that "the presence of science in any subject changes its character from the casual to the causal, from the random and intuitive to the systematic, as well as safeguarding the integrity of that subject from external invasions."

Frye sees the need to establish a rigorous and separate discipline because "it is clear that the absence of systematic criticism has created a power vacuum, and all the neighboring disciplines have moved in." Of course, like all disciplines, this one must define its object; "literature is not a subject of study," Frye tells us, "but an object of study." For Frye, the scientific approach to criticism must have as its "first postulate," "the same as that of any science," "the assumption of total coherence." Frye recognizes the need to "see literature . . . . as spread out in conceptual space from some kind of center that criticism could locate." Once
the object is conceptualized, it is then possible to discover the formula around which it rotates. "The first step in developing a genuine poetics is to recognize and get rid of meaningless criticism, or talking about literature in a way that cannot help to build up a systematic structure of knowledge." Of course, Frye's Anatomy, as the title implies, is designed to provide such "schematization." But despite the emphasis on mythoi, conventions, archetypes, and genres (and all of the Aristotelian mimetic talk), ultimately Frye cannot jettison the notion of a unique aesthetic consciousness (and the New Critical notions he attacks) and return literature to a cultural and historic setting. As Lentricchia notes, the Anatomy of Criticism frustrated "the hope for demystification as it never had been frustrated before." It is obvious what receives the greatest value in Frye's system: "the anagogic view of criticism . . . leads to the conception of literature as existing in its own universe, no longer a commentary on life or reality, but containing life and reality in a system of verbal relationships." Although literature has both a "centrifugal" and "centripetal" function, it is clearly the latter for which Frye reserves greatest praise.

In all literary verbal structures the final direction of meaning is inward. In literature the standards of outward meaning are secondary for literary works do not pretend to describe or assert, and hence are not true, not false, and yet not tautological either, . . . .

Wherever we have an autonomous structure of this kind, we have literature. Whenever this autonomous structure is lacking, we have language, words used instrumentally to help human consciousness do or understand something else.
This is the New Criticism raised to its zenith. How Kantian such passages as the following sound:

> The contemplation of a detached pattern, whether of words or not, is clearly a major source of the sense of the beautiful, and of the pleasure that accompanies it.\(^{185}\)

Understanding a poem literally means understanding the whole of it, as a poem, and as it stands. Such understanding begins in a complete surrender of the mind and senses to the impact of the work as a whole, and proceeds through the effort to unite the symbols toward a simultaneous perception of the unity of the structure.\(^{186}\)

When Frye argues that "all paraphrases abstract a secondary or outward meaning,"\(^{187}\) it is indeed difficult to credit his rejection of the New Critical sensibility.

However, if the New Critics had difficulty in locating a meaningful referential function in poetry, Frye escapes the problem finally by denying its existence. He becomes the purest of formalists. If he began by arguing that criticism must establish itself as a separate discipline, he ends by collapsing such distinctions. There is finally but one:

> ... all structures in words are partly rhetorical, and hence literary, and that the notion of a scientific or philosophical verbal structure free of rhetorical elements is an illusion. If so, then our literary universe has expanded into a verbal universe, and no aesthetic principle of self-containment will work.\(^{188}\)

But, indeed, it is only the "aesthetic principle of self-containment" that will work, for finally, although "literature, like mathematics, is constantly useful, ... pure literature, like pure mathematics, contains its own meaning."\(^{189}\) We are reminded of the rarefied air of
the anagogic phase where "poetry unites total ritual, or unlimited social action, with total dream, or unlimited individual thought. Its universe is infinite and boundless hypothesis."\textsuperscript{190}

However, this apparent "dualism," so neatly detailed by Lentricchia, may not be such an antithesis as it seems. It may be that the scientific impulse and the establishment of a separate aesthetic realm actually blend rather nicely. Only when the literary universe becomes self-contained, is it susceptible to scientific scrutiny. Geoffrey Hartman, for one, seems to hint at the connection in his criticism of Frye's "sweet science." Hartman realizes that Frye's attitude toward the fact that literature unfolds in time rather than quasi-simultaneously in space is puzzling. It would be possible to apply his type of analysis to the visual arts as well as to the verbal, for he stands\textsuperscript{191} back from poem or play as from a picture.

Lamenting the "disjunction between our immediate experience of literature, which is guided by the tempo of the work, and criticism, which lays out the completed pattern spatially,"\textsuperscript{192} Hartman also recognizes that this "disjunction is presented as fundamental to the establishment of criticism as a progressive body of knowledge."\textsuperscript{193} It is precisely with this same equation that the charge of "scientism" leveled at the New Critics finds its ground.

William Spanos, for example, sees the New Criticism as affirming a "commitment to . . . positivistic time"\textsuperscript{194} in its tendency to view poetry as an "autonomous" aesthetic realm. At the heart of this commitment, in Spanos's eyes, is the "spatialization of time."
The tendency of the New Criticism to collapse the distinction between the plastic and the literary arts and thus to argue in behalf of the aesthetic doctrine of simultaneous perception is itself an ontological commitment— one analogous to and probably having its specific source in the obsessive effort of the modern literary imagination to escape the destructive impact of time and change, of which a disintegrating cosmic order has made it acutely and painfully conscious, by way of achieving the timeless eternity of the aesthetic moment or, rather, of "spatial form." 195

Relying heavily on the relationship between the New Critics, the "impersonal" theory of Eliot, and the theory of "geometrical" form promulgated by Hulme, Pound, and the Imagist school, Spanos argues that the New Critics "tend to 'look at' the work as if it were a static visual object" 196 and that despite "their desire to secure the integrity of literature," they end by denying its essential humanizing quality. Spanos clearly speaks from a phenomenological—Heideggerian—stance; he tends to see far more relationship between the New Critics and the "non-temporal or ahistorical world of structuralism" 197 than one might expect. And Spanos scores some telling points.

He points out, for instance, that "for all Cleanth Brooke's insistence . . . that a poem is 'dramatic,' the critical method he employs pays remarkably little attention to the temporal sequence, the process of events embodied in its verbal expression." 198 The "doctrine of autonomy," so important to the New Critics, allows the "aesthetic object" to be set apart from the reader; indeed, it "insists on the negation of the reader's subjectivity." 199 This allows, Spanos realizes, a "privileged status" to the interpreter and "justifies in the name of disinterestedness (and the autonomy of the text) the transformation
of the be-ing of a text into a spatial form . . . ."²⁰⁰ Spanos be-
lieves a "defining impulse to objectify" to be behind the "ironic/
inclusive mode of the 'Neo-Kantian' modern cirticism," "the myth critic-
ism of Northrop Frye and . . . the structuralist imperatives of Levi-
Strauss.²⁰¹ This tendency to cultivate the belief that the critic is a neutral and "omniscent" observer who can apply his methodology to the literary text is, as Spanos puts it, "too often . . . part of a quixotic--and dangerous--strategy to apply scientific principles of measurement to the study of art . . . ."²⁰²

Another charge that the New Critics emulated the "scientism" they sought to reject comes from Richard Palmer. Arguing from a phenomeno-
logical (or dialogic) stance, Palmer also points to the "impersonal" or "objective" aspects of New Critical theory. For Palmer, "the prelimi-
nary separation of subject and object, so axiomatic in realism, becomes the philosophical foundation and framework for [New Critical] inter-
pretation."²⁰³ Palmer suggests that "the image of a scientist taking an object apart to see how it is made has become the prevailing model of the act of interpretation."²⁰⁴ The basis of Palmer's argument is that in defining the ontological status of the text as an autonomous realm, albeit an aesthetic realm, the New Critics removed the reader function from the work and set up a methodology allowing the text to be approached with the "restrictions of scientific objectivity."²⁰⁵ His criticism is hardly benign.

For, with all its humanistic pretensions and flamboyant defenses of poetry in an "age of technology," modern literary criticism has it-
self become increasingly technological. More and more, it has imitated the approach of the scien-
tist. The text of a literary work (despite its autonomous "being") tends to be regarded as an object—an "aesthetic object." The text is analyzed in strict separation from any perceiving subject, and "analysis" is thought of as virtually synonymous with "interpretation."^{206}

Although Palmer allows that the "New Criticism constitutes in some ways an exception" to this tendency for literary criticism to become "technological," these "ways" finally seem minor; on the whole, he sees it as "scientific method in disguise."^{207}

The same charge, although launched from a somewhat different stance, is brought by David Bleich. Bleich suggests that "in becoming a university subject and a widespread professional enterprise, criticism found it had to account for itself, beyond the ministerial activity of bringing the masterworks to the masses."^{208} Thus, being faced with the need to forge a separate discipline, the New Criticism accomplished the institutional task by "emphasizing the scientific attitude, careful reading, and the objective autonomy of the work,"^{209} The methodology of the New Criticism, for Bleich, involved an "imitation of the prestigious physical sciences and in reaction to previous work, like critical impressionism."^{210} Such attacks as Bleich's suggest that literary criticism has come full circle, with the New Critics being charged with the same heinous crime they leveled at their forebears. It is as if the enormity of the crime of being "scientific" is equaled only by the lure of science's seductive powers.

Of course, some of the impetus for what appears to be such stringent attacks of one group by another is the result of critical
polemics, which always have a tendency to divide differing perspectives into armed camps. (And academic prestige is a motivating factor as well; witness the battles between the New Critics and the neo-Aristotelians.) This, no doubt, accounts in part for the attacks against science by the New Critics; they felt they were under siege themselves. This is obviously the case with the Shelley-Peacock disquisitions and is exemplified in the more recent skirmishes of C. P. Snow and F. R. Leavis.211 Something of the same sort occurs in diluted form with the exchanges between René Wellek and Gerald Graff in Critical Inquiry. Graff's charge that the New Critics were ambiguous in their dual assertions of literature's formal autonomy and its cognitive referentiality seems far more tolerant before Wellek's rebuff.

And Wellek's "unqualified apology" (the term is Graff's) for the New Critics is interesting in itself, for it is not only one of the most recent attempts to extricate the New Critics from the charge of "scientism," but it also contains within the space of its few pages several statements which support the very charge itself. Wellek is quite adamant, for example, when he says that "the allegation that the New Critics want to make criticism a science is . . . preposterous."212 Yet he can say some three pages later that the "structuralists . . . have some affinities with the New Criticism in their concern for a microscopic analysis of texts and a general poetics."213 Perhaps the term "microscopic analysis" is an unfortunate choice, but it is there, with all of its "scientific" connotations; it clearly echoes Palmer's charge. Moreover, what is one to do with
Wellek's feeling that "the New Criticism surely argues from a sound premise, that no coherent body of knowledge can be established unless it define its object." It may be a sound premise, but it is, none-the-less, a scientific premise as well. Wellek laments "the uphill fight" which was necessary to establish criticism as a separate discipline, and his suggestion that the "object of literary study" (i.e. the "structure of norms which prescribes a right response") "need not be conceived of as static or spatial in any literal sense" seems a rather rhetorical response to Spanos or Hartman in light of the fact that "terms such as the well-wrought urn, or Joseph Frank's spatial form, or Wimsatt's verbal icon suggest such a misrepresentation."  

On the whole, there is probably a good deal of truth to the charges of Spanos, Palmer, and Bleich. If Graff can admit "... it is true that the New Critical method of interpretation begins to look very much like a form of scientism, an attempt to imitate the empirical scientist dissecting specimens and examining them under a microscope in his laboratory," it may not really matter if this is true only when "examined apart from" the "complicated cultural, educational, and polemical considerations which caused this method to come into being in the particular period of history in which it did." This seems merely to suggest an explanation of what the New Critics thought they were doing or of the cultural and educational milieu that they reacted to. That those are important considerations is undeniable, but they do not necessarily alter the nature of the methodology that New Criticism helped to create and sustain within academic institutions. That the New Critics may have ushered
in a critical stance which some now condemn as "scientific" is indeed ironic, but that in itself hardly indicates those who would level the charge are in error.

Graff's suggestion that "to view New Criticism as a form of scientism is to have no way of accounting for the persistent condemnations of science, often couched in vituperative language, running throughout New Critical writing" seems especially weak. It is really the same defense as Wellek's. In the first place, it is a wise man who pays close attention when anyone offers "persistent condemnations," especially when they are "couched in vituperative language." Sometimes such attacks are the result more of envy than of rejection. That the New Critics feared science is clear; that they may have been somewhat in awe of science is more problematic, but not unlikely. Moreover, there is a thread of realism which runs throughout these critics. Examine Brooks's assertion that "a scientific proposition can stand alone. If it is true, it is true." There is a sense in which these critics were always willing to allow one kind of objective truth to science and then struggled hard to establish poetry as offering another kind of objective truth, separate but equal (or better).\(^{217}\)

What is more at issue, however, is the nature of the critical act. To say a phenomenologically-based argument that the New Criticism was scientific is in error, because it fails to account for the New Critics' negative attitude toward science, misses the whole point. If one assumes the objectivist's stance, one can argue that poetry
and science are radically different and still allow the critical act to be as "scientific" as one wants. If, on the other hand, one assumes that the act of interpretation is in some sense synonymous with the poem itself, one cannot maintain that poetry is radically different from science, but that the critical act can approach scientific method, without being inconsistent. Thus, there is a lot of talking at cross purposes, and this is complicated by the fact that the question of science seems to be a rather emotionally charged subject.

-i-

Conclusion

What is at stake here is more than the simple division of knowledge into separate disciplines. This is indeed a factor, and the impulse toward separatism may be more of a cause of theoretic differences than it is an effect, as anyone who has witnessed the committee-structured bureaucracy of the modern university system can testify. Financial exigencies and administrative turf battles may have more to do with the justification of pedagogical needs than is commonly and openly admitted. Moreover, such practical needs may, at times, be more causative of the establishment of insulated disciplines and departments of unique study than they are the result of legitimate theoretic differences. At the least, pragmatic needs for pedagogical justification obviously have some effect upon the establishment of separate areas of study and can only rather naively be separated from theoretic arguments.
Nevertheless, the antithesis between science and poetry goes beyond this. It has a long history and is so crucial to the definition of literature and literature's value that to reduce it to intra-university warfare would be an oversimplification. At the heart of the controversy are some important epistemological questions. Does meaning reside in universals or particulars, in wholes or parts? What does it really mean if the discovery procedures of science are set in contradistinction to the hermeneutic process of textual interpretation? If intentionality and interpretation are denied as constitutive of meaning in the text, can a text be truly meaningful? In positing poetry as radically different in kind from other forms of symbolic formulation is there a danger that literature will become so isolated from life and the world that it begins to lend itself to "scientific" manipulation and thus lose the very privileged status originally sought? Is such a thing as a timeless, "spatial conceptualization" of meaning valid, either in poetry or science? And paralleling this last, are the systematicities of language, either in their structuralist or logical positivist formulations, ever free from their particular and temporal actualization?

It is ironic that, in attempting to answer these questions, philosophical critical theory has often cut itself off from a science which struggles with these same questions, or ones very similar. This often results in the emulation of an outmoded scientific model or in the rejection of a chimerical antagonist. Nowhere is this truer than in those stances which seek to reinvigorate the argument for language's poetic power to mean for man. This is doubly
ironic in that at the very time when New Critical theorists were
strengthening and refashioning the romanticist rejection of science,
science itself was undergoing a radical change. In fact, in its
attempt to interpret the Baconian "Book of Nature," the hermeneutics
of modern science may prove to be more of a colleague in the humanist's
desire to collate order and freedom than it is an enemy. But that is
the subject of the next chapter.
END NOTES


2. Ibid.


5. Ibid.


7. Steiner, p. 257.

8. This is, in fact, the way David Daiches sees it. See Critical Approaches to Literature (Englewood Cliffs, N.J., 1956).


10. Ibid.


14. Hazard Adams, The Interests of Criticism: An Introduction to Literary Theory (New York, 1969), p. 84. It is clear that for Adams the enemy to poetic theory has been science. No other critic, unless it be Murray Krieger, is as determined as Adams to set literary theory in opposition to science.


21 Ibid., pp. 496-497.


27 Wordsworth often exemplifies this view, particularly in his earlier years.

28 See M. H. Abrams, *The Mirror and the Lamp*, particularly Chapter XI.

29 Wimsatt and Brooks, p. 425.

30 Ibid., p. 370.


33 Kant, p. 397.

34 Ibid., p. 397.

36 Kant, p. 398.
39 Ibid., p. 55.
41 Gadamer, p. 75.
42 Ibid., p. 71.
43 Adams, p. 67.
45 Ibid., p. 49.
46 Ibid., p. 49.
47 Ibid., p. 52.
48 Ibid., p. 52.
49 Ibid., pp. 57-58.
54 Ibid., Vol. II, p. 11.
57 Ibid., p. 8.
59. Warren, p. 11.


61. Ibid., p. 579.

62. Ibid., p. 579.

63. Ibid., p. 579.


67. Ibid., p. 596.

68. Ibid., p. 596.


70. Ibid., p. 141.

71. Ibid., p. 141.


73. Quoted from Science and Poetry (New York, 1974).


75. Ibid., p. 8.

76. Ibid., p. 9.


79. Ibid., p. 702.

80. Richards, Principles of Literary Criticism, p. 78.
81 Ibid., p. 132.
82 Richards, Principles of Literary Criticism, p. 133.
83 R. S. Crane, "The Critical Monism of Cleanth Brooks," in Critics and Criticism: Ancient and Modern, ed. R. S. Crane (Chicago, 1952), p. 105. Crane refers to this "obsession" as "morbid." I have left this out of the quote because it suggests a somewhat personal reaction and is probably more the result of the competition between the neo-Aristotelians and the New Critics for academic supremacy than it is indicative of descriptive accuracy. Clearly, however, the charge of "obsession," although an emotionally charged term, is not far off the mark.
84 Ibid., p. 105.
88 Hulme, "Romanticism and Classicism," p. 773.
89 Ibid., p. 773.
92 Ibid., p. 21.
93 Tate, "Literature as Knowledge," p. 54.
94 Ibid., p. 54.
95 Ibid., p. 54.
97 Ibid., p. 309.
98 Ibid., p. 310.
99 Ibid., pp. x-xi.
100 Ransom, God Without Thunder (New York, 1930), p. 221.


102 See Ransom's The New Criticism (Norfolk, Conn., 1941), particularly pp. 297-313.

103 Ibid., p. 269.

104 Ibid., pp. 290-291.

105 Ibid., p. 270.

106 Ibid., p. 271.

107 Ransom, The World's Body, p. 139.


109 Tate, Reason in Madness, p. 7.

110 Tate, "The Aesthetic Emotion as Useful," This Quarter 5 (1932), p. 292.

111 Tate, Reason in Madness, pp. 59-60.


113 Ibid., p. 10.

114 Ibid., p. 9.

115 Ibid., p. 71.

116 Ibid., p. 10.

117 Ibid., p. 10.

118 Ibid., p. 65.

119 Ibid., p. 19.


121 Ibid., p. 25. It should be noted that what I have rendered in declarative form is presented by Tate as a series of questions. The questions, however, are clearly rhetorical.

122 Ibid., p. 72.
See Murray Krieger, *The New Apologists for Poetry* (Minneapolis, 1956), pp. 88-89. Krieger wishes to point out the inconsistencies in the theories of both Ransom and Tate. "How can the poem have, as we shall see it must have for these critics, a contextually autonomous status when one of the two components which make up its tension cannot relinquish its denotative precision . . .?" Krieger's point is well taken, but it is not relevant to the point made here. The theoretic thrust of these critics, as the Krieger passage itself makes clear, is to demand that the poetic use of language be non-referential. That they are not as consistent as Brooks does not detract from the fact that they move in the same direction as does Brooks.


Ibid., p. 207.

Ibid., p. 203.

Ibid., p. 201.


Ibid., p. 233.

Ibid., p. 232.


Ibid., p. 212.

Ibid., p. 195.


See Eliseo Vivas, *Creation and Discovery* (New York, 1955), particularly pp. 120-121.

144 Ibid., p. 103.
145 Hazard Adams, Interests of Criticism, p. 87.
146 Abrams, The Mirror and the Lamp, see particularly pp. 315-317.
147 Krieger, New Apologists, p. 141.
150 See W. K. Wimsatt, Jr., The Verbal Icon (University of Kentucky Press, 1954).
154 Ibid., p. 31.
155 Ibid., p. 31.
156 Ibid., p. 259.
157 Julia Kristeva, Semiotike, quoted in Culler, Structuralist Poetics, p. 251.
158 Culler, Structuralist Poetics, p. 130.
159 Ibid., p. 123.
160 Ibid., p. 258.
161 Ibid., p. 122.
162 Ibid., p. 261.
163 Culler, Structuralist Poetics, p. 258.
164 Ibid., p. 258.
165 Ibid., p. 258.
166 Ibid., p. 123.

167 At several places in After the New Criticism Frank Lentricchia does link these three figures together. He also occasionally brings in references to Shelley in this connection. This is interesting, particularly in light of J. Bronowski's argument that Shelley "held vaugely to poetry because he liked it," but that "his faith was in science because he was in awe of it." See J. Bronowski, The Poet's Defense (Cambridge, 1939), pp. 57-86.

168 Culler, Structuralist Poetics, p. 121.


170 Culler, Structuralist Poetics, p. 122.

171 Ibid., p. 121.

172 Ibid., p. 121.


175 Ibid., p. 7.

176 Ibid., p. 12.

177 Ibid., p. 11.

178 Ibid., p. 16.

179 Ibid., p. 17.

180 Ibid., p. 18.

181 Ibid., p. 27.

Frye, p. 122.


Ibid., p. 74.

Ibid., p. 77.

Ibid., p. 77.

Ibid., p. 350.

Ibid., p. 351.

Ibid., p. 120.


Ibid., p. 33.

Ibid., p. 33.


Ibid., p. 91.

Ibid., p. 89.

Ibid., p. 98.

Ibid., p. 89.

Ibid., p. 96.


Ibid., p. 128.


Ibid., p. 6.

Ibid., p. 159.

Palmer, Hermeneutics, p. 6.

207  Ibid., p. 7.


209  Ibid., p. 330.

210  Ibid., p. 330.

211  See C. P. Snow, The Two Cultures and A Second Look (Cambridge, 1964) and F. R. Leavis, Two Cultures? The Significance of C. P. Snow (London, 1962).


213  Ibid., p. 622.

214  Ibid., p. 620.

215  Ibid., p. 620.


217  Ransom is something of an exception to this, particularly in God Without Thunder. Ransom is most enamored with Hume's charge that science is a subjective construct and he is anxious to label science a "fiction." In so doing, he shows a more thorough acquaintance with science, particularly mathematics, than do Tate and Brooks. For the most part, however, his attack is launched from the outside of science.
CHAPTER THREE: THE CONSCIOUSNESS OF A NEW SCIENCE

Most scientists felt in 1930 that philosophers had just caught up with nineteenth-century physics, and were trying to make it the model for all knowledge, at the very moment when physicists had painfully discovered its shortcomings.

Scientists were actively trying to break out from the aura of impersonality and even inhumanity with which tradition had hallowed their work and awed the public. And here they were to be herded back to the ancient postures, because philosophers were trying to construct a system of science which positively aspired to be impersonal and inhuman.

--Jacob Bronowski

-1-

A New Science: The Ontological Dimension

"Have you been told that science is dogmatic?"¹ Jacob Bronowski first asked this question in 1948, and he continued to ask it until the time of his death in 1974. He did so because he knew that the answer was "yes," that, as he said in 1955, "the public still pictures nature as the first scientific revolution did, as an engine."² Bronowski knew that this answer is wrong. He knew that if there is but one thing the second scientific revolution should teach us it is that science is not dogmatic but, as he came to put it in 1974, "tolerant."³ He knew that since 1900 "there is not a field of science which has not been made over from top to bottom,"⁴ and he knew that while "historians are just learning to speak easily of the first scientific revolution in the sixteenth and seventeenth centuries,"⁵ "the second scientific revolution is already long on the move."⁶ Bronowski lamented that
most people have come to "think by habit of nature as a causal, continuous and independent mechanism, which thumps along inexorably while we peck or goggle at it." This, however, is no longer the scientist's picture; but it has now become, by an ironic transfer, the popular picture of a scientist. It lends itself to the basic totalitarian tricks which exploit the insecurity of the ignorant: an awe of the specialist, a hidden hatred of him, and a cleft between his way of thinking and theirs.

In one way or another all Bronowski's writings are attempts to expose and overcome this irony.

Nowhere is this irony more highly pronounced than in the field of literary interpretation. To begin to expose this irony was, in fact, one of the goals of the previous chapter. There it became clear that the literary theorist typically maintains an "awe" and a "hatred" of scientists and that he is lured to proclaim "a cleft between his way of thinking and theirs." It also became clear how dangerous the three parts of this irony, when taken together, can be, for in the very act of rejecting the "scientific" model it becomes increasingly possible—perhaps even attractive—to emulate it. The irony thus becomes doubly compounded and even triply so when one realizes that to follow the newer scientific model necessitates the denial of the subject-object schema upon which much of modern critical theory is predicated. Science in the twentieth century, as Bronowski puts it, "does not picture the world as given and the scientist as a neutral observer outside it. Science here is an activity within the world it pictures, and the activity cannot be taken out of the picture; it
limits and shapes it, together." To show this is to expose the irony completely. It is not only to defend science from the attacks of those who misleadingly challenge it for its stultifying objectivizing; it is also to suggest that scientific discovery may indeed be instructive for literary criticism.

This task, however, is not easy. One of the major difficulties is language itself. It is perhaps another irony that physicists are constantly bemoaning the difficulty of translating the insights they think they have articulated in mathematical formulae, much of which defies classical logic and one-to-one correspondence rules, into the concepts which can be articulated in ordinary language. They feel compelled to do so, however, so that they may be better able to understand the relationship between these insights and the world as they have known it. "Even for the physicist," Werner Heisenberg writes, "the description in plain language will be a criterion of the degree of understanding that has been reached." He goes on to remark, however, that "the problems of language here are really serious." These problems, moreover, are exacerbated when explanations are to be given by a layman, as is the case here. The risks of inaccuracy are obvious. It is best, therefore, to focus only on major theories of twentieth-century physics. These will suffice to establish that the ontological dimension of modern science implies the attenuation of the subject-object dichotomy and the positing of an interconnected or nexical universe. The place to begin is with the Einsteinian revolution of relativity.
In many ways Einstein is a transitional figure; on the one hand, he heralded a conception of the universe which overthrew the Newtonian or classical view; on the other hand, he refused to abandon the classicist's belief in the possibility of absolute certainty and objectivity. This, too, is ironic, for the discoveries of microphysics, many of which Einstein never accepted, could not have come about without his initial steps. In some ways the most recent developments in physics may prove to accommodate Einstein's faith in an ordered universe, but if they do—and that is by no means certain—they hardly allow for an objectively certain knowledge. It is very unlikely that physics is ever to return to a pre-Einsteinian worldview.

The impact which Einstein's three papers had on the scientific community in 1905 was devastating. If the "new philosophy" of the Cartesian-Newtonian system proclaimed in the seventeenth century called "all in doubt" for John Donne, something of the same sort happened in 1905 for those scientists who were comfortably applying Newtonian principles to technological problems. It is today difficult to appreciate the composite of excitement and despair which met Einstein at that time since three quarters of a century has elapsed; this would be even truer if it weren't for the fact that the nineteenth-century view of the universe has permeated much of our common-sense view of "reality" so thoroughly that most of us affirm the being of the world in a pre-Einsteinian way. Nevertheless, the dogmas that most of us hold about the universe are not as solidified as those of scientists at the end of the last century. We are more prepared to
accept the Einsteinian view because we know that Einstein revolutionized science even if we do not know exactly how. As a matter of fact, the public made and continues to make Einstein into a focus for its desire to worship genius. As Merleau-Ponty explains the phenomenon, the public

prefer[s] to evoke who knows what animal power which allegedly engenders the theory of relativity in Einstein as it produces respiration in us. Einstein may protest all he wants; he must be made differently than we are, have a different body and perceptions, and among these, by good luck, relativity. 12

This was a circumstance which constantly bewildered the physicist. He could never understand why people who hadn't the slightest indication of what he had done could venerate him so highly.

Nevertheless, while we may be somewhat surprised when we discover in what ways Einstein's theories affect our notions of space and time, we, at least, are prepared for the possibility. In 1905, however, Einstein was not a world phenomenon. He was quietly working in a patent office in Berne, Switzerland. Physics, on the other hand, was represented as a rather compact, nicely organized, and closed discipline. Towards the end of the century, for example, the "chairman of the physics department at Harvard discouraged graduate study because so few important matters remained unsolved." 13 Lewis Thomas, the author of some recent expositions of the biological sciences, illustrates the situation by pointing out that "sometime around the close of the 19th century, Lord Kelvin, an eminence in the physics of that day, assured for himself a sort of immortality in his field by announcing that physics was now a finished science, that all the
essential information in his field had been acquired, and that now, all that remained was to tidy up a few loose ends here and there.\textsuperscript{14}

There was good reason for this view. Newtonian physics had been extremely successful in explaining the universe and in allowing man control over nature. It worked. Since Descartes' distinction between \textit{res cogitans} and \textit{res extensa} the world of objects had been given in opposition to the mind of man. But the universe could not be perceived as a chaos of objects. Some order must exist in its parts if there was to be a connection between God, the soul, and the material bodies in the world. Descartes found this order in the geometry of Euclid, where each theorem follows by logical necessity from those which precede it. Thus the universe was run by a series of determinate and determinable causes and effects. Space, represented by the Cartesian coordinates, was absolute and motionless, and time was the sequence of juxtaposed slices of space, each of which implied (due to the indubitable causal linkages) the others. Inside this container were isolable objects which could be shown to function according to the determinate forces which acted upon them. Thus space and time were absolute and separate, as were energy and matter. All operated independently of perceptive apprehension in an objective world according to rigid cause-effect logic. It was Newton, and his followers, who formalized this logic, who discovered the axiomatic principles which must account for this Euclidian-like arrangement. And the formulae worked. There were indeed a few minor confusions; for example, it wasn't clear how two bodies could establish a force between them, but, in general, there was a faith that all of the
mysteries of the universe could be explained by discovering smaller and smaller units which formed wholes in a mechanistic fashion. The only problem with this view was that by 1900 evidence began to accumulate which suggested it was simply wrong.

One of the "loose ends" that Kelvin felt needed tidying up was the difficulty which the Michelson-Morley experiment provided. At the turn of the century there were two great problems that physicists faced, and they were not unrelated. The first was to discover some frame of reference which was absolutely at rest. Such an "inertial co-ordinate system" would be a system in which all of the Newtonian principles of mechanics would be absolutely valid and from which transformations to moving systems could be made. It had, of course, been clear for some time that the earth could not provide such a co-ordinate system, since it is in motion around the sun, and if the entire solar system is in motion with respect to the rest of the universe then it was, of course, difficult to determine what was at rest and what was really moving. Galileo had already toyed with the problem of relative motion, and it had been obvious long before Einstein that when one is in a closed and moving system, things outside the system will appear to be moving, even if they are at rest. The problem was perplexing and was for a long time solved by positing the absolute fixity of space through which bodies moved. Space provided the "inertial co-ordinate system" along the lines of Descartes. It is important to realize how much of the metaphysical implications of classical physics are tied to this point.
A difficulty developed with this view, however, and it rests with the second major problem confronting physics in 1900: the nature of light. Simply put, the notion of space as absolutely at rest was a notion of absolute non-being. From the physicist's viewpoint there was not much wrong with this idea as long as one held with Newton's theory of the corpuscular nature of light. But by the middle of the 19th century a good deal of evidence had accumulated suggesting that light is a wave. Although the theory had been voiced earlier by Huygens, Newton's view had been more persuasive, until experiments illustrating that light is susceptible to interference patterns characteristic of waves became commonplace. Increasingly it began to look as if light were a wave and not a series of particles. Now, if it was accepted that light is wave-like, it immediately became difficult to explain how it could be propagated through a void since any wave needs a medium to carry along its undulations. The perplexity was tentatively resolved only by positing the existence of a rather mysterious "entity" called ether, a sort of substanceless substance. No one seemed to understand the idea very well, but it appeared the only way out of the dilemma. If, in fact, the ether existed, it would not only explain how light could move, but it would also provide the absolute fixity needed for the inertial frame of reference. The idea was that every object moves through a vaporless vapor, the ether, which was itself not susceptible to motion.

The Michelson-Morley experiment was designed to detect the presence of this ether. The idea was simple. If the earth moved through
the ether, then there must be a sort of ether breeze caused by the wake of the earth's movement. If this were true, then light must move more slowly when directed against the pressure caused by this wake than it would if it moved perpendicular to the direction of the earth's movement. Michelson and Morley designed an apparatus to measure the speed of light in various directions. Unfortunately, they were unable to detect any difference in the velocity of light regardless of its direction of propagation. This seemed the end of the idea of the ether. It could be saved only by accepting the theory put forward by Fitzgerald and Lorentz that the ether not only caused the speed of light to decrease but that it also put pressure on the measuring instrument used to determine the distance travelled by the light moving into the ether. If this were true, the light would move more slowly but have a shorter distance to travel, thus appearing to travel at the same speed as light moving in other directions.

What Einstein said in the Special Theory of Relativity, borrowing from Fitzgerald and Lorentz's theory of contraction, is at once simple and extraordinary. First, he disallowed that there is any frame of reference which is privileged with respect to any other. As he put it, "the view . . . to be developed will not require an 'absolutely stationary space' provided with special properties."15 This meant that the "introduction of a 'luminiferous ether' will prove superfluous."16 Second, he accepted as fact that "light is always propagated in empty space with a definite velocity c which is independent of the state of motion of the emitting body";17 that is,
he accepted as fact that light moves at the same speed for any observer, regardless of his motion. This, in itself, defies ordinary logic since if two objects, A and B, are moving toward one another with, relative to some absolute frame of reference, velocities $V_1$ and $V_2$ respectively, one would assume that the relative velocity of the movement of A to B (or B to A) would be $V_1 + V_2$. Einstein is saying that this principle of transformation is not applicable to the speed of light. Taking these two postulates together implies that as one approaches the speed of light distances (or space) shrink and time measures longer. That is, this seems to be the case with respect to some observer who is moving at a much slower rate. In other words, time, space, and motion (or frame of reference) are intimately linked together. There is no absolute time or absolute space.

The idea is actually not very complicated, although because it defies ordinary sense it seems mind-boggling. If one assumes that (1) there are two frames of reference, A and B, and that (2) A is moving toward a light source with respect to B and that (3) both observers will arrive at the same numerical interpretation of the speed of light, it must follow that the measuring rod used by A is shorter with respect to B (even though they are the same length at rest) and that the time interval available to A in which to use the measuring rod is longer with respect to B. Hence, observers in both A and B will arrive at identical calculations, but the space of A will appear contracted from the perspective of B and the time will appear longer. Of course, since A and B are actually moving with respect to one another, the space of B will also appear contracted
from the perspective of A and B's time will appear longer. There is no use in trying to decide which perspective is correct, for they both are. They are different relative to one another but identical in each "proper" frame of reference. As Bronowski reduces it in 1967, "physics does not record events but observations."

And event, signal, and observation are linked in a way which cannot be taken apart. We cannot abstract the event, we can only study the relation between observations. Relativity is the understanding of the world not as events but as relations.18

In other words, that which was once thought to be static and independent of observation must now be seen as intimately connected with observation.

However, this is not to say that that which is is entirely subjective. This is to emphasize but one half of Einstein's theory. Einstein's view is that if the universe is a watch with gears pre-set in motion, we are inside the mechanism and can't get out of it to see how it works. We can, however, determine what the relations are from inside, and when we do, we discover that they are invariant. This is difficult to explain and is best exemplified by one of Einstein's famous thought experiments: Assume that there is a frame of reference, A, which consists of an enclosed glass box with a light source in the middle, and assume, also, that A is moving relative to a stationary observer B. This means that someone in A will perceive the light striking both the front and the rear of the box at the same time (the front being that portion of the box which heads in the direction of its movement). However, from the perspective of B
the light must strike the rear of the box before it strikes the front since the front of the box is rushing away from the light in transit while the rear of the box is rushing toward the light. Thus, what seem to be two simultaneous events in A will not be simultaneous to B. Now, since to coordinate two times necessitates sending a signal through space and since that signal can never move faster than the speed of light, it is impossible to designate any one "now" which exists throughout the universe. Time is not absolute, as Newton posited. Nor is space. Neither can be perceived as a series of isolated points. Nevertheless, since the apparent time is dependent on the speed of the perceiver (i.e., movement through space), this implies that there is a connection between space and time. This connection, it turns out, is invariant; it can be represented in mathematical formulae which are somewhat similar to the Pythagorean theorem, except that here there are four dimensions rather than just two. What is more important, however, is that this connection between time and space is intimate. The space-time continuum suggests that one can no longer think of time and space as separate measures. This too goes against Newton.

The potential philosophical implications of this are debatable. This is largely true because it is impossible to conceptualize a space-time continuum; it is impossible to represent a four dimensional space-time. This means that there is a tendency to interpret the idea either as the spatialization of time (a tendency which is very old) or as the temporalization of space. These tendencies are
understandable given that when either term is allowed to assume a hierarchical status a logical conceptualization is possible. (These tendencies are exemplified in the debates as to whether the continuum should be labeled "space-time" or "time-space.") Thus, Gary Zukav, in a popular account of modern physics, suggests that relativity implies a static universe.

The special theory of relativity . . . says that it is preferable . . . to think in terms of a static, non-moving picture of space and time. This is the space-time continuum. In this static picture, the space-time continuum, events do not develop, they just are. If we could view our reality in a four-dimensional way, we would see that everything that now seems to unfold before us with the passing of time, already exists in toto, painted, as it were, on the fabric of space-time.19

On the other hand, Milic Capek suggests that relativity implies the "reinstatement of becoming in the physical world."

But is time really spatialized in the relativity theory? It is not. The alleged spatialization of time occurs merely in the imagination of some interpreters who in retaining the classical habits of thought follow the path of the least psychological resistance.20

The differences in interpretations reflect the age-old difficulty in collating Being and Becoming, for indeed in the Eleatic tradition the wholeness of Being is represented in spatial terms while in the Heraclitian view Becoming is associated with psychical temporality.

In this connection it is well to keep Capek's advice in mind: "if space is inseparable from time, it is certainly artificial and misleading to deal with its properties as if it were an independent entity."21 If the fusion is to be taken seriously, it seems more
appropriate to accept Joseph Kockelmann's interpretation that "the fundamental intention of the theory of relativity [is] to emphasize most strongly that physical entities are not static but dynamic realities."\textsuperscript{22} The theory suggests that "the being of worldly beings is a coming-to-be," "that natural 'being' and 'becoming' are identical."\textsuperscript{23} It recalls, Kockelmann realizes, the "venerable old, but often forgotten, view" of \textit{physis} which "implied the identity of being and coming-to-be for things of nature."\textsuperscript{24} Although Kockelmanns disagrees with Heidegger's view that "the Greeks did not learn what \textit{physis} is through natural phenomena,"\textsuperscript{25} he does see the connection with Heidegger's exposition of the term: it means the "power of emerging and enduring [which] includes 'becoming' as well as 'being' in the restricted sense of inert duration."\textsuperscript{26} Köckelmans sees that the theory of relativity and Heideggerean \textit{physis} imply that "being and coming-to-be [are] identical or at least necessarily imply each other."\textsuperscript{27}

Herman Weyl, a brilliant mathematician and colleague of Einstein, apparently struggles to express a similar idea. "The new way in which the theory of relativity solves the problem concerning the connection of space and time in reality," he writes in 1918, "coincides with a new insight into the causal connection of the world."\textsuperscript{28} By "causal connection" Weyl means the way in which "the world is working" and the way in which the "will through [the]body and as moving act grasps across into the real world."\textsuperscript{29} Weyl hypothesizes that "just as time is the form of the stream of consciousness, so can one rightly argue that space is the form of material reality."\textsuperscript{30} How-
ever, the "worlds of consciousness and transcendent reality" are not "completely separated from one another," nor is "the silent glance of perception . . . the sole bridge between them." In fact, the two merge to form one whole. On the one hand, "in the experience of action and passion I become for myself a single individual of psychic reality which is connected with a body which among the material things of the outer world has its place in space." "On the other hand, consciousness . . . also extends its form, time, to reality: that is why, in itself, there is change, motion, progress, becoming, and passing away." It is obvious that Weyl is arguing from a phenomenological perspective, in which there is a wedding of object and subject; it is enlightening that he, one of the original co-founders of relativity, sees the theory as an analogue to this view.

In any case, if the notion that the space-time continuum suggests the union of Being and Becoming is somewhat problematic, it is at least clear that the Kantian a priori categories of space and time are quite modified by relativity theory (as are causality and substance by quantum mechanics). This is, obviously, of extreme importance to physics since the Kantian model was thought to provide the very ground for the condition of science. According to Heisenberg, for instance, "the theory of relativity has changed our views on space and time; it has in fact revealed entirely new features of space and time, of which nothing is seen in Kant's a priori forms of pure intuition." This is not to suggest that Heisenberg wishes to annihilate the concept of a priori synthetic judgments which make empirical
experience possible. (They become for Heisenberg "relative truths.") However, if Kant did not infuse axiomatic rationalism (and Euclidian geometry) into nature itself, they do become the condition for experience, and much of nineteenth-century science did infuse these into things-in-themselves. Einstein's theory begins not with this sort of axiomatic reasoning but with observation. While the theory of the ether was a totally axiomatic construct without any connection to experience, the theory of relativity is not. As a consequence, a new and better way of interpreting the "facts" was developed as many of the previous, and preconceived, ideas were demolished. Besides the relationship between frame of reference and "determinate" spatial and temporal data, which has profound implications for any objectivist's view of the universe, the special theory of relativity held out the possibility of scientific discovery which did not reflect the Kantian categories. This, along with another of Einstein's first three papers, was to have a profound effect on the development of quantum mechanics, a branch of physics even more startling than relativity.

In fact, the paper for which Einstein received the Nobel Prize was not the paper dealing with relativity. It was the paper dealing with the photoelectric effect of light, a fact which illustrates the significance which the study of light has had on the development of modern physics. This is not simply a bit of historical triva; the existence of light is what makes spatial observation available; without light the very observational data necessary to study physical phenomena would not exist, and thus an understanding of the nature of
light has vast implications for the way in which the phenomena of the world can appear at all. Indeed, the exact nature of light continues to be, even today, one of the thorniest problems which modern physics faces.

Einstein pointed to the fact that when a beam of light is directed on a light-sensitive metal plate, the plate will give off energy by emitting electrons. Changing the intensity of the light in no way affects the velocity of each emitted electron. However, there is a direct ratio between the light intensity and the number of emitted electrons: the brighter the light, the greater the number of electrons. Conversely, different frequencies, or colors, of light cause different velocities in the emitted electrons. That is, there is a direct ratio between intensity of a given light frequency and the number of electrons emitted within a given period of time, and there is also a direct ratio between the frequency of a given color of light and the velocity of the emitted electrons (i.e. energy). Einstein explained this phenomenon by suggesting that light consists of particles, called photons, which bombard the metal plate in much the same way that the bullets from a gun would, assuming that each bullet would dislodge one electron. The more rapidly the gun fires (i.e. the higher the light intensity), the greater the number of electrons dislodged during a given time; however, the electrons would disperse with a velocity dependent upon the speed of the bullets. The faster each bullet moves (i.e. the higher the frequency of the light) the more energy each emitted electron will have. Hence, light consists
of discrete particles moving linearly in sequence. The only problem with this is that light had already been shown to be wave-like. Einstein knew this well; he left it to others to decipher the paradox.

Einstein's explanation of the photoelectric effect of light, however, went a long way toward substantiating Max Planck's assertion that energy comes in discontinuous packets rather than in a continuous flow. George Gamow, an associate of Niels Bohr, explains Planck's law succinctly, if somewhat dramatically:

During the last week of the last year of the last century, a German physicist, Max Planck, stepped to the blackboard at the Christmas meeting of the German Physical Society, and made an extraordinary proposal. The idea was that light and all other kinds of electromagnetic radiation, which were always considered as continuous trains of waves, actually consist of individual energy packages with well-defined amounts of energy per package.36

Clearly, Einstein's explanation is parallel to Planck's thesis; light and energy consist of discrete particles, called "quanta" by Planck. There was already evidence for such a view in Rutherford's experimentation with radiation; Planck's hypothesis also helped to explain current problems with "black body radiation," and, of course, numerous experiments could be designed to expose the photoelectric effect. When the evidence for light being quanta is coupled with the evidence for light being wave-like, and when this in turn is formalized in the second portion of Planck's quantum law, "it leads," as Max Born has said, "right amidst philosophy."37

The problem is obvious. Is light particle or wave? As Born puts it,
the difficulty arises if we consider the funda-
damental discrepancy in describing one and the
same process sometimes as a rain of particles,
and at other times as a wave. One is bound to
ask, what is it really?38

The answer he gives, as does orthodox quantum mechanics, is that the
nature of light "depends on the method of observation."39

We thus meet a situation similar to that in
relativity, but much more complicated. For here
the two representations of the same phenomenon
are not only different but contradictory. I think
everyone feels that a wave and a particle are two
types of motion which cannot easily be reconciled.
But if we take into account the simple quantita-
tive law relating energy and frequency already
discovered by Planck, the case becomes very serious.40

In suggesting that the "case becomes very serious" Born is referring
to the second portion of Planck's law, for Planck had argued that
"the amount of energy per [quanta] package depends on its vibration
frequency \( v \), and is directly proportionate to it, so that one can
write:

\[ E = h v \]

where \( h \) is a universal constant."41 This means, according to Niels
Bohr, that an "irrational feature" has been introduced "into the
description of nature."42 It points, in Born's words, to a "logical
difficulty: a particle with a given velocity is, qua particle, a
point, existing at any instant without extension in space. A train
of waves is by definition harmonic only if it fills the whole of
space . . . ."43 Essentially, Planck's thesis says that waves create
particles, which from the standpoint of ordinary logic is a "diffi-
culty" indeed. The corollary to this thesis was expressed by Louis
de Broglie: all particles have associated waves; the view was mathematically formulated by Erwin Schrödinger in 1926, and the two views, Planck's and Schrödinger's, were collated a year later and lead to the Copenhagen Interpretation of Quantum Theory.

It is important to realize that these views are not simply esoteric bits of scientific information. Ever since Democritus there had been a general feeling that the stuff of reality could be discovered by dividing the world into smaller and smaller parts. The technological achievements of the twentieth century allowed that division to occur on a level never before possible. Moreover, in some sense the macro world is dependent upon—is made up from—microphysical events. Thus, while the discoveries in the micro world may not be observable at the macro level, they have profound implications for the materialist and objectivist views of the universe; and they suggest important insights into man's relation to the physical world.

The Copenhagen Interpretation of Quantum Theory, still the orthodox view, presents three basic hypotheses which, to a large degree, are interrelated. The first is Bohr's Principle of Complementarity, the major aspects of which have already been sketched. Light consists of wave-like and particle-like features, but these are mutually exclusive, or "complementary," concepts. Nevertheless, they are both necessary in order to understand the behavior of light. Born explains it well:

Just as all colors which we see can be arranged in pairs of complementary colors giving white when mixed, so all physical quantities can be arranged in two groups, one belonging to the particle...
aspect, the other to the wave aspect, which never lead to contradictions, but are both necessary to represent the full aspect of nature.\textsuperscript{44}

Given this situation there are two possibilities available: one is to admit perplexity and cling to a dogmatic view that there is an absolute external reality; the other is to deny the validity of the subject-object dichotomy. Quantum theory opts for the latter. To quote Born again,

the difficulty is not the two aspects, but the fact that no description of any natural phenomenon in the atomistic domain is possible without referring to the observer, not only to his velocity as in relativity, but to all his activities in performing the observation, setting up the instruments, and so on. The observation itself changes the order of events. How then can we speak of an objective world?\textsuperscript{45}

The answer is that we cannot. In Bohr's words, "... an independent reality in the ordinary physical sense can be ascribed neither to the phenomenon nor to the agencies of observation."\textsuperscript{46} In more vernacular terms, Zukav suggests that the properties of light consist of our "interaction" with light, "that the distinction between the 'in here' and the 'out there' is an illusion."\textsuperscript{47}

The second major contribution to the Copenhagen Interpretation is Werner Heisenberg's Uncertainty Principle, a principle which parallels the rule of complementarity. Heisenberg's thesis arises from a consideration of De Broglie's hypothesis that electrons, in one sense particles inside the atom, operate as wavelike phenomena. The question which Heisenberg asked was whether or not it is possible to resolve the apparent wave-particle paradox by using classical
logic and ordinary observation. The answer that he arrived at was a definite "No." Heisenberg, like Einstein, resorted to a thought experiment to explore the problem. He hypothesized a chamber in which there is one electron and then asked whether it is, in principle, possible to determine both the electron's velocity and momentum. In order to observe either, it is necessary to introduce light, but he allowed for the possibility of utilizing light of infinitely large and small frequencies. Now in order to see any object in its exact location it is necessary that the light not be able to bend around the object. That is, the space to be illuminated cannot be smaller than the illuminating light frequency. Hence, in order to detail the position of the electron it is necessary to use light of a high frequency. However, the higher the frequency, the greater is the light energy which each photon of light will contain. As each photon strikes the electron to be observed, the electron will rebound from the collision. Obviously, the speed of resultant movement of the electron will depend upon the energy of the striking light. Therefore, using light of lower and lower frequencies allows one to more and more accurately pinpoint the electron's velocity, but this, in turn, increasingly disallows the accurate observation of the electron's position or path. On the other hand, using light of higher frequencies allows the position to be more detailed but disallows the accurate observation of the electron's velocity. As it turns out, the degree of uncertainty can never be smaller than Planck's constant divided by the mass of the particle under observation, which in essence means that
"the band of uncertainty is about as wide as the distance of the orbit
[of the electron] from the nucleus [of the atom]."\textsuperscript{48}

This implies that quantum mechanics is not an "exact" science, at
least in the classical sense. Rather than assuming that there is a
determinate state of affairs which can be known, quantum theory assumes
only that there is a probable state of affairs. This point is crucial,
but it is too easily overlooked, or not understood, because it forces
a new, and perhaps somewhat uncomfortable, way of looking at things.
It was exactly on this point that Einstein, holding that "God does not
throw dice,"\textsuperscript{49} rejected quantum theory. Just as with complementarity,
the Uncertainty Principle has profound implications for the notion of
an objective detached reality. Accepting that "small material parti-
cles . . . move over a range under the guidance of waves," Gamow sug-
gests, "the important point is that the guidance is performed in a
stochastic rather than a strictly determinate way."\textsuperscript{50} As Bohr puts
it, this fact suggests " . . . the necessity of a final renunciation
of the classical ideal of causality and a radical revision of our
attitude toward the problem of physical reality."\textsuperscript{51}

The conclusion to be drawn from the Uncertainty Principle is so
important and so fragile that it must be stated carefully. As Heisen-
berg realizes, the "partition" between subject and object "has pene-
trated deeply into the human mind during the three centuries follow-
ing Descartes and it will take a long time for it to be replaced by a
really different attitude toward the problem of reality."\textsuperscript{52} Yet, if
quantum mechanics is to be accepted, such a change in attitude is
necessary. C. F. von Weizsacker, a thermonuclear physicist and student of philosophy, points out that in classical physics without changing the conceptual structure of science we could talk about its objects, of which we have knowledge, without explicitly taking account of the fact that we know them; and what was discussed was only what meaning there was in the consequence drawn from this by naive science, that objects "really" exist independently of our knowledge. Quantum mechanics, on the other hand, denies even the premise of this discussion.\(^5\)

"This means, ontologically," he goes on to say, "that the concept of object can no longer be employed without consideration of the subject having the knowledge."\(^5\) It is for this reason that Merleau-Ponty sees quantum theory as a potentially powerful support for the phenomenological view: "the considerations regarding scale, for example, if they are really taken seriously, should not relegate all the truths of physics to the side of the 'subjective'--a move that would maintain the rights of the idea of an inaccessible 'objectivity'--but they should contest the very principle of this cleavage and make the contact between the observer and the observed enter the definition of the 'real.'\(^5\) And clearly Heisenberg's explanation of the philosophical impact of the Uncertainty Principle has a phenomenological ring: "The world," he writes, "thus appears as a complicated tissue of events, in which connections of different kinds alternate or overlap or combine and thereby determine the texture of the whole.\(^5\)

It must be remarked that there is sometimes a tendency to assume an objective state of affairs and that the measuring device simply disturbs this state. This, however, is not the correct view; that this view sometimes appears is the result of a natural tendency to
slip back into a realist's position, and this tendency is encouraged by the difficulty inherent in attempting to explain the relationship between the observer and the observed. That is, in collapsing the distinction between subject and object, it is almost impossible not to speak of the two as if they were separable. This creates problems in conceptualization. Von Weizsacker is helpful in explaining the situation:

The indeterminacy of measurable quantities has sometimes been correlated with the disturbance of the object by the act of observation. This way of putting it is misleading. For it creates the impression that the object has, before it has been observed, certain properties which are destroyed only by the act of observation. So interpreted however this would mean a retrogression into a way of thinking that preceded quantum mechanics.\(^{57}\)

The fact is that in order to assume an objective state of affairs at all one must first be in a position to delineate its essential features. If the delineation of these features must change depending upon the relation of the observer, one is no longer in a position to ascribe an objective state to those affairs; the observer and the observed are intimately connected. To quote von Weizsacker again:

a presupposition for the possibility of ascribing a given property to an object is an arrangement for making measurements which allows us to ascertain this property. If now, through the application of a new measuring device, I switch to the measurement of the quantity complementary to the one previously measured, then the conditions no longer exist under which the previously measured quantity could have any determinate value at all.\(^{58}\)

It is for this reason that Heisenberg, alluding to Bohr, emphasizes that "quantum theory reminds us . . . of the old wisdom that when
searching for harmony in life one must never forget that in the drama of existence we are ourselves both players and spectators.”

Heisenberg, and other physicists, gave up the idea of an independent objective reality reluctantly. The question was what was to replace this idea. Heisenberg's solution to this problem was that reality is not a static substance but a dynamic potentia, "a strange kind of physical reality just in the middle between possibility and reality." There is in nature a possible series of discoverable events which come to actuality only by the putting of questions. Thus the object which quantum theory studies is the interrelation of man and nature. As Patrick A. Heelan explains it, Heisenberg's term "potentia" is used to describe a "new kind of noumenal reality in which subject and object cannot be separated from one another.”

The actualization of an event by observation ... results from a more or less confused union of subject and object. The objective tendency or potentia then is the noumenal correlate of this union of subject and object in experience. It is then on the one hand not simply the thing-in-itself in the external world, nor on the other hand is it simply the transcendental ego; it bridges both the external world and the transcendent subjectivity of the knower.

As Heelan translates it, in Heisenberg's contribution to the Martin Heidegger Festschrift he indicated that "the search for the natural laws of the [ultimate structure of matter] entails the use of general principles of which it is not clear whether they apply to the empirical behaviour of the world or to a priori forms of our thought, or to the way in which we speak.”

This concern with "the way in which we speak" points to Bohr's
Principle of Correspondence, the third major aspect of the Copenhagen Interpretation. The correspondence rule asserts that the experiments of quantum mechanics must be expressable within the language of classical physics even though what they show is that the assumptions of classical physics are not completely valid. As Heisenberg puts it,

any kind of understanding, scientific or not, depends on our language, on the communication of ideas. Every description of phenomena, of experiments and their results, rests upon language as the only means of communication. The words of this language represent the concepts of daily life, which in the scientific language of physics may be refined to the concepts of classical physics. These concepts are the only tools for an unambiguous communication about events, about the setting up of experiments and about their results. 54

To put it another way, the utilization of the classical concepts is a precondition for the establishment of quantum theory and experimentation. Quantum theory suggests an experiential level which is of a different kind from that of classical theory, and yet this experiential level requires the classical conceptualizations and their attendant symbolic formulations. By the same token, however, the classical formulations are to be thought of as limited cases of quantum theory. That is, classical physics, its notions of substance, causality, space, and time, is to be thought of as a subset of the more encompassing quantum theory. In short, the conceptualizations of classical physics are necessary for the generation of quantum theories, but it is quantum theory which explains the apparent consistency of classical physics.

This, of course, implies a circular relationship. There is
no way to design and describe experimentation without recourse to classical logic and understanding. Hence, as von Weizsacker notes, classical physics is the "procedural a priori" of quantum mechanics. On the other hand, "quantum theory is a more fundamental branch of natural knowledge than classical physics, and it is only quantum mechanics which explains, for example, the possibility of the existence of solid bodies, which are, of course, necessary in classical physics . . . ."65 This suggests a similarity to the phenomenological equation of the mutual dependence of the ontic and ontological realms, and, in fact, this is exactly the implication which Wilhelm Szilasi, who assumed Heidegger's vacant chair at the University of Freiburg, draws from the correspondence principle.

What the correspondence principle asserts is not unfamiliar to philosophy. It also realizes ontological experience only in conjunction with ontic experience. For it as well, every single moment of experience is charged with the bond between a thing experience and the experience of Being, which is of course not explicit.66

While the "ontological experiences of the moment of articulation refer to reality" and the "ontic experience refer to the moment of appearance whose reality is to be interpreted," both substance and process, in fact, are "intertwined" together.67

It is language which provides both. Bohr is reported to have once remarked that "ultimately, we human beings depend on our words. We are hanging in language."68 A colleague of Bohr's disagreed, arguing that reality "lies beneath" language, and Bohr responded: "We are suspended in language in such a way that we cannot say what
is up and what is down." Jeffrey Bub, a physicist, finds a parallel to this remark, and the principle of correspondence, in "certain aspects of Wittgenstein's thought, particularly as expressed in the *Tractatus*:

Propositions can represent the whole of reality, but they cannot represent what they must have in common with reality in order to be able to represent it--logical form. In order to be able to represent logical form, we should have to be able to station ourselves with propositions somewhere outside logic, that is to say outside the world. 4.12

The language in which the physicist is "hanging" is the language of classical physics, and this language determines the world and the physicist's approach to it. And yet, it is through this language that a change in logical form can be generated. "The 'quantum jump' from classical to quantum mechanics," as Bub asserts, "involves a change in the logical form displayed in the propositions of mechanics. Since propositions cannot represent logical form, the only way in which a change in logical form can be mirrored in language is 'from the inside.'" If there is one thing which relativity and quantum mechanics should teach it is that it is not possible to get outside the world and man's interconnection with it in order to found some absolute truth. This is partly due to and partly reflected in the limitations imposed by symbolic formulations which allow an encounter and interrelationship with the world in the first place. Nevertheless, it is possible to suggest the relationships in the world in the only language available. Heisenberg, for example, notes that "the ordinary language was based upon the old concepts of space and time
and this language offered the only unambiguous means of communication about the setting up and the results of the measurement."71 This language is necessary, but from it arises a different usage of language, "a language that produces pictures in our mind, but together with them the notion that the pictures have only a vague connection with reality, that they represent only a tendency toward reality."72 As Bub puts it, "the change in logical form shows itself in the language of (classical) physics through the logic of 'indivisible, closed phenomena,' in which the experimental conditions and results are described classically."73

Heisenberg's writings suggest a distinction between what he calls "closed theories" and the "intrinsic uncertainty of the meaning of words"74 which helps to explain this opposition. He recognizes that "the structure of our thinking is determined in our youth by ideas which we meet at that time or by getting into contact with strong personalities . . . ."75 It is also determined by a "community" which is "kept together by common ideas, by a common scale of ethical values, or by a common language in which we speak about the general problems of life."76 This leads to certain "idealizations of reality" or "closed theories," Newtonian physics being one.77 Such closed theories come about because we "approach reality with certain concepts,"78 forming an "indispensable part of the language in which we speak of nature."79

This development appears . . . as a succession of intellectual constructs, "closed theories," which take shape, as if from a crystal nucleus, out of individual queries raised about experience, and which eventually, once the complete crystal has
developed, again detach themselves from experience as purely intellectual structures that nonetheless forever illuminate the world for us.80

Closed theories are "among the presuppositions of the wider inquiry; we can express the result of an experiment only in the concepts of earlier closed theories."81 Thus, the closed theory provides both possibilities and limitations. Any "closed-off theory contains no perfectly certain statement about the world of experiences," for closed theories "can be regarded as idealizations [only] for restricted fields of experience."82

When we represent a group of connections by a closed and coherent set of concepts, axioms, definitions and laws which in turn is represented by a mathematical scheme we have in fact isolated and idealized this group of connections with the purpose of clarification. But even if complete clarity has been achieved in this way, it is not known how accurately the set of concepts describes reality.83

And yet Heisenberg realizes that "the human ability to understand may be in a certain sense unlimited."84

Why? Because the generative power of language is infinite. If the "general trend of human thinking in the nineteenth century has been toward an increasing confidence in the scientific method and precise rational terms [which] led to a general skepticism with regard to those concepts of natural language which do not fit into the closed frame of scientific thought . . .,"85 quantum mechanics, Heisenberg feels, has taught us that any "understanding must be based finally upon the natural language because it is only there that we can be certain to touch reality . . . ."86 But it must
be remembered that this reality cannot be fixed, and this parallels the fact that the meaning of words cannot be fixed. Heisenberg goes on to say that

any concepts or words which have been formed in the past through the interplay between the world and ourselves are not really sharply defined with respect to their meaning; that is to say, we do not know exactly how far they will help us in finding our way in the world. We often know that they can be applied to a wide range of inner or outer experience, but we practically never know precisely the limits of their applicability. This is true even of the simplest and most general concepts like "existence" and "space" and "time." Therefore, it will never be possible by pure reason to arrive at some absolute truth.87

As von Weizsacker puts it, "every word transcends the phenomena."88

We use language in order to be able to philosophize at all. On the other hand we know or suspect about each word that it does not exactly designate a given. We have no means of avoiding this situation once and for all, but can only, from time to time, criticize particular words by the use of other words which are themselves uncriticized.89

It always takes a special effort to examine the question whether a word or a sentence reproduces the phenomena; and the result of this investigation can always be expressed only in sentences, which use other words without investigating them.90

According to Heisenberg, science must search for the "boundaries that determine where the word is to be used and where not," but this search allows for only a temporal fixity because "definitions can be given only with the help of other concepts, and so one will finally have to rely on some concepts that are taken as they are, unanalyzed and undefined."91 The fixity is only temporary because it is always the value of language that "every word may cause
only half-conscious movements of our mind . . . "  

That these concerns of Heisenberg and von Weizsacker parallel the concerns with language explored by contemporary critical theory should be obvious. From the standpoint of modern science there is nothing novel about the post-structuralist denial of the possibility of discovering absolute truth. It would appear that modern physics has, like Derrida, discovered that the difficulties of encapsulating presence are intimately tied to the problematics of language, where the meaning of each word is dependent on the meaning of others which, in turn, are defined within a circular system. Moreover, if man is "hanging in language," if he is forced to encounter the world through "closed systems" which can only elucidate some aspects of the world, it is clear that the legitimacy of any delineation of physical phenomena is relevant only within the context of each system. The notion of "closed systems," particularly with all of the linguistic ramifications that Heisenberg attributes to them, are clearly analogous to the Saussurean emphasis upon cultural langue. It is not possible to design an experiment or formulate its results, to articulate a meaning (parole), without reference to a system of expectations (langue) which limits the results.  

Yet there is something more being asserted here. If systems of symbolic formulation inject limitations, they also allow for possibilities. "Every word transcends the phenomena." Historically, there is no discipline which demanded rationalistic interpretation more than did science, but it was through the rigorous application of this de-
mand that its limitations were discovered. It is no longer possible to separate sense data into primary and secondary qualities. There is no such thing as a "clear, distinct" idea. Now, it is physics which denies the subject-object split perhaps more than any other discipline, and in so doing it has allowed a humanistic indeterminism back into the world. This is connected with the "intrinsic uncertainty of the meaning of words" which points to a power of language that goes beyond the more highly pronounced fixities of langue. It is this element which allows for interpretation and re-interpretation, in short, for creativity.

The more recent hypotheses of contemporary physics hardly deny this element. If anything, they emphasize it more strongly. Earlier in this section it was asserted that these theories may vindicate Einstein's intuition that there is a universal whole; this is so because these so-called "hidden variable" theories challenge the emphasis upon chance which is important to orthodox quantum mechanics. Based upon striking experiments which demonstrate that each of two particles separated in space seems to react, without time lapse, according to the stimulus addressed to its partner, there is increasing evidence that the elements of the universe comprise a nexical whole. It is what David Bohm, perhaps the leading physicist who advocates this view, calls the "implicate order." However, Bohm's view is not based on the rejection of the inseparability of observer and observed, which is crucial to quantum theory and relativity, but rather on accentuating this idea.
... the "quantum" context calls for a new kind of description, which does not make use of the potential or actual separability of "observed object" and "observing apparatus." Instead, the form of the experimental conditions and the content of the experimental results have now to be one whole, in which analysis into disjoint elements is not relevant.93

Perhaps John P. Wiley, in the February, 1981, issue of the Smithsonian, summarizes Bohm's theory the most neatly:

Instead of starting with the fragments of our "real" world that we can actually see, ... Bohm's ideas begin with the whole universe as a constant flowing, a flux. In this river, the currents from time to time produce little vortices, little whirlpools that we can see. These are the fragments of the sensible world that we do see, trees and galaxies. He sees the universe as full, as a sea of energy in which the ripples on top are the pieces of our world ... .94

But Bohm also realizes, despite his emphasis on the wholeness of the universe, that "there is no point to the effort to get closer to ultimate truth . . . ."95 This, however, does not mean that change and creativity are denied. For Bohm, perception and communication also form a whole.

... I want to emphasize that scientific research does not consist of first looking at something and then communicating it. Rather, the very act of perception is shaped and formed by the intention to communicate, as well as by a general awareness of what has been communicated in the past, by oneself and by others. Even more, it is generally only in communication that we deeply understand, that is, perceive the whole meaning of, what has been observed. So there is no point to considering any kind of separation of perception and communication.96

This means that "all the terms [of] a theory can have their meanings and their criteria of factuality and truth only in the context given by that theory."97 This is, once again, the idea
of a closed system, except that Bohm has radicalized Heisenberg's view and extended it to individual theories. (The New Critic might read "texts.") This, however, is not the entire story, for if it were it would imply a severe solipsism and deny the very possibility of communication. Bohm is not as clear as one might like at this juncture, but it appears as if communication for Bohm is a dynamic activity; it is not the assigning of a fixed system of signifiers to a pre-given sequence of data or preformulated ideas. Whenever one acts in the world, or in science, one has the "results of previous work" in the "back of the mind," but the very possibility for change demands that they be understood in a way which defies objective interpretation.

. . . theories are changing all the time; . . . each new step may introduce something novel and "incommensurable" with what came before. Indeed, even to read an article and to understand it is, in general, to change it significantly. For understanding something is assimilation, that is, making it a whole with oneself. When this happens, what is thus assimilated takes on a form that is in certain ways unique, being different from the form of another person's understanding, or from that of one's understanding at another time.98

This inescapable demand that one re-interpret ("misinterpret" if one prefers to cling to a veiled objectivist's vision) is hardly "inessential" or "irrelevant" for Bohm. It is what gives rise for "action to be creative of harmony"99 and is a response to the "ephemeral" nature of "our overall language forms."100

This emphasis on the potential of language, which allows for imaginative creativity, is thus shared by von Weizsacker, Heisenberg,
and Bohm. It will be developed more fully in the next section; indeed, it plays an important role in each of the three "dimensions" of twentieth-century science explored in this chapter. The major goal of this section, however, was to show that in the interpretation of the natural world modern science has rejected the separation of subject and object, of observer and observed. This has lead scientists to question and sometimes refashion the detached, objectivizing philosophy which was once their proud domain and the source of numerous charges against them. Moreover, if one assumes that reading the Book of Nature is a hermeneutical act, the impossibility of separating reader and text may suggest important parallels for theories of literary interpretation.

---

A New Science: The Imaginative Dimension

The focus of the last section was directed to those aspects of modern physics which deny the possibility of separating subject from object in the interpretation of natural phenomena. It also became clear, however, that it is an error to deny an imaginative component to scientific investigation. It became clear, for example, that the creative discoveries of quantum mechanics are linked, at least in the minds of several theoretic scientists, to the rich possibilities of language. This, however, needs to be more clearly delineated. As was suggested in Chapter One, the questions of scientific truth and the relationship between correspondence and coherence need to be investigated since the problematics of truth have traditionally been
a difficulty for those theorists who would like to affirm an autonomous aesthetic realm. To explore these areas it is helpful to consider the views of those scientists who are equally at home in philosophical contemplation and in the laboratory. Although such theorists as Einstein, Bohr, and Heisenberg clearly evidenced philosophical leanings, they were, for the most part, practicing scientists. The two theorists to be treated here, Karl Popper and Jacob Bronowski, were also practicing scientists, but they are equally well known (and outside the scientific community probably more well known) for their reflections on the nature of science.

Another difference and another irony need to be mentioned before continuing. The last section dealt with the interpretation of nature. There the emphasis was on man’s interaction with natural phenomena. This lead to the discovery that this interaction is both limited by and opened by the richness of symbolic formulation; this was, however, a secondary consideration since the scientists were led to this conclusion only through their attempts at interpretation. In this section, however, the emphasis will be on a more direct consideration of the powers of symbolic manipulation. In other words, the emphasis shifts from the twentieth-century discoveries of natural science to those of mathematical science. This means a recounting of the implications inherent in the mathematical theorems of Kurt Gödel. The irony here is that the predominant approach to the philosophy of science during the first part of the twentieth century was logical positivism; this is ironic because the activities of practicing
scientists, as should be clear by now, were far removed from the tenets of positivism. It was for this reason that Bronowski, as indicated in the quotation at the beginning of this chapter, felt philosophers in 1930 were lost in the science of the nineteenth century. A minor irony is that Gödel was a member of the Vienna Circle but that his proof made the positivist project completely untenable.

It may be helpful to review briefly the tenets of positivism. They arise from a view that the world is composed of atomic facts and thus are obviously predicated on the Newtonian model. This grounding assumption is what makes the approach so unattractive to many physicists. Like many philosophies the goal of logical positivism is to unveil and state truth, but for the positivist truth is only that which can be verified in observation. Thus, one of the first tenets of the program is to purge language of those usages which do not follow from the nominalist position, i.e., a one-to-one correspondence between word and referent, based upon empirical validation. Words or symbols which do not fit this requirement are simply meaningless. Second, for a proposition to be meaningful, and thus possibly true or not true, the words, or symbols, have to be put together in such a way as not to confuse their meaning. Largely, this means that it is illogical, and hence results in meaninglessness, to formulate a proposition which forces a symbol to take on the characteristics of a set of atomic facts to which it does not belong.
Third, only statements which follow the first two tenets, i.e., which are built up from atomic facts (Wittgenstein) or protocol-sentences (Carnap) and which do not violate the type logic of set theory (Russell), can be labeled true or false. All other propositions are simply meaningless. Clearly, this concern with the relationship between truth and meaning is an old problem, going back to Plato and the Sophists. Actually, in some ways the logical positivist program, being so attuned to a philosophy of naive realism, trivializes the issues that Plato raised. Put simply, positivism merely chops off the Ideal realm, which could allow for a more sophisticated discussion of meaningful but non-truthful propositions. Questions of truth or falsity are limited only to what is empirically verifiable in properly constructed formalisms. All else is simply meaningless.

Like some contemporary approaches to philosophy, logical positivism called for an "overthrow" of metaphysics. Since metaphysics is based on speculation and the "misuse" of language, rather than the verifiability of science and the proper construction of logical syntax, it needed to be relegated to the scrap heap of linguistic games. Positivism affirmed, however, that it was possible to get at absolute truth and, at first, argued that logical consistency was available in natural language. When this failed, it was thought possible to construct a universal language, based upon the axiomatic principles of mathematics, which could encapsulate "truth." Gödel used these very axiomatic principles to disprove this possibility.

Gödel's proof is extremely involved and complicated; nothing
more than the flavor of the proof can be presented here. Nevertheless, this should suffice to illustrate the conclusions to be drawn from his theorems. A sort of intuitive sense of the problem can be gained by recalling the linguistic paradoxes which are parallel problems. They are all variations of Epimenides, the Cretan, who said that all Cretans were liars. This can be reduced to the sentence, "This sentence is false." A most perplexing problem. These are pretty much the same problems that Russell toyed with in his Principia Mathematica; at least, they are no less complicated than the ones he studied. Russell, for example, grappled with the following paradox in set theory:

1. There are sets which include themselves as members: for example, the set of all sets with more than 3 members;

2. There are sets which do not include themselves as members: for example, the set which includes all tables is not itself a table;

3. Question: what is the set of all sets which are not members of themselves. Is such a set like (1) above or like (2) above?

Whatever answer is given implies its own negation. In a way, this problem echoes Groucho Marx's joke that he would never belong to a club which would have him as a member.101

These puzzles, however, are not just brain teasers or jokes; a whole branch of mathematics has grown up around them. They have played havoc with desires to believe in logical consistency. Frege, for example, was forced to affix an appendix to his two volume work on the grounding of mathematical logic when he got wind of Russell's
paradox. "A scientist," he wrote, "can hardly encounter anything more undesirable than to have the foundation collapse just as the work is finished. I was put into this position by a letter from Bertrand Russell . . . " It was, in fact, to find a solution to this "undesirable" "collapse" that the type logic of Russell was directed. The common link in all of these troubling paradoxes is that they have a self-referring element. What Russell, and logical positivism, asserted then was that self-reference in a proposition leads to meaninglessness and hence had to be disallowed. Thus, a hierarchy of logical types, or the concept of metalanguages, was posited.

David Hilbert had already postulated that the variables, formulae, and theorems of any sentential calculus are simply "empty signs" which form strings according to certain formalized rules of transformation. There were, however, statements which could be made about the legitimacy or illegitimacy of any chain of elements in the calculus and about the relationships between chains. These "meta-mathematical" statements had to be of a different order since they purported to be meaningful statements about otherwise empty signs. In other words, the statements of meta-mathematics, put forward themselves in a system of signs, signified the sign relationships in some branch, say arithmetic, of mathematics proper. In order to avoid becoming entangled in self-reference it was necessary to use the sign system of a higher order to explain the sign system in the next lowest order. This was essentially the program of Russell. As
Bronowski puts it, "a hierarchy of types was created, starting with simple sentences about things, going on to sentences about sentences which are themselves sentences about sentences about things, and so on." Bronowski also notes that "no one could look on this infinite construction with anything but a suspicious eye" and that Gödel's proof showed "the theory of types [to be] an unhappy artifice."

The overall goal giving rise to Gödel's approach was the desire to prove that the axioms of mathematics can never lead to contradictions or, to put it from the positivist's perspective, that the axioms always will lead to theorems the truth or falsity of which can be decided. It was to this problem that Gödel addressed himself. As indicated above, the proof is complicated. Earnest Nagel explains that, "a reader" of Gödel's theorem "must master 46 preliminary definitions, together with several important preliminary theorems, before he gets to the main results." The basis of the approach, however, can be reduced effectively enough to make the thrust of Gödel's ingenuity relatively clear. In essence, Gödel devised a way to arithmetize formal logic. By using the uniqueness of prime numbers and exponential factoring he developed a method of representing any expression of formal logic by assigning it a unique number. Nagel is helpful:

The method is essentially a set of directions for making a one-to-one correspondence between specific numbers and the various elements or combinations of elements of the system. Once an expression is given, it can be uniquely numbered. But more than that, we can retranslate any Gödel number into the expression it represents by factoring it into its component prime numbers . . . . 107
Gödel's system, moreover, also allows that meta-mathematical statements be represented arithmetically. Hence, he was able to show the relationship between (1) formulae (including axioms and theorems) within the sentential calculus and (2) the statements available about formulae in the next higher language. That is, he was able, by employing the generated Gödel numbers, to show that "complicated meta-mathematical statements about a system could be translated into, or mirrored by, arithmetical statements within the system itself."  

The problems of self-reference seem taken care of since every number is unique, every symbol corresponds to a unique number, and every formula, generated within the Gödelian system by utilizing the unique numbers corresponding to the symbols of the constituent formula, also leads to a unique number.

The crux of the proof came when Gödel was able to arrive at a unique number \( N \) which represented the meta-mathematical statement \( (G) \) where \( G \) means, in venacular language, "the formula represented by the Gödel number \( N \) is not demonstrable." Now, there is no hole in Gödel's proof, and this means that \( G \) is a formulable statement within the axiomatic system of arithmetic. Thus, \( G \) must be true, but this shows that in the system there are formulae (or at least one formula) which are not derivable from the axioms. The corollary to this is that the axioms can not be shown to be free from contradictions. In short, any axiomatic system which purports to be complete must be inconsistent and any axiomatic system which is consistent can never be complete.
The ramifications of this proof are immense. They are on a par with Hume's challenge to scientific certainty; Hume points to the logical insufficiency of inductive reasoning; Gödel points up the logical insufficiency of deductive reasoning. The Theorem, moreover, is not dissimilar to facets of Derrida's argument. The crucial element in Gödel's approach is the demonstration that inevitably at some point in an axiomatic system there is a formula which is provable only by proving its non-provability. In other words, the formula must carry with it its own negation. This, in turn, reduces to saying that the axioms of the system must contradict themselves at some point or that the system is built on assertions which depend upon their own negations. One, of course, can add a new axiom to any system which will make the Gödelian formula for that system consistent with the axioms, but this merely creates a new Gödelian formula so that one is left with an infinite regress. The Derridean argument also has a logical basis and rests on the insufficiency of any closed symbolic system. Once one accepts that the actualizing principle of the sign system is one of difference, it is quite clear that the privileging of one sign (which amounts to the axiom of some system) is either tautological or not provable. If the sign system is closed, the privileged signifier is dependent upon a principle of negative self-reference since its "meaning" is dependent upon that which it is not; if the system is open, the same characteristic exists only with the addition that the exchange of negative self-references is infinite.
Gödel's theorem has lead to some interesting debates about whether the human mind can be modeled by a digital, or binary, computer. John Lucas, for example, argues that "thanks to Gödel's theorem, the mind always has the last word,"\(^{109}\) that a "model of the mind which is mechanical" is "essentially dead" while the mind, "being in fact 'alive,' can always go one better than any formal, ossified, dead, system can."\(^{110}\) The binary system can not allow for the paradox of affirming the two sides of a contradiction; it is based upon difference, keeping opposites separate. Thus, within the system there is no way to examine the basis of the system itself. Lucas's argument is that because a mind can always construct a Gödelian formula for any closed and formal system, the human mind must be different from any mechanical model.

We can see how we might almost have expected Gödel's theorem to distinguish self-conscious beings from inanimate objects. The essence of the Gödelian formula is that it is self-referring. It says that "This formula is unprovable-in-this-system." When carried over to a machine, the formula is specified in terms which depend on the particular machine in question. The machine is being asked a question about its own processes.\(^{111}\)

The machine is incapable of becoming self-conscious. It is locked into the system. The mind, on the other hand, can use the system to step outside of it. It can recognize both the necessity of the system and its implicit contradictions. It is the very insufficiency of the systems which the mind creates that allows for the imaginative reconstruction of new systems.

Lucas recognizes that "it is implausible to reconstrue truth
as provability-in-a-given system, and [that] Gōdel's theorem shows this . . . ."112 Whatever truth is, it is not that which can be encapsulated in the positivist dream. Lucas, however, is not willing to relinquish the possibility that the human mind is able to grasp truth, even though he is willing to admit that "truth cannot be precisely defined."113

"If truth is not provability-in-a-given-system" a tough-minded philosopher may ask "what is it?" I cannot answer him. I think I know what truth is, but I know I cannot tell anybody else exactly what it is. I can recognize—subject to many mistakes, errors, and oversights—various propositions, formulae, statements and theories as true, or come to that conclusion after due consideration. In particular cases I can explain why, and often hope to convince somebody else as well. But I cannot produce a formula which will cover all cases, or frame an instruction which somebody else could apply mechanically in all cases . . . .114

This also means that no absolute truth can be found and parallels the change in scientific vision which relativity and quantum mechanics inaugurated. Gōdel's formula, at least for Lucas, dispells the "bogey of mechanist determinism" which was dominate "since the time of Newton."115

We can produce models and explanations, and they will be illuminating; but, however, far they go, there will always remain more to be said. There is no arbitrary bound to scientific enquiry: but no scientific enquiry can ever exhaust the infinite variety of the human mind.116

Clearly, this science is a long way from Cleanth Brooks's assertion that "a scientific proposition can stand alone. If it is true, it is true."

Karl Popper's theory of science, designed to establish what he
calls the "demarcation" between science and metaphysics, also finds Gödel's formula to be significant. Popper's goal is to explain what makes a scientific theory valuable, and his influential program bridges an objective, nineteenth-century theory of science with some of its more modern antecedents. In one sense his whole program is an attack on positivism. To begin with, he refuses to accept the nominalist's position, for he realizes that to do so would make scientific development an impossibility. "A purely nominalistic language," he writes, "is completely inadequate for any scientific purpose." He goes on:

It is clear that in such a language hypotheses cannot be formulated. It cannot be a language of science. And conversely, every language adequate for science must contain words whose meaning is not given in an enumerative way. Or, as we may say, every scientific language must make use of genuine universals, i.e., of words, whether defined or undefined, with an indeterminate extension, though perhaps with a reasonably definite intensional "meaning."

Discovery means change, and change means that the language of science cannot be closed; it must be open to the possibilities of reformulation. Popper recognizes the nominalist position that "only empirically definable words or signs have meaning" reduces science (or any usage of language for that matter) to a closed and tautological system. In other words, a view which reduces all non-logical operative signs to names can never allow for anything but analytic judgments which, in turn, means that the entire question of truth has been trivialized in order to make it apparently susceptible to consistency.

Popper also recognizes that positivism is completely annihi-
lated by Gödel's thesis. He finds it surprising that Gödel's result did not produce that change which it should have produced in the Vienna Circle's tenets . . . concerning the language and the scope of science.\textsuperscript{120} It is, in fact, impossible to remove the paradoxical from language and the search for absolute definitions which can be used in a universal and fixed scientific language is fruitless. Popper asks what is "behind the demand for definitions?"

An old tradition, reaching far beyond Locke to Aristotelian essentialism; and as a result of it, a belief that, if a man was unable to explain what a word meant which he used, then this showed that 'he had given no meaning' to it (Wittgenstein), and had therefore been talking nonsense. But this Wittgensteinian belief is nonsense, since all definitions must ultimately go back to undefined terms.\textsuperscript{121}

It is clear to Popper that "it would have been best . . . to scrap forthwith [the] doctrine of the one universal language of the one universal science" since Gödel's "incompleteness theorems had proved that one unified language would not be sufficiently universal for even the purposes of elementary number theory . . . ."\textsuperscript{122} For Popper this is not an unfortunate situation; although, on the one hand, it does not allow for the attainment of some absolute truth, it does allow, on the other hand, for the growth of knowledge. All language depends upon self-reference. To deny this is to destroy the possibility of meaningfulness entirely. Popper is happy to admit that "there is not a classic of science, or of mathematics, or indeed a book worth reading that could not be shown, by a skillful application of the technique of language analysis, to contain many meaningless pseudo-propositions and what some people might call 'tautolo-
Popper's "demarcation" of science then is based on a rejection of the "verifiability criterion of meaning." For Popper, this criterion excludes from the realm of meaning all scientific theories (or "laws of nature"); for these are no more reducible to observation reports than so-called metaphysical pseudo-propositions. Thus the criterion of meaning leads to the wrong demarcation of science and metaphysics.

The crux of Popper's theory of science is that the verifiability of a scientific "conjecture" is simply not possible. The truth of a theory cannot depend upon observation. "Hume," Popper feels, "was perfectly right in pointing out that induction cannot be logically justified." Science, however, does not proceed by the inductive method. The scientist does not begin with observations and then arrive at an hypothesis. Popper is quite clear about this: "... the belief that we can start with pure observation alone, without anything in the nature of a theory, is absurd."

It is quite true that any particular hypothesis we choose will have been preceded by observations—the observations, for example, which it is designed to explain. But these observations, in their turn, presupposed the adoption of a frame of reference: a frame of expectations: a frame of theories. If they were significant, if they created a need for explanation and thus gave rise to the invention of a hypothesis, it was because they could not be explained within the old theoretical framework, the old horizon of expectations.

Accumulating data demands presuppositions. Thus, science proceeds by "conjectures and refutations." Conjectures, or theories, are "free creations of our own minds, the result of an almost poetic intuition ..."; they are not determined by either observations or by
previous theories, although they arise in conjunction from both. Moreover, conjectures can never be verified, since they are not deducible from observational data. Conjectures, for Popper, can only be refuted; that is, they can be tested and found wanting. In fact, if they are good theories they will be refuted, at least eventually, for although Popper refuses to reject the objectivist's understanding of truth, he stresses that the scientist can never knowingly arrive at this vision of truth. The "verificationist" demands the acceptance of "a belief only if it can be justified by positive evidence . . ."\textsuperscript{130} For "falsificationists," like Popper, however, "science has nothing to do with the quest for certainty or probability."

We are not interested in establishing scientific theories as secure, or certain, or probable. Conscious of our fallibility we are only interested in criticizing them and testing them, in the hope of finding out where we are mistaken; of learning from our mistakes; and, if we are lucky, of proceeding to better theories.\textsuperscript{131}

What the scientist looks for is not just truth, but "interesting truth—truth which is hard to come by."\textsuperscript{132}

There is much in this view that Bronowski admires. For Bronowski Popper's philosophy of science is a "humanist view" and it helped to "reestablish" the "credit" and "relevance" of philosophy in the "face of authoritarianism."\textsuperscript{133} Bronowski admires Popper because he revealed science to be, not a system, but an activity which can never become "a finished enterprise."\textsuperscript{134} Unlike the positivists, whose "eyes were always fixed (somewhere on the horizon) on a finished scientific
system,\textsuperscript{135} Popper taught Bronowski that "there is no \ldots ideal
system that might embrace the whole of nature."\textsuperscript{136} 

\ldots he insisted in his philosophy as much as
in his life that there is no final sanction and
authority for knowledge, even in science; that
only that is knowledge which is free to change and
grow; and that a condition for its growth is the
challenge by independent minds.\textsuperscript{137}

Bronowski takes this view as well, but he reshapes it\textemdash strengthens
it\textemdash in order to put forth a philosophy of science which is even
more humanistic; one which is based squarely upon the powers of
language and the imagination.

There are two facets of Popper's view with which Bronowski
takes issue, and he rejects them with a simple but powerful reason-
ing. Bronowski admits that the doctrine of falsification is a good
antidote to the verificationists' dream of objectively established
truth, but he also recognizes that a theory cannot be falsified any
more decisively than it can be validated. Bronowski agrees that

Popper rightly criticized verification because it
must be inconclusive; but in the fundamental theories
of modern science, falsification can do no better\textemdash
and no worse. Both offer evidence, for or against
a theory, and no more.\textsuperscript{138}

The problem is once again the charge from Hume. (Bronowski, however,
does not mention Hume by name.) If any finite set of data must con-
tain some probability that the particular sample in that set is an
unlikely sample from the infinite totality of possibilities, there
is no way of knowing that an experiment has not simply selected an
unlikely sample.
When a theory predicts several possible outcomes of an experiment, it is hard to tell what set of outcomes is different enough from a predicted set to falsify the theory. Strictly speaking, we ought no doubt to say that it is impossible to tell. The predicted outcomes of a string of experiments are all the possible samples of that size from the postulated distribution; and whatever the actual outcomes are, they certainly form a possible sample.\textsuperscript{139}

There is no way to prove a theory false; improbability does not equal falsification. "Nature provides no decisive test to prove a theory false if it makes only probable predictions."\textsuperscript{140} Science is of necessity dogged by errors; it must constantly be faced with uncertainty. Hence, for Bronowski, the doctrine of falsification, just as the doctrine of verification, can never be a "prescription" but merely a "strategem for decision."\textsuperscript{141} Decisions must be made, or else science will be brought "lamently to a standstill"\textsuperscript{142} but truth can neither be absolutely verified nor can falsity be exposed with certainty.

The second facet of Popper's view which Bronowski finds wanting is Popper's notion of "verisimilitude," that although a theory can never capture absolute truth, some theories can be shown to be more truth-like than others. Bronowski asks which of two theories, "neither of which claims to be true," has "the better claim to our confidence."\textsuperscript{143}

The one that is nearer to the truth, says Popper: theories form a progression from less true to more true, and the growth of knowledge is an asymptotic approach toward the truth. Popper grants that we cannot know what theory will be true, and we cannot expect to reach it; nevertheless, he holds that we can measure which of two theories contains more truth than the other.\textsuperscript{144}
Bronowski objects to this view; in the first place, he argues, it makes no sense to assert that one theory is closer to the truth than is another if it is not possible to know what the true theory is from the start.

Indeed, it does not make sense to say that an explanation is approaching the truth when we do not know the true explanation and must therefore foresee that it may have an altogether different and unforeseeable form. How could we have anticipated that a better theory than Newton's would have the form of relativity? So long as we are comparing theories as explanations, the correspondence view of truth cannot give us a yardstick which will measure that one is closer to the unknown truth than the other.145

In the second place, if the "true theory," the "ultimate theory," actually exists, it "would have to encompass all effects at once, and would no longer be an explanation as we understand that, but a gigantic register or description of them all."146 This would imply that "nature is a closed mechanism," that it is "the memory store of a universal computer," and this hypothesis is one which both Bronowski and Popper adamantly reject.

For Bronowski the value of a theory is not its truth to fact but rather its level of imaginative explanatory power. The lessons of modern physics are ones that Bronowski has learned well. Einstein and quantum mechanics taught us, Bronowski says in The Identity of Man, that "we get a false picture of the world if we regard it as a set of events that have their own absolute sequence and that we merely watch."147
Nature is a network of happenings that do not unroll like a red carpet into time, but are intertwined between every part of the world; and we are among those parts. In this nexus, we cannot reach certainty because it is not there to be reached; it goes with the wrong model, and the certain answers ironically are the wrong answers. Certainty is a demand that is made by philosophers who contemplate the world from outside. . . . 148

Scientific knowledge then, like all knowledge, flows from the interconnection of the inside and the outside. It is, for Bronowski, a knowledge of experience, and thus it defies certainty for "no knowledge can be certain that continues to expand with us as we live inside the growing flesh of our experience." 149 The picture that the scientist creates of the world is not a mere passive recording of a flat and objective space. There is no such thing. On the other hand, it is not a mere fiction for that would imply no contact with anything outside the mind. It is an experiential picture, and "our experiences do not merely link us to the outside world; they are us and they are the world for us; they make us part of the world." 150

Bronowski argues forcefully that what makes a scientific theory valuable is not its correspondence to the facts but its degree of imaginative coherence. He laments the harm done "to children in their education when we accustom them to separate reason from imagination, simply for the convenience of the school time table." 151 There are always an "endless number of theories which can account for all the known facts," 152 and consequently "the truth of science is not truth to fact . . . ." 153 Rather, when a scientific theory is pronounced as "true" it is because a "judgement" has been made
"between what matters and what does not." A valuable theory is an imaginative construct which gives an "aesthetic fulfillment" because it expresses a "deep relation between the human mind and the world which it matches." Valuable research in science "carries the sense of drawing together the threads of the world into a patterned web."

A theory does not simply state the facts: it shows them to flow from an inner order and imaginative arrangement of a few deep central concepts. That is the nature of a scientific theory, and that is why . . . it [is] a creation of the human mind.

What makes a theory attractive is the organic coherence of the parts. Creating a theory involves the extension of the imagination from the experiences of the past into a new realm of experience, which, in turn, must point to the future in an openended way. There can never be finality in a theory, but there is a struggle for an ever greater coherence where the pieces, in Bronowski's words, "fit together like the characters in a great novel, or like the words in a poem."

To understand more fully the origin of the imaginative element in a scientific theory, attention must be paid to the significance which Gödel's proof has for Bronowski. Like Popper, Bronowski also recognizes the importance of Gödel's theorem, and in fact, it becomes the linguistic grounding of his understanding of imaginative creation. It is, therefore, worth quoting his interpretation of Gödel's thesis at some length:
In the first place, not all sensible assertions in the language of the system can be deduced (or disproved) from the axioms: no set of axioms can be complete. And in the second place, an axiomatic system can never be guaranteed to be consistent: any day, some flagrant and irreconcilable contradiction may turn up in it. An axiomatic system cannot be made to generate a description of the world which matches it fully, point for point; either at some points there will be holes which cannot be filled in by deduction, or at other points two opposite deductions will turn up. And when a contradiction does turn up, the system becomes capable of proving anything, and no longer distinguishes true from false. That is, only an axiom which introduces a contradiction can make a system complete, by making it completely useless.\textsuperscript{160}

It follows from this that in the pursuit of scientific understanding new axioms, new theorems, new formulae must be added from time to time since at no point in the history of science can the formulae be complete. When new theorems are added, by the invention of a "great mind," the method by which they are developed "cannot itself be mechanized."\textsuperscript{161} There is no way to "formalize" what Bronowski calls "the pregnant decision."\textsuperscript{162}

It is a free play of the mind, an invention outside the logical processes. This is the central act of imagination in science, and it is in all respects like any similar act in literature; it can, in fact, be taken as a definition of imagination. In this respect, science and literature are alike: in both of them, the mind decides to enrich the system as it stands by an addition which is made by an unmechanical act of free choice.\textsuperscript{163}

This act of "free play," Bronowski argues, arises from the ambiguity and uncertainty which is inherent in language. It arises from the interplay of two languages.
These two languages, "an inner one and an outer one,"\textsuperscript{164} are languages that all human beings possess. Fascinated by the evolutionary development of language, and borrowing from Jakobson, Bronowski hypothesizes that the birth of human language must have occurred simultaneously with the invention of a tool to make other tools. Before this point in man's evolution the use of "language" was limited to formulating messages, or instructions, without any self-conscious awareness. With the birth of the idea that some tools can be used to make other tools, however, there is also the recognition that messages can be analyzed, can be broken down into discrete units and that, in fact, the recognition of the synthetic activity of putting words together is first dependent upon seeing that the synthetic whole can be made up from discrete parts.\textsuperscript{165} (The parallel with G\"odel's theorem is clear; the use of a tool to make a tool is a self-refer- ring act.) Bronowski realizes that "nature did not present us ready-made with atomic units which we use to build up larger messages."\textsuperscript{166} Instead, "man created the units for himself by analyzing his own messages."\textsuperscript{167} In this process a certain "internalization" of the parts takes place.

When language is internalized, it ceases to be only a means of social communication, and is thereby removed from the family of animal languages. It now becomes an instrument of reflection and exploration, with which the speaker constructs hypothetical messages before he chooses one to utter. In time, the sentences that he makes for himself lose the character of messages, and become experimental arrangements of the images of past experience into new and untested projections.\textsuperscript{168}
The fact that this internalization is a self-referring act demands that the inner language be filled with ambiguities. "This is because the inner language includes assertions about language as well as about nature; and this makes it impossible to construct a closed language from it."\(^{169}\)

Bronowski's view has a certain Cassirer-like ring to it, except that there is no momentary-god experience which man can knowingly recapture through language. Self-consciousness is born at the same time as language and there is no return to, nor a desire to return to, some more primitive language usage. The outer language is the language of culture, and it is provisionally fixed. It can never be finally fixed, however, because it is a transformation of the inner language. We may try, Bronowski cautions, "to turn the outer language into a formal description of reality in which we can communicate rigorously without ambiguity," but this, fortunately, is an impossibility. If it were possible to do so, "the outer language would be finally closed, and our inner language would have nothing to contribute to it except confusion."\(^{170}\) In short, there would be no creation and man would cease to be what he is.

This creative potential is what makes science possible. "There is no way," Bronowski puts it in *The Identity of Man*, "to avoid some ambiguity in every human language and, in spite of appearances, the language of science is no exception."\(^{171}\) As he explains in *A Sense of the Future*, the imaginative invention in science
begins in the multiple meanings and overtones, the hidden ambiguities, which human language contains in spite of our best efforts to make it sharp. The language of thought consists for the most part of general words, and although such a word may be as matter of fact as "parallel," as solid as "mass," or as down to earth as "table," there is always about it a penumbra of uncertainty and ambivalence from which new relations may suddenly become apparent. "Parallel" may become the beginning for non-Euclidean geometries, and "mass" may become equivalent to energy . . . 172

Science must grow, and thus the terms of science must always be richer than the logical formulations which construct systems from the sum of the parts. 173 Science may try to make the outer system closed; indeed, this is its goal, and this forms what Bronowski calls the "paradox of imagination in science." 174 It tries to sort out all of the ambiguities in the inner language, but this process only attests to the richness of meaning which is always available. The linear arrangement of parts fitting into a mechanical order can never satisfy the imaginative impulse. Like Lucas, Bronowski sees Gödel's theorem as proof that the mind is not a logical machine, "because no logical machine can reach out of the difficulties and paradoxes created by self-reference." 175 The scientific and imaginative mind can do so, but when it does, when it leaves "one system and [is] about to enter and form" another, it is in a "no-man's-land outside logic," 176 and hence the logical systems which are created by this act are only provisional; they can never exhaust the fullness of the mind from which they arise.

It is for this reason that Bronowski senses a similarity between science and literature. They are not different in kind; there is a
"common quality of imagination in science and literature" and it is traceable to the "logic of self-reference." The difference between the two endeavors, then, is one of degree; the difference "reflects . . . the different extent to which self-reference enters their language." Moreover, for Bronowski, "neither science nor literature ever gives a complete account of nature or of life." Science tries to clear away all of the paradoxes of the inner language and to state truth in an unambiguous outer language. Literature tries to unite the inner language of the self with the outer language which it must use. It thus sustains the ambiguities and "takes its life from the dual tension between watching our own minds from the inside and watching someone else's from the outside." But the "language of poetry uses words that stand for concepts just as those of science do." The "language of poetry attempts to transcribe directly into the reader's own inner language," but "inner languages cannot be made identical," and thus the poet must use the concepts of the outer language to form a context for the whole. Science, on the other hand, states its formulae in the "outer language which writer and reader share by their scientific education" and thus tries to disentangle all of the ambiguities. But in science the valuable formula "was not made in the outer language and could not have been made." It must arise from the "human ability to experiment in the inner language." Thus, there is in both science and literature always a tension between these languages. They form a whole, but it is a dialectical whole, reflecting the interplay of what Bronowski calls
the "inseparable halves of the identity of man."\textsuperscript{186}

What one sees in Bronowski is a scientist of great intellect and personal optimism. Admitting that man is incapable of formulating any absolute truth because his symbolic systems cannot maintain fixity, Bronowski does not succumb to an intellectual despair. On the contrary, he sees this circumstance as offering the possibility for an imaginative and creative activity which is uniquely man's. On the one hand, the outer language, formalized by the science of any one period, provides the communicative link for a scientific culture; this can never be ignored because it provides the condition from which change can arise. On the other hand, however, the outer language, as cultural or scientific norm, is always only provisional; it can never finally fix the inner language which it needs as an activating force. Consequently, Bronowski does not speak of truth as a finished product but as a "process of discovery."\textsuperscript{187} This implies a continuity of tradition and demands a respect for the past.

This is a view of history which both Popper and Bronowski share. Science is not for Popper simply the "accumulation of knowledge."\textsuperscript{188} Rather, a scientist must try to "continue . . . a line of inquiry which has the whole background of the earlier development of science behind it."\textsuperscript{189} Popper agrees that

\ldots one might at first sight believe that for the accumulative growth of knowledge tradition would be very important, and that for the revolutionary kind of development tradition would be less important. But it is exactly the other way around. If science could grow by mere accumulation, it would not matter so much if the scientific tradition were lost, because any day you could start accumulating afresh.
But, of course, one cannot start "accumulating afresh." For Popper the scientist "must carry on a certain tradition." The tradition provides a mapping of the intricacies of the world, but this is a mapping from which one moves to the future. As a map for change, it pulls the past into the future. Bronowski also makes a similar point, and perhaps his way of putting it is more fulfilling:

The old and the new are linked by respect for each man and his work, not as an achievement but as an example, a shining way of working. This is the true meaning of progress in science: that the past is respected in the present . . . . Progress is not a graveyard of the obsolete but a living history.

For Bronowski science must "respect the man's way of working more than what he finds, because the process of discovery is more important to it than any discovery." This concern with history and tradition has become the focus of other recent philosophies of science; it is the subject of the next section. There it will become equally clear that the imaginative discoveries of science are tied to the interpretive possibilities which arise from new utilizations of language.

A New Science: The Historical Dimension

In the third quarter of the twentieth century there has occurred what Dudley Shapere calls a "revolution . . . in the philosophy of science." Shapere is referring to the "profound influence shaping the new trends in the philosophy of science [which] has come from results attained by the newly professionalized discipline of the history of science." Like Bronowski and Popper, these proponents
of what Shapere has labeled the "new philosophy of science" are members of a growing "revisionist" movement which is dissatisfied with the positivist program. Finding the positivists' focus on the "finished" product of a scientific theory to be misplaced, such theorists as Stephen Toulmin, T. S. Kuhn, N. R. Hanson, and Michael Polanyi have attempted to revitalize the philosophy of science by drawing attention to the process of scientific discovery. Their approach thus involves a concentration on the history of science, on the relationship between the individual scientist and the tradition to which he belongs. In refocusing attention on this historical dimension, all four of these theorists argue that in interpreting the meaning of natural phenomenon a presuppositionless approach to understanding is not possible. Moreover, to varying degrees, they all argue that the presuppositions which the scientist as interpreter brings to the study of the natural world, as well as historical shifts in these presuppositions, are "intimately tied," as Frederick Suppe puts it, to the "language which conceptually shapes the way one experiences the world."\(^{196}\) In brief, these historian-philosophers of science present a view of change and discovery which places the relationship of tradition, meaning, and language into an intricate interpretive web.

Probably the most well-known member of this group is Thomas Kuhn, whose *The Structure of Scientific Revolutions* has received a wide reading and found an influence in other fields besides science. The central term of Kuhn's approach is "paradigm," a term which
denotes the shared model of a scientific community "from which spring particular coherent traditions of scientific research."\(^{197}\)

A paradigm embodies the particular way that a scientist looks at the world and is more highly pronounced and more specifically delineated in those periods of what Kuhn calls "normal science," i.e., those more stable periods of scientific endeavor which are devoted to applying and extending the theories of a particular scientific worldview. A paradigm comes into existence when it has secured enough support to attract practicing scientists to it and away from its competitors. It thus provides the presuppositions needed for scientific work and defines what counts as a "scientific" explanation. As Kuhn expresses it,

\[
\ldots \text{one of the things a scientific community acquires with a paradigm is a criterion for choosing problems that, while the paradigm is taken for granted, can be assumed to have solutions. To a great extent these are the only problems that the community will admit as scientific or encourage its members to undertake. Other problems, including many that had previously been standard, are rejected as metaphysical, as the concern of another discipline, or sometimes as just too problematic to be worth the time.}^{198}
\]

A paradigm, however, "never does \ldots explain all the facts with which it can be confronted."\(^{199}\) Kuhn is clearly opposed to the view of science which sees it as the accumulation of facts. Science will never arrive at the paradigm which will allow for the encapsulation of some objective truth. "It is hard," Kuhn promises, "to make nature fit a paradigm."\(^{200}\) This open-ended characteristic of the paradigm is what allows normal science to continue. The scientist who adopts a particular paradigm is con-
fident enough of what counts as scientific procedure to continue putting together the final pieces of the puzzle, hoping to make the paradigm complete:

The existence of this strong network of commitments—conceptual, theoretical, instrumental, and methodological—is a principal source of the metaphor that relates normal science to puzzle-solving. Because it provides rules that tell the practitioner . . . what both the world and his science are like, he can concentrate with assurance upon the esoteric problems that these rules and existing knowledge define for him.

Thus, periods of normal science are defined by the scientific paradigms they articulate. The paradigms are never completely closed, but Kuhn suggests that normal science can never "correct" those paradigms. Normal science points up anomalies which can lead to a period of scientific "crisis," demanding the creation of a new paradigm.

It is thus through the historical tension of periods of normal science and periods of crisis, or "scientific revolutions," that Kuhn reads the process of scientific change. There may be something inconsistent in Kuhn's desire to see scientific change as so radically revolutionary, especially given his interest in the formative influence which tradition (in the form of an old paradigm) has upon the development of later paradigmatic models. Indeed, it is part of his thesis that "new paradigms are born from old ones" and that they "incorporate much of the vocabulary and apparatus, both conceptual and manipulative, that the traditional paradigm had previously employed." Change can only arise from within the tradition, and in fact it is the presuppositions of a paradigm which
define what can appear as an anomaly and what not; hence, Kuhn's overall thesis may not necessitate the sort of radical discontinuity which the term "revolution" implies. This apparent inconsistency is not crucial, however, and is probably due more to Kuhn's desire to emphasize the impossibility of interpreting the natural world without first having presupposed what is worth interpreting (i.e., what counts as phenomena) and what constitutes an interpretation (i.e., what counts as scientific explanation or theory). The difference between the presuppositions inherent in different world-views may not always be as quantitatively large as Kuhn's emphasis on the revolutionary nature of change implies. It is enough that the differences be critical in order to sustain his argument. It is enough if a new paradigm, to use Kuhn's own words, "seldom employ[s] these borrowed elements [of the older paradigm] in quite the traditional way." 203

The point that Kuhn, sometimes reluctantly, strives to make is that not only do particular paradigms determine the "legitimacy both of problems and of proposed solutions" 204 but that they are "constitutive of nature as well." 205 Borrowing from Gestalt psychology, Kuhn proposes that accustomed perceptual patterns have a great deal to do with the discovery of an object within a perceptual field. Applying this principle to scientific discovery means, as Kuhn recognizes, that "paradigm changes do cause scientists to see the world of their research-engagement differently" 206 and that "in so far as their only recourse to that world is through
what they see and do, we may want to say that after a revolution scientists are responding to a different world."207 Thus, when Aristotle observed a swinging pendulum, he concluded, as was projected by his scientific paradigm, that bodies tended to their natural state of rest. Galileo, on the other hand, who "was not raised completely as an Aristotelian,"208 observed from the exact same stimuli a different phenomenon and was lead to postulate the independence of weight and rate of fall. Kuhn asks if there "is any legitimate sense in which we can say that they pursued their research in different worlds?"209 He comes to an uncomfortable and tentative "yes."

Far more clearly than the immediate experience from which they in part derive, operations and measurements are paradigm determined. Science does not deal in all possible laboratory manipulations. Instead, it selects those relevant to the juxtaposition of a paradigm with the immediate experience that that paradigm has partially determined. As a result, scientists with different paradigms engage in different concrete laboratory manipulations. The measurements to be performed on a pendulum are not the ones relevant to a case of constrained fall.210

Still, in The Structure of Scientific Revolutions Kuhn is not willing "to relinquish entirely" the view that theories are "man-made interpretations of given data."211 Yet he clearly recognizes that this objectivist vision "no longer functions effectively, and the attempts to make it do so through the introduction of a neutral language of observations . . . seem . . . hopeless."212

Since 1962 Kuhn has apparently come to feel more comfortable with his thesis. He has also reworked some of his old terminology
in order to clarify his original position. He now uses the term "disciplinary matrix" instead of paradigm and thus is better able to distinguish between the world-view which informs particular theories and what he now calls "exemplars," the "concrete problem solutions" which both help form the disciplinary matrix and are in turn defined by it.\textsuperscript{213} That there is a circular relationship here is quite evident, but this is hardly new to Kuhn's thinking. In The \textit{Structure of Scientific Revolutions} this can be seen in two ways. First, if it is a given paradigm which determines what counts as a "fact," it is also the "facts" which substantiate the paradigm. Second, if the presuppositions of a given paradigm allow for the relatively consistent interpretation of phenomena, they also give rise to the inconsistencies which allow for a change in paradigms. In Kuhn's 1973 article, "Second Thoughts on Paradigms," the same circular relationship is apparent and is perhaps even extended, for it allows him to "resist the implication" that the question of whether interpretations are imposed on reality or arise from pre-given data "must have a yes or no answer."\textsuperscript{214} Kuhn is much more content to accept that, in one sense, "learning a similarity relationship is learning something about nature that is there to be found" but that "in another sense the group does put them there (or find them already there) . . . ."\textsuperscript{215} Thus, the unfolding of the natural world both determines the possible disciplinary matrices which may be employed and is determined by the questions available in a particular world-view.

There is, however, one feature of Kuhn's thesis which has
received more emphasis in his later writings, and this is the role which symbolic formulation plays in the generation and communication of scientific paradigms. From the beginning Kuhn has been dissatisfied with the positivistic program of a neutral observation language and one-to-one correspondence rules. Instead, he has argued for a contextual theory of meaning. In discussing Boyle's definition of an element in The Structure of Scientific Revolutions, for example, he suggests that the textbook treatment which represents Boyle's definition as something "developed or invented" misrepresents the real activity of scientific discovery-interpretation. It is worth quoting at some length:

Boyle's definition, in particular, can be traced back at least to Aristotle and forward through Lavoisier into modern texts. Yet that is not to say that science has possessed the modern concept of an element since antiquity. Verbal definitions like Boyle's have little scientific content when considered by themselves. They are not full logical specifications of meaning (if there are such), but more nearly pedagogic aids. The scientific concepts to which they point gain full significance only when related, within a text or other systematic presentation, to other scientific concepts, to manipulative procedures, and to paradigm applications. It follows that concepts like that of an element can scarcely be invented independent of context. Furthermore, given the context, they rarely require invention because they are already at hand. Both Boyle and Lavoisier changed the chemical significance of "element" in important ways. But they did not invent the notion or even change the verbal formula that serves as its definition. Nor, did Einstein have to invent or even explicitly redefine "space" and "time" in order to give them new meaning within the context of his work.216

This view of contextual meaning also suggests a circular activity. The meaning of a scientific term is known by its context and the
context is known by the meaning of its terms. Clearly, this parallels Kuhn's attention to the interconnection between paradigm and supporting data. Recently, Kuhn has given this view that the terms "are already at hand" even greater emphasis.

In addition to the relationship between disciplinary matrices and exemplars Kuhn is concerned to show how the meaning of symbolic formulations arise from the study of exemplars and help determine the nature of a particular community's world-view. Interested in the "language-nature link," Kuhn argues that the "problems of attaching word-strings to nature must be considered central to philosophy of science." Kuhn's thesis is that different scientific communities interpret the same symbolic statements in different ways, depending upon the problems they set for themselves and the view of scientific endeavor that they hold.

In the sciences, particularly in physics, generalizations are often found already in symbolic form: \( f = ma, I = V/R, \ldots \). Others are ordinarily expressed in words: "action equals reaction," "chemical composition is in fixed proportions by weight," or "all cells come from cells." No one will question that the members of a scientific community do routinely deploy expressions like these in their work, that they ordinarily do so without felt need for special justification, and that they are seldom challenged at such points by other members of their group.

However, this means only that "no difficulties" will be raised "for the man who inscribes the four symbols \( f, =, m, \) and \( a \) in a succession on a line . . . ." What is more at issue is what these terms and their inscription indicate; Kuhn's argument is that "different
disciplinary matrixes attach different meanings to the terms occurring in their constituent symbolic generalizations."221 This, in turn, means that different groups will arrive at different theories since a theory is "a collection of symbolic generalizations with specific meanings attached to its constituent terms."222 Thus, at any one stage of scientific growth—or within any one disciplinary matrix—the meaning of symbolic formulations is determined by the problems and world-view which that particular group entertains.

By the same token, however, it is a "community's past practices" which determine what is to be counted as a symbolic generalization worth examining. Kuhn is fond of referring to a string of symbols as being "uninterpreted," but it would be more in keeping with his thesis to say that they are "reinterpreted." His reason for using the term, however, is obvious: he wishes to make clear that the signs are empty until a "homogeneous community" gives them meaning by determining to what problems and solutions they are relevant.

It is vastly easier [he writes] to discover that scientists say to each other "force equals mass time acceleration" than to discover what the devil they mean or are talking about when they say it. Though the expressions are interpreted by the men who use them, discovering the signs and discovering their interpretation are partially separate operations.223

Nevertheless, since any member of a scientific community grows up in a situation which already attaches meanings to the symbols utilized, Kuhn admits that terms become "'implicitly defined' as a result of learning to apply symbolic generalizations to nature."224 But this
cannot be the end of the story, for if it were, there would be no possibility for change and clearly it is to understand change that Kuhn directs his attention. He feels "sure," for example, that there is "such a thing as meaning change or change in the range of application of a term."^225 He rejects "a standard that demands our possessing necessary and sufficient conditions for the applicability of a word or phrase in a world of all possible data. In a world in which some data never appear, such a criterion is superfluous."^226

What this must mean is that within the scientific tradition terms and formulae are passed on to be reinterpreted, to be given new meanings that arise partly from the direction of the tradition itself. This obviously parallels the notion that it is a particular paradigm that determines the anomalies which eventually restructure the paradigm. Kuhn is still attracted to major change as being "revolutionary," and thus he feels that it is during such periods of crisis that terms are more likely to be formulated:

I suspect that, quite generally, scientific revolutions can be distinguished from normal scientific developments in that the former require, as the latter do not, the modification of generalizations which had previously been regarded as quasi-analytic. Did Einstein discover the relativity of simultaneity or did he destroy a previously tautologous implication of that term?^227

Kuhn has, however, somewhat weakened his emphasis here since the sort of radical discontinuity which the notion of revolution entails makes the relationship of two paradigms perhaps more incommensurable than even he would like. When pressed by Patrick Suppe, for example, he writes:
Much of [Suppe's] argument rests on his conclusion that my view require "the possessors of different disciplinary matrices [to] attach different meanings to whatever words they have in common." But I can see no reason for any such conclusion: "some difference in some meanings of some words they have in common" is the most I have ever intended to claim. 228

In either case, the thrust of Kuhn's thesis is not affected: scientific terms are in themselves devoid of meaning and thus continually invite reinterpretation which is determined by the world-view of a particular scientific community, the problems it allows, and the larger tradition to which it belongs.

Although Kuhn is probably the best known of these "new philosophers of science," both Stephen Toulmin and N. R. Hanson put forward similar views before Kuhn wrote The Structure of Scientific Revolutions. Toulmin, for example, also argues that scientific discovery depends upon paradigms or what he calls "ideals of natural order." In Foresight and Understanding he suggests that the "preconceptions" that a scientist has about the type of coherence which inheres in nature have a profound effect upon the laws and theories which he generates. These ideals of natural order are not biases which arise in the laboratory.

Their influence is felt earlier. For though Nature must of course be left to answer our interrogations for herself, it is always we who frame the questions. And the questions we ask inevitably depend on prior theoretical considerations. We are here concerned, not with prejudiced belief, but rather with preformed concepts; and, to understand the logic of science, we must recognize that "preconceptions" of this kind are both inevitable and proper—if suitably tentative and subject to reshaping in the light of our experience. 229.
Like Kuhn's notion that a paradigm cannot fit all the facts, Toulmin's "ideals of natural order" generate the assumed expectations which allow particular phenomena to appear, some of which will deviate from the assumed order and therefore require explanation. A major change in the view of natural order, for example, occurred when Aristotle's paradigm that bodies tend toward rest was replaced by Newton's axiomatic rule that bodies continue in motion unless otherwise constrained:

any dynamical theory involves some explicit or implicit reference to a standard case or "paradigm." This paradigm specifies the manner in which, in the natural course of events, bodies may be expected to move. By comparing the motion of any actual body with this standard example, we can discover what, if anything, needs to be regarded as a "phenomenon." If the motion under examination turns out to be a phenomenon—i.e. "an event whose cause is in question" as being "highly unexpected"—the theory must indicate how we are to set about accounting for it.230

In fact, "every step of the procedure—-from the initial identification of 'phenomena' requiring explanation to the final decision that our explanation is satisfactory—-is governed and directed by the fundamental conceptions of the theory."231

The major difference between Kuhn and Toulmin's accounts of change is that Toulmin subscribes to a more evolutionary than revolutionary view. "We need," he writes, "to see scientific thought and practice as a developing body of ideas and techniques. These ideas and methods, and even the controlling aims of science itself, are continually evolving, in a changing intellectual and social environment."232 But if Toulmin takes a less radical view of
paradigm change than does Kuhn, he too argues that understanding the meaning of a theory, which has been advanced within one ideal of natural order, is most difficult when the interpreter stands in a different paradigm. This is largely due to the meaning of words. For Toulmin the advancement of a new theory involves a "language shift," where words which have been used previously in one context are made to assume new meanings in the context of a different ideal of natural order.233 One can always "distinguish," he cautions, "between an account of [a] theory in the new terminology—in 'participant's language'—and an account in 'onlooker's language'."234 For Toulmin the meaning of terms is clearly context dependent. "In formalized sciences such as physics . . . the terminology is not fixed" before it is presented in the theories or formulae which it constitutes.235 Moreover, Toulmin evidences a deep respect for the historical tradition which has given rise to present day scientific activity. In fact, the "earlier enquiries in natural philosophy that are [sometimes] swept aside as 'pre-scientific'" are actually "indispensable,"236 and thus "the ideas of science represent a living and critical tradition."237 The problem is that it is very difficult to understand the past, for standing in the present demands a certain presuppositional stance which is inherent to the contemporary ideal of natural order.
There is only one way of seeing one's own spectacles clearly; that is, to take them off. It is impossible to focus both on them and through them at the same time. A similar difficulty attaches to the fundamental concepts of science. We see the world through them to such an extent that we forget what it would look like without them: our very commitment to them tends to blind us to other possibilities.238

This "invisibility of our intellectual spectacles" often leads "us to misunderstand, not only the specific ideas and doctrines put forward by earlier thinkers, but also the general character of their enquiries."239 That the perspective focused by these "intellectual spectacles," to continue the analogy, is language-dependent is clear, given Toulmin's overall thesis. Thus, it may prove even more difficult to understand one's own preconceptions than even Toulmin realizes. But if the ability to focus clearly on the presuppositions one holds is highly problematic, it is, at least, partly possible and is what allows the "intellectual variations" which are "perpetuated" in "each generation" to "become themselves incorporated into the tradition."240

N. R. Hanson also develops views very similar to Kuhn and Toulmin's. While it should be apparent that the interconnection between observer and observed, so much a part of quantum mechanics and relativity, marks a paradigm switch which fosters the development of these historicist views, Hanson points to this connection more emphatically than either Kuhn or Toulmin. Indeed, Hanson advises the reader of his now influential Patterns of Discovery
that everything in the book aims toward the explanation of "elementary particle physics" in the last chapter. Moreover, Hanson's presentation often seems clearer than Kuhn or Toulmin's; and his version may be the more radical of the three.

Hanson too has added a term to the philosophy of science; he has argued that observation is a "theory-laden" undertaking. He begins by asking if Kepler, who regarded the sun as fixed, and Tycho, who regarded the earth as fixed, "see the same thing in the east at dawn?" To answer this question Hanson first shows that "seeing in an experience" and not a mere "retinal reaction" or "photochemical excitation." Often lured to try his hand at turning a clever phrase (sometimes he just misses), Hanson asserts that "there is more to seeing than meets the eyeball," that "people, not their eyes, see." Having established that seeing always involves some sort of mental register, Hanson then asks if it makes sense to say that Tycho and Kepler saw the same thing and then interpreted it differently. Here, actually, is the key to Hanson's theory, for he argues that interpretation of an object and the existence of the object as seen are intimate. To prove his thesis he presents numerous Gestalt drawings, all of which can be viewed in at least two ways, with foreground and background interchanging depending upon what is seen. He thus concludes that one does not first see and then interpret but that one sees as one interprets:

One is tempted to say 'the construing is the seeing.' The thread and its arrangement is
Thus, according to Hanson's definitions, "Tycho and Simplicius see a mobile sun, Kepler and Galileo see a static sun." It is here that one can discern the relationship between Hanson's thesis and the uncertainty and complementarity principles as they were explored in the first section of this chapter. There it was argued that the view which attributes some objective state to a particle which is then disturbed by observation was an error. Rather, what actually is changes depending upon its observation.

From his conclusion that seeing is always a "seeing as . . . ," Hanson moves on to suggest that what is seen depends upon the theoretic patterns that one is capable of entertaining. As he puts it in a Hansonian witticism: "Gold is rarely discovered by one who has not got the lay of the land." Or more formally: "Observation of $X$ is shaped by prior knowledge of $X$." Asking what element there is in scientific seeing that accounts for this presuppositional epistemic control, he is lead to conclude that it is language. That is, "scientific knowledge . . . is primarily linguistic"; seeing is almost "an amalgam of the two—pictures and language."

Our visual sensations may be 'set' by language forms; how else could they be appreciated in terms of what we know? Until they are so appreciated they do not constitute observation: they are more like the buzzing confusion of fainting or the vacant vista of aimless staring through a railway window. Knowledge of the world is not a montage of sticks, stones, colour patches and noises, but a system of propositions.
However, if seeing is language constrained, there is also a good bit of difference between "picturing and asserting," and Hanson takes great care (apparently following the later Wittgenstein and rejecting the earlier picture theory of meaning) to draw the distinction.

Language, Hanson recognizes, is far more versatile than any picture theory of linguistics will allow.

Pictures and recordings stand for things by possessing certain properties of the original itself. Images, reflections, pictures and maps duplicate the spatial properties of what they image, reflect, picture or map; gramophone recordings duplicate audio-temporal properties. Sentences are not like this. They do not stand for things in virtue of possessing properties of the original; they do not stand for anything.\textsuperscript{252}

In other words, Hanson is pointing to the arbitrary relationship of the sign. He suggests that language, of all forms of communication, "copies least of all."\textsuperscript{253}

There are exceptional words like 'buzz,' 'tinkle' and 'toot', but they only demonstrate how conventional our languages and notations are. Nothing about 'bear' looks like a bear; nothing in the sound of 'bear' resembles a growl.\textsuperscript{254}

Thus, language does not operate by 'representation' but by "referring." Hanson's line of reasoning is now pretty much complete: He has shown first that seeing and interpreting amount to the same thing. Second, he has argued that seeing is always a "seeing that . . . ," implying a linguistic element. Third, by pointing to the arbitrary nature of language he has shown that language is not a copying of things. From these points he can then conclude that
observation is not based upon pure sense data but is conceptually pre-formulated and that this pre-formulation is language-dependent and thus open to variance since the relation of a word to a referent is not necessarily given.

This means that "people using different languages might have difficulty in apprehending the same facts." Hanson gives, as an hypothetical example, the results which would ensue in a scientific language where adjectives were verbs.

Try 'the sun rounds', 'St John's hall rectangulates', 'sugar cubes.' Activity is suggested here. Would one who saw the round sun see the sun rounding? The college hall is rectangular. Would this fact be apprehended by a man for whom the hall rectangulates . . . ? Perhaps the man for whom the sun rounds would see the sun incessantly arranging itself as a sphere. If he can say only 'The sun rounds', how else can he see it?

Hanson is here recognizing that what is labeled as fact is not separable from the language employed in the labeling. "If a distinction cannot be made in language," he writes, "it cannot be made conceptually." Moreover, since physics is "a mountain of mathematical formalisms," this "'locking' of concept and language is fundamental in all physics." But if facts and observations are language-dependent, this does not mean "thinking new thoughts" is impossible, for if facts are "molded" by language the meaning of terms is also context dependent. In other words, theories, terms, and formulae have a range of meanings depending on the context in which they are used. "Questions about the nature of causation," for example, "are to a surprising degree questions about how certain
descriptive expressions, in definite contexts, coupled together, complement and interlock with a pattern of other expressions.\textsuperscript{261} Hence, the encountering of a phenomenon which does not seem to fit the previously held explanatory patterns arises from the possibilities of those patterns themselves, but further fruitful explanations come about, at least partially, by drawing together new contexts which in turn change the meanings of the constituent terms and thus the nature of the theory-laden stance in any observation.

Therefore, Hanson argues that "interpretation is not something a physicist works into a ready-made deductive system: it is operative in the very making of the system."\textsuperscript{262} The "making of the system," the generation of explanatory theories, always involves a dialectical movement from whole (theoretical gestalt) to parts (data) and vice versa. On the one hand,

The critical moment comes when the physicist perceives that one might reason about the data in such and such a way. One might explain this welter of phenomena $\mathbb{P}$, throw it all into an intelligible pattern, by supposing $\mathbb{H}$ to obtain.\textsuperscript{263}

But on the other hand,

physical theories provide patterns within which data appear intelligible. They constitute a 'conceptual Gestalt.' A theory is not pieced together from observed phenomena; it is rather what makes it possible to observe phenomena as being of a certain sort, and as related to other phenomena.\textsuperscript{264}

Borrowing from Peirce, Hanson thus rejects both the view that induction accounts for the rise of a theory and the view which asserts that scientists start with a theory and then test it.
There is something wrong with the older view [induction]: it is false. Physicists rarely find laws by enumerating and summarizing observables. There is also something wrong with the H-D account [hypothetico-deductive], however. If it were construed as an account of physical practice it would be misleading. Physicists do not start from hypotheses; they start from data.\textsuperscript{265}

Facts, being theory-laden, are determined by theory, but theories, in turn, are determined by facts. Moreover, the linguistic dimension is "relevant" to this circular process.\textsuperscript{266} It is the scientific tradition, largely determined by its linguistic constructs, which gives rise to the conceptual patterns that allow certain phenomena to appear and be explained. But these constructs are never completely closed for they allow phenomena to appear which do not quite fit the determinate conceptual patterns. This calls for the arrangement of new contexts and new meaning possibilities. The symbolic formulations are never satisfactory enough to explain all particular phenomena nor are they adequate enough to encapsulate the general "truths" which allow phenomena to arise in the first place. There must always be a shifting back and forth, from parts to whole, from whole to parts. Arising from a tentatively fixed conceptual and linguistic framework, there is always the need for continual change, for the renewal of interpretive possibilities.

The views of Kuhn, Toulmin, and Hanson, similar in many ways, all reject a philosophy which sees science as a closed system where facts are accumulated one by one. They see science as a dynamic activity where creative development can occur precisely because of
the finite limitations which exist at any one time. Their views are similar to the hermeneutical phenomenology of Heidegger and Gadamer. The circular nature inherent in the generation of theories is akin to the hermeneutic circle where parts and whole interrelate in a mutually dependent context. The emphasis on tradition, on the formative influence which the past has on the present—on the creative possibilities of repeating the past in the present in order to renew a tradition and project a future—this suggests a similarity to the hermeneutic ontology of Heidegger. The impossibility of a presuppositionless stance and the emphasis upon the generative powers of language, both in forming a tradition and in allowing for its renewal, also suggest a parallel with the newer text or language-based hermeneutics which replaced the more romantic author-centered hermeneutics of the nineteenth century.

Of all the commentators on phenomenology Theordore Kisiel is one of the few writers (perhaps the only writer) who has seen this similarity. He asserts that the "basic theses of the new philosophy of science . . . strike resonant chords with the phenomenological tradition, particularly with the hermeneutical phenomenology of Heidegger and Gadamer." Kisiel further suggests that "among the new philosophers of science" it is Michael Polanyi who "has been the most sensitive to the ultimate ontological character of scientific discovery" and who comes closest to the Heideggerian view. Kisiel, however, tends to de-emphasize the importance which language plays in Polanyi's philosophy and instead to emphasize Polanyi's
concern with the role of the body in scientific discovery. To be sure, Polanyi does present a philosophy where the body, allowing man to "dwell in" the world, is important, but Kiesel's rendition is somewhat misleading, for language is extremely important to Polanyi. In several ways, in fact, it is Polanyi who pulls together the three "dimensions" of science—ontological, imaginative, historical—that it has been the goal of this chapter to explore.

Polanyi is adamantly opposed to the separation of subject and object. The title of his most well-known work, Personal Knowledge, attests to his desire to include the "personal participation of the knower in all acts of understanding." Polanyi start[s] by rejecting the ideal of scientific detachment. In the exact sciences, this false ideal is perhaps harmless, for it is in fact disregarded there by scientists. But . . . it exercises a destructive influence in biology, psychology and sociology, and falsifies our whole outlook far beyond the domain of science.

Wishing to test the objective ideal which has dominated views of truth for three hundred years, Polanyi examines scientific discovery to see if indeed it is based on this ideal of objective order. He finds the view wanting. In fact, his purpose "is to show that complete objectivity as usually attributed to the exact sciences is a delusion . . . ." In its place, Polanyi suggests that there is always a "tacit dimension" to all discovery and knowledge. The scientist is part of a scientific community and because he has a passionate and personal commitment to scientific pursuit, he submits himself to learning the "unspecifiable art of scientific research."
which is revered in the traditions of that community.

By watching the master and emulating his efforts in the presence of his example, the apprentice unconsciously picks up the rules of the art, including those which are not explicitly known to the master himself. These hidden rules can be assimilated only by a person who surrenders himself to that extent uncritically to the imitation of another. A society which wants to preserve a fund of personal knowledge must submit to tradition. 273

These "hidden rules" are not given to determinate articulation. They provide what Polanyi calls the "subsidiary awareness" which stands behind all "formal awareness." They allow certain problems to become available and push others to the background, affording a continual contact with a reality which in its totality remains hidden. 274

Polanyi, like Heidegger, focuses on the use of tools to explain what he means by the "tacit dimension." "When we use a hammer to drive a nail," he writes, "we attend to both nail and hammer, but in a different way." 275 The focus of attention is the nail; it is an object. The hammer, on the other hand, is an "instrument" which is not "watched" in itself:

we watch something else while keeping intensely aware of such instruments. I have a subsidiary awareness of the feeling in the palm of my hand which is merged into my focal awareness of my driving in the nail. 276

Science, like all studies, has as its level of "subsidiary awareness" the "transmission of skills and connoisseurship from master to apprentice" which forms the "very heart" of scientific knowledge and allows for the continuity of tradition. 277 These skills, methods, and approaches become for the scientist the "pre-suppositions" which
he accepts "by dwelling in them."

When we accept a certain set of pre-suppositions and use them as our interpretative framework, we may be said to dwell in them as we do in our own body. Their uncritical acceptance for the time being consists in a process of assimilation by which we identify ourselves with them.\textsuperscript{278}

Notice that scientists "may be said to dwell in them as [they] do in [their] own body." The extent to which Polanyi wishes to be taken literally about the bodily component in scientific knowledge is more problematic than Kisiel allows. By contrast, Polanyi is quite definite when he says scientists "assimilate most of these pre-suppositions by learning to speak of things in a certain language . . . ."\textsuperscript{279}

In any case, Polanyi rejects the objective ideal in science by asserting that all knowledge is dependent upon the interaction of subject and object. This, however, is far from a subjectivist's vision. There is a reality which pulls the scientist to discovery, but the "kind of order which the discoverer claims to see in nature goes far beyond his understanding . . . ."\textsuperscript{280} It is here that science allows for the imaginative realm.

\ldots true discovery is not a strictly logical performance, and accordingly, we may describe the obstacle to be overcome in solving a problem as a 'logical gap', and speak of the width of the logical gap as the measure of the ingenuity required for solving the problem. 'Illumination' is then the leap by which the logical gap is crossed. It is the plunge by which we gain a foothold at another shore of reality.\textsuperscript{281}

The work of a scientist is creative when "it changes the world as we see it, by deepening our understanding of it."\textsuperscript{282} The imaginative
mind is always ready to break out of the normal conceptual patterns, to use its "anticipatory powers" as a guide to new discovery. When this occurs, the discovered truth is inseparable from its aesthetic power. "The affirmation of a great scientific theory," as Polanyi puts it, "is in part an expression of delight. The theory has an inarticulate component acclaiming its beauty, and this is essential to the belief that the theory is true." Thus there is a merging of the imaginative and ontological realms.

Just as important as the imaginative leap to an understanding of some new feature of reality, however, is the accompanying recognition that the discovery is "formed by the indeterminate range of anticipations expressed in describing something." For Polanyi the very "contact with reality" always involves the "capacity of formal speculations to raise new problems and lead on to new discoveries." Reality is not something which can be boxed and set aside. There is always a dynamic interplay between the foundations of science which the individual inherits and learns, the imaginative possibilities of the creative mind, and a discovered reality which opens possibilities for future generations. It is this coalition which pulls the past into the future and creates a living tradition.

And here language is extremely important. Words, for Polanyi, are not merely "conventions, established for the sake of convenient communication." They are this but much more besides. They form a wealth of indeterminate potentialities for meaning. It is clear, as seen above, that the value of a scientific theory is the range of
meanings which can be discerned in it by future generations which
take up the past and re-formulate it in the present. It is language
which allows for this possibility.

. . . the educated mind relies for most of its
knowledge on verbal clues. It follows, then, that
its conceptual framework will be developed mostly
by listening or speaking, and this conceptual de-
cision will usually entail also a decision to under-
stand or use words in a novel fashion. In any case,
every use of language to describe experience in a
changing world applies language to a somewhat un-
precedented instance of its subject matter, and
thus somewhat modifies both the meaning of language
and the structure of our conceptual framework.288

The use of a "fixed interpretive framework" is the "impersonal" use
of language "according to strict rules."289 But there is another use
of language which "relies on a personal intervention of the speaker"
and changes "the rules of language to fit occasions."290 It is a
"heuristic act," found "in the originality of poetic phrasing or
of new mathematical notations covering new conceptions."291

This is the sense in which . . . denotation [is] and
art. To learn a language or to modify its meaning
is a tacit, irreversible, heuristic feat; it is a
transformation of our intellectual life, originating
in our own desire for greater clarity and coherence,
and yet sustained by the hope of coming by it into
closer touch with reality.292

Thus, in science there is a need for a constant "re-interpretation
of language."293 Polanyi presents numerous examples, from Kepler
to Newton to Dalton to Einstein, of how symbolic formulations of the
past gained new and unexpected value through re-interpretating the
richness of their indeterminate meanings. Here Polanyi is quite
clear:
We know also that mathematical conceptions often disclose their deeper significance only to later generations, by revealing yet unsuspected implications or undergoing a surprising generalization. Moreover, a mathematical formalism may be operated in ever new, uncovenanted ways, and force on our hesitant minds the expression of a novel conception. 294

It is thus language that forms the pre-suppositions of the scientific community in which the scientist "dwellss" and which allow for the interaction of subject and object in scientific discovery; it is language, because of its range of indeterminate meanings, which allows for the imaginative leap to new insights; and it is language which binds a tradition together and, at the same time, beckons for continual reinterpretation and allows for change.

-iv-

Conclusion

This picture of science is not of an ossifying discipline which relegates man to a performance of the systematicities he inherits. In the twentieth century there has developed a growing dissatisfaction with the positivist program; this dissatisfaction, similar in many ways to the disapprobation of the New Critics, has arisen within the scientific community itself. While logical positivism or empiricism is not dead (Earnest Nagel still leads the crusade), there is clearly a growing movement away from objectification, pure referential meaning, and empirically verifiable truth. The theorists reviewed here are anxious to show that science attests to the creative
potential of man to make and discover the world. This is a far more sophisticated view of science, seeing truth always in a benevolent tension between extensional and intensional meaning, between correspondence and coherence, between closed systems and open contextual possibilities, between subject and object, between past and future, between systems and discoveries, between certainty and the ambiguities of language.

There is more called for here, however, than merely justifying science to those who would misguidedly attack it. The problems which the theorist of science tackles are parallel to those tackled by theorists of literature. Central to both are the problematics of language. It has become increasingly apparent to philosophers of science that language is not a ready-made container which, with sterile handling, can encapsulate the truths of the world. Instead, it shapes the world in the very act of discovery. In science, we well as literature, there is always that "penumbra of uncertainty" demanding contextual interplay and pointing to the need for aesthetic fulfillment. It is a mistake then to define literature as radically different from science. Rather, they should be seen as colleagues grappling with similar problems—with tradition, interpretation, discovery and, above all, language and meaning.

One can go even further. Certainly, literature and science are different, but the differences seem more ones of degree than kind. More importantly, the lessons which modern science teach may have significant ramifications for the major issues in contemporary literary theory. In analyzing some of these issues in the next
chapter it will be helpful to keep these lessons in mind. First, in interpretation it is impossible to keep subject and object distinct. In fact, the notion of objective interpretation is an unhappy illusion. Quantum mechanics and relativity have pointed to the inseparability of observer and observed, and the recent philosophies of science have shown that it is impossible to assume a presuppositionless stance toward the world. This latter point implies, secondly, that one must approach the interpretation of the world with certain provisionally closed systems of meaning. Conversely, the generation of meaning is always dependent upon these closed systems. Nevertheless, no symbolic system is ever finally closed. It is always open to a range of indeterminate applications. Third, it is the very impossibility of arriving at absolute truth which gives rise to creative activity. The search for final systems of total symbolic coherence is always only partially accomplished, for both language and the world cannot be finalized. This, however, is the condition for hope, not despair. It gives rise to the unlimited potentiality for meaning and allows the individual to both "dwell" within a tradition and to revitalize the tradition to which he belongs.
END NOTES


6. Ibid., p. 32.

7. Ibid., p. 39.

8. Ibid.

9. Ibid., p. 38.


11. Ibid., p. 178.


16. Ibid.

17. Ibid.

19 Zukav, *The Dancing Wu Li Masters*, p. 172.


38 *Ibid.*, p. 44


41 Gamow, p. 229.

42 Born, p. 45.


46 Niels Bohr, quoted in Zukav, *The Dancing Wu Li Masters*, p. 118.

47 Zukav, p. 115.

48 Gamow, p. 257.

49

50 Gamow, p. 258.

51 Niels Bohr, quoted in Zukav, *The Dancing Wu Li Masters*, p. 135.


54 Ibid., p. 102.


57 von Weizsäcker, p. 103.

58 Ibid., p. 103.

59 Heisenberg, Physics and Philosophy, p. 58.

60 Ibid., p. 41.


62 Ibid., p. 151.

63 Heisenberg, quoted in Patrick Heelan, Quantum Mechanics and Objectivity, p. 151.

64 Heisenberg, Physics and Philosophy, p. 144.

65 von Weizsäcker, p. 129.


67 Ibid., p. 218.


69 Bohr, reported by J. Bub in The Structure of Scientific Theories, p. 404.

70 Jeffrey Bub, in The Structure of Scientific Theories, p. 405.


88 von Weizsäcker, p. 114.


Ibid., p. 170


Bohm, p. 390.

Ibid., p. 374.

Ibid., p. 376.

Ibid., p. 388.

Ibid., p. 391.

Ibid., p. 389.

Bronowski makes this parallel. See *A Sense of the Future*.


Ibid., p. 66.

Nagel and Newman, p. 228.

Ibid.


110 Ibid.

111 Ibid., p. 268.


113 Ibid., p. 149.

114 Ibid., p. 148.

115 Lucas, "Minds, Machines and Gödel," p. 271

116 Ibid.


118 Ibid.

119 Ibid.

120 Ibid., p. 270.

121 Ibid., p. 278.

122 Ibid., p. 269.

123 Ibid., p. 71.

124 Ibid., p. 261.

125 Ibid.
126 Ibid., p. 42.
127 Ibid., p. 46.
128 Ibid., p. 47.
129 Ibid., p. 192.
130 Ibid., p. 228.
131 Ibid., p. 229.
132 Ibid.
134 Ibid., p. 80.
135 Ibid.
136 Ibid.
137 Ibid., p. 103.
138 Ibid., p. 87.
139 Ibid., p. 86.
141 Ibid., p. 88.
142 Ibid.
143 Ibid., p. 99.
144 Ibid.
145 Ibid.
146 Ibid., p. 98.


148 Ibid.

149 Ibid.

150 Ibid.


152 Bronowski, The Common Sense of Science (Cambridge, Mass., 1967),

153 Ibid.

154 Ibid.

155 Ibid., p. 138.

156 Ibid., p. 140.

157 Ibid., p. 138.

158 Bronowski, The Visionary Eye, p. 31.


161 Ibid., p. 62.

162 Ibid.

163 Ibid.

See Bronowski, "Human and Animal Language."

Ibid., p. 120.

Ibid.

Ibid., p. 118.

Ibid., p. 119.

Ibid.


Bronowski, The Logic of Experiment," p. 47.

Ibid., p. 50.

Bronowski, "The Logic of the Mind," p. 71

Ibid., p. 64.

Ibid., p. 73.

Ibid.

Ibid., p. 72.

Ibid., p. 69.

Bronowski, "Human and Animal Languages," p. 130.

Ibid.

Ibid., p. 131
184 Ibid.

185 Ibid.

186 Bronowski, *The Identity of Man*.


188 Popper, *Conjectures and Refutations*, p. 129.

189 Ibid.

190 Popper, *Conjectures and Refutations*, p. 129.

191 Ibid.


193 Ibid.


195 Ibid., p. 46.

196 Frederick Suppe, "The Search for Philosophic Understanding of Scientific Theories," in *The Structure of Scientific Theories*, p. 120.


198 Ibid., p. 37.

199 Ibid., p. 18.

200 Ibid., p. 134.

201 Ibid., p. 42.
202 Ibid., p. 148.

203 Ibid.

204 Ibid., p. 108.

205 Ibid., p. 109,

206 Ibid., p. 110.

207 Ibid.

208 Ibid., p. 118.

209 Ibid., p. 125.

210 Ibid.

211 Ibid.

212 Ibid.


214 Ibid., p. 509.

215 Ibid.

216 Kuhn, The Structure of Scientific Revolutions, p. 141.


218 Ibid., p. 505.

219 Ibid., p. 464.

220 Suppe, response to Kuhn's "Second Thought on Paradigms," in The Structure of Scientific Theories, p. 496.
221 Ibid., p. 497.

222 Ibid.


224 Ibid., p. 506.

225 Ibid., p. 480.

226 Ibid.

227 Ibid., p. 469.

228 Ibid., p. 506.


230 Ibid., p. 57.

231 Ibid.


234 Ibid.

235 Ibid., p. 146.

236 Toulmin, Foresight and Understanding, p. 104.

237 Toulmin, Foresight and Understanding, p. 110.

238 Ibid., p. 101.

239 Ibid., p. 104.
240 Ibid., p. 110.


242 Ibid., p. 19 and elsewhere.

243 Ibid., p. 5.

244 Ibid., p. 6.

245 Ibid., pp. 6-7.

246 Ibid., p. 23.

247 Ibid., p. 17.

248 Ibid., p. 19.

249 Ibid.

250 Ibid., p. 25.


252 Ibid., p. 27.

253 Ibid., p. 28.

254 Ibid.

255 Ibid., p. 34.

256 Ibid.

257 Ibid.

258 Ibid., p. 47.

259 Ibid., p. 35.
Ibid., p. 46.

Ibid., p. 62.

Ibid., p. 72.

Ibid., p. 88.

Hanson, Patterns of Discovery, p. 90.

Ibid., p. 70.

Ibid., p. 86.


Ibid., p. 269.

Michael Polany, Personal Knowledge (Chicago, 1958), p. vii-

Ibid.

Ibid., p. 18.

Ibid., p. 53.

Ibid.

Ibid., pp. 49–65.

Ibid., p. 55.

Ibid.

Ibid.

Ibid., p. 60.

Ibid., p. 59.
280 Ibid., p. 64.
281 Ibid., p. 123.
282 Ibid., p. 143.
283 Ibid., p. 124.
284 Ibid., p. 133.
286 Ibid.
287 Ibid., p. 113.
288 Ibid., p. 104.
289 Ibid., p. 105.
290 Polany, Personal Knowledge, p. 105.
291 Ibid.
292 Ibid., p. 106.
293 Ibid., p. 104.
294 Ibid.
CHAPTER FOUR: SCIENCE, POETRY, FREE PLAY

Just as there is a negative theology, there is a negative atheology. An accomplice of the former, it still pronounces the absence of center, when it is play that should be affirmed. But is not the desire for a center, as a function of play itself, the indestructible itself? And in the repetition or return of play, how could the phantom of the center not call to us?

--Jacques Derrida

-i-

The Question of Authority

The most controversial issue in contemporary literary polemics is the question of authority. There is, of course, always vying for academic influence and power. Here the question of authority is the question of hegemony, and the above title means to encompass this element. If, in Chapter Two, it was observed that what Gerald Graff called the New Critics' "persistent condemnations" "couched in vituperative language" are clues to a real "fear and trembling" before the power of science, the same may be said about Graff's recent vituperations against the so-called Yale school of criticism. If twenty years ago the major threat to legitimizing literary studies was perceived as arising from outside the ranks of the English Department, the major threat today is perceived by some as taking the form of a mutiny within those very ranks. As "outside" influences, particularly from linguistics, anthropology, and philosophy,
begin to find a home "inside" the discipline of literary studies, the distinction between inside and outside (in a very Derridean way) has tended to collapse, leaving a great many teachers and theorists troubled by their centerless discipline. Internecine warfare is rampant, consequently, with the epithetical ambush being the favorite tactic. The battle lines even have a sort of loose "geo-academic" quality as those on the eastern seaboard, inverting their traditional role as vested conservatives to become the avant garde, hurl labels across the Great Divide, while those on the west coast, now the preservers of tradition, launch counterattacks, with the rest of the country caught in the crossfire. Thus, Stanley Fish, often identified with the avant garde (probably, one might mention, more because of his dazzling rhetorical flights than any sort of Derridean perspective), unceremoniously refers to the University of California at Irvine as "Camp Krieger"; Frank Lentricchia, following William Pritchard's labeling of the Yale critics as the "Hermeneutical Mafia," "fingers" Paul de Man as the "capo di tutti capi" while Wayne Booth, at the University of Chicago, calls for a ceasefire and a peaceful coexistence afforded by a literary pluralism.

The real question of authority, although not unrelated to these academic battles, is, however, not the one of institutional supremacy. As always, it is a question of interpretive authority and whether the guiding principle for hermeneutics should focus on the author, the text, or the reader. If this has always been a central issue of literary theory, one could nevertheless say (with one eye on Paul
de Man) that this always important aspect of criticism has reached crisis proportions today.\footnote{5} The reason for the crisis-like nature of this question is, of course, impossible to fix. If one were to choose a watershed date, it would probably be 1966 when Derrida delivered his "Structure, Sign, Play" paper at the Johns Hopkins symposium.\footnote{6} It was soon clear that something new was in the air, and literary theory was awakened from a somewhat somnambulant grappling with phenomenological criticism to discover that something called post-structuralism had arrived almost in advance of the structuralism it challenged. Things started happening rather fast. Classificatory systems seemed almost impossible to apply and if theorists in this country were having difficulty getting their bearings it was doubly maddening to be told that the attempt to maintain directions and systems from any fixed center was misguided anyhow. It is probably not too inaccurate to say that a great many theorists in the United States were somewhat embarrassed at having to scurry in an attempt to catch up to an understanding of the continental influences which were apparently exerting so much power. A certain feeling of vulnerability was inevitable.

The question of authority became the central issue when the Derridean attack on the center was legitimized in the debates in \textit{Critical Inquiry} between J. Hillis Miller, M. H. Abrams, \textit{et al}.\footnote{7} Walter Ben Michaels is undoubtedly correct when he points out that American critics reacted principally to what they took to be the "implicit subjectivism" of deconstructive theory.\footnote{8} This is clearly
the concern of Abrams. The problem which faced the more traditional critic was what to do with a theory which espoused an apparently unbridled indeterminancy. So, once again, the relationship between determinate and indeterminate meaning became the focus of debate, except that now those theorists who followed (even if somewhat wanderingly) the New Critical path which legitimatized literature by placing it in opposition to a deterministic science found themselves in the uncomfortable position of having to argue for determinate meaning in literature. This description, as a generalization, is, of course, overly simplistic as there are numerous nuances of differences between the members which identify with either side of this debate. Indeed, some of these differences will be examined below to show that the situation is quite complex; nevertheless, if one can divide theorists into two camps (one has only to note Hayden White's distinction between "Absurdist" and "Normal" critics or J. Hillis Miller's "canny" and "uncanny" critics to discover how popular is the move), it is on the question of determinancy that the division is to be made. Hopefully, this serves to substantiate the point labored in Chapter Two that in the literary theorists' attacks upon the tenets of a positivistic science there is typically more of an acceptance of those tenets than is commonly supposed.

The defenses against the decentering "movement" of Derrida take different forms, but all try to find a purposeful act in literary interpretation. One such response centers meaning in the author.
This approach ranges from the phenomenological and synthesizing view of Georges Poulet to the phenomenological and analytic view of E. D. Hirsch, Jr. In one sense it may be unfair to suggest that for Poulet the author provides the pivotal element around which the text and the reader revolve since it is part of his thesis that the consciousness of the reader and that of the author merge through, or more accurately in, the text. For Poulet, the "work lives its own life within" the reader\textsuperscript{12} and the "subject which presides over the work can exist only in the work."\textsuperscript{13}

In short, since everything has become part of my [the reader's] mind, thanks to the intervention of language, the opposition between the subject and its objects has been considerably attenuated. And thus the greatest advantage of literature is that I am persuaded by it that I am freed from my usual sense of incompatibility between my consciousness and its objects.\textsuperscript{14}

If one approaches Poulet's theory without jettisoning the subject-object dichotomy, it is clearly the author who is in control. Although jettisoning that dichotomy results in accepting the phenomenological ego of the author (rather than the psychic or biographical ego) as it inheres in the work actualized by the reader, the distinction is not always easy to maintain even for Poulet: "As [the author] makes us read [the work], he awakens in us the analogue of what he thought or felt. To understand a literary work, then, is to let the individual who wrote it reveal himself to us in us."\textsuperscript{15} In other words, it is difficult in Poulet's theory to maintain the "coincidence" of reader and writer without giving the author the
hierarchical position. When J. Hillis Miller, for example, was at the cusp of his interest in Poulet, he illustrated the tendency to venerate the "crystalline sphere" of the author rather nicely. Explaining Poulet's theory, on the one hand, he writes, "the plunge into a book is achieved only in the perfect coincidence of the reader's mind with the 'intimate indescribable' of the author's mind"; on the other hand, "the re-creation of the mind of the author in the mind of the critic is not performed for the sake of any selfish good it may do the critic, but entirely for the sake of the author criticized."

For E. D. Hirsch, Jr. who, as Frank Lentricchia notes, seems to provide the unspoken theoretic grounding for Abrams' rebuttal to Miller, the importance of authorial centering is much simpler and more openly admitted. It is to Hirsch's credit that he has been one of the few theorists to express overtly his allegiance to "scientific" principles. He testifies to this allegiance with admirable candor in his recent The Aims of Interpretation:

Literary study is at present the most skeptical and decadent branch of humanistic study, for a number of causes, among which an important one is its anxiety-ridden insistence, more emphatic than in any other field, on distinguishing itself from natural science. If poetry is the antipodes to science, then knowledge of poetry must be the antipodes to scientific knowledge; so runs the nonsequitur. Humanistic knowledge is different from the kind of knowledge sought in the "hard" sciences, or the "exact" sciences. Unlike these, the humanities are soft and inexact, virtues which bring them closer to "life." The humanities seek a knowledge that is not neutral like that of science, but infused with value. But such contrasts are, bluntly, false.
It is, of course, also the thesis of this dissertation that literary and scientific studies have much in common, but Hirsch does great damage to the possibility for their reunion. To be as straightforward as Hirsch, one must also be blunt: Hirsch's conception of the scientific model is overly simplified. It is unfortunate that he is able to toss out a few sentences about scientific method with the confidence that they will be accepted as accurate descriptions of what is, in fact, a much more complex theoretical activity than Hirsch can allow. Here is Hirsch's description of science and truth:

The progress of knowledge and its consolidation are governed by the critical testing of hypotheses with reference to evidence and logic. If we look at any field of inquiry, we discover that it can be described as a congeries of hypotheses, some of them well accepted and others in rivalry with alternative hypotheses. We also discover a large body of evidence relevant to those hypotheses and potentially relevant to others not yet conceived. Under this conception, all inquiry is a process directed toward increasing the probability of learning the truth. This probability is, of course, increased whenever supportive evidence is increased. On the other hand, when hypotheses are called into doubt by the discovery of unfavorable evidence, then some adjustment is made, or some rival hypothesis accepted, or the whole issue is thrown into doubt.  

Such an unproblematic view of the relationship between hypothesis and verification has been seriously questioned in Chapter Two. It is not that Hirsch's view is "invalid"; indeed, in his dedication to "logical integrity" Hirsch's mind operates with a real logical rigor. The problem is that Hirsch's view is rather limited. It is not enough to say that the discovery of truth is the legitimate goal. The real question is what one means by that statement.
Hirsch's recognition of the communal nature of knowledge is really a slight-of-hand gesture for both scientific or literary theory. It is interesting (in this respect) to see how Hirsch brings up Kuhn's name only to dismiss it rather cursorily. His implication is that Kuhn is on some sort of lunatic fringe of the scientific community, that he is appreciated far more in those circles of zealous relativists who comprise the humanities. The similarities between Kuhn, Toulmin, Bronowski, Polanyi, Bohm, Feyerbrand, and Hanson seem to belie this. It is true that Popper comes closest to paralleling Hirsch's own theories and thus it is understandable why Hirsch invokes his name; Popper's theory of verisimilitude is quite similar to Hirsch's view of probability in validation. It was for this reason that in Chapter Three Popper was treated as a figure who bridged a nineteenth-century philosophy of science and some of the other challenging twentieth-century theories. (One can't help but wonder, in this connection, how Hirsch would deal with Bronowski's reading of Popper.) Popper, however, is not nearly as similar to Hirsch's view of science as he is made to appear. It is very important to Popper, for example, to show that a neutral observation language is not possible. In any case, if tampering with the omnipotent power of objective knowledge is anathema to Hirsch, he would be wise to examine more critically the teachings of twentieth-century physics before deciding to ally himself with the "exact" sciences.

To return to the question of authorial intention, the point is that Hirsch's view of authorial control over meaning is quite similar
to his conception of science. In *Validity in Interpretation* Hirsch uses what Robert R. Magliola calls a "misunderstanding" of Husserl to justify an objectivist's view of authorial meaning.\(^{21}\) If Hirsch does wrench the meaning of Husserl, as Magliola suggests, it really isn't very crucial (although given Hirsch's thesis it is a little ironic) for one suspects that most sympathizers of Hirsch's position don't pay much attention to the philosophical underpinnings in any case. For Hirsch a text has a determinate meaning which exists apart from any empirical interpretation. That meaning is established, for all time, by the encoding author, who, within his own culture horizons, transmits into the text his own pre-verbal intentions. The interpreter who seeks to approach validity is that reader who reproduces the original intention without contamination by what Hirsch calls "significance." That is, the reader is to reiterate the meaning of the text without concern for the value which that meaning may or may not have. The parallel with Hirsch's view of science is obvious; it is the realist's perspective. Meaning is a given. The author determines that given. Hence, the meaning of a text is determinate although, for practical reasons, one may only determine what that determinate meaning asymptotically. Hirsch's theory has the value of providing a workable scheme for answering the free play enthusiasts. For Hirsch and his followers (some of whom are apparently incognito) the question of authority is answered by the author.

In moving from those contemporary theorists who wish to privilege the author to those who wish to privilege the text, one en-
counters theories which are much more complicated than the New Critical doctrines from which they are outgrowths. As was observed in Chapter Two, those New Critical theories, with their emphasis on the autotelic text, are the paradigm examples of that approach which seeks to place the center of control in the unique language of poetic discourse. The codification of the "intentional" and "affective" fallacies, which, if by no other means than a process of exclusion, forced a hierarchical position to the printed words on the page, is much more difficult to maintain today. Thus, Murray Krieger, so often accused in his reverence for the text of being a "late-linger-ing, hold-out New Critic," 22 is "pleased with those reviewers of his recent Theory of Criticism "who would still count [him] among the living." 23 Krieger admits that if he has "always been self-conscious about his debts to the New Criticism" and has been "anxious to exercise a continuity with the tradition out of which it grew," 24 he is nevertheless "alive to the need to open doors outward from it." 25 He is anxious to rectify those false impressions of his theory which see it as nothing more than a buttress for the "ontological" status of the text.

I am charged with accepting this paradigm "by adhering manfully to a notion of absolute objectivity," treating the poem as a static object and placing it normatively (and without a trace of critical epistemology) before each critic, insisting "that the aim of the responsible critic is to recover the poem as it was before he imposed on it all the personal quirks and dead generalizations that comprise his critical apparatus." Thus, . . . I am, in effect, categorized--like the New Critics--as a naive epistemological realist, who grants an uncritical ontological status to the poem as absolute object. I suffer this placement despite my explicit
It would be simply foolish to ignore such protests from a theorist who has done as much as any other individual to encourage theoretical discussion, one who continues to ask the tough questions and to wrestle with new issues. It is too easy to forget that even Krieger's first book was far from a complete endorsement of New Critical theory. Rather, that first book raised crucial questions concerning the difficulty of maintaining a theory which seeks to see the poem as a unique object and at the same time tries to accommodate the desire that the poem should relate meaningfully to the reader and the world. Krieger has been grappling with that dualism, or some version of it, ever since.

Still, one can't help but sense what Krieger wants to accomplish. He is unable to relinquish a quest, a quite heroic quest, which can arrive at a theory which justifies his sense of "our most elite works," which "earns our sense of their privileged status." Can one not say that Krieger, who has often shown a fondness for religious metaphors to explain his sense of poetic presence, offers both his practical and theoretic criticism as a spiritual testimony to the value of a living tradition? Searching for a way to explain his sense of the "miraculous" word made flesh, does he not offer to "witness" to the value of poetic language? It is here, in refusing to simply bracket "value" from "meaning" as does Hirsch, that
Krieger's worth as well as his difficulties arise. Occasionally he is quite straight-forward about his motivation:

Yet probably behind my theory and what I claim to be its empirical sanction is an anxiety--finally, I suppose, a moral anxiety--to keep active within our tradition the capacity to read the major works within our corpus lest we lose what man at his most creative is able to do with language for other men--lest, that is, we lose our sense of all that language can mean and do.28

There is in Krieger a deep-seated commitment to tradition, to the canon of great works and their educational value.

Such religious overtones and such respect for tradition can hardly help one from being reminded of Matthew Arnold. And indeed, the similarity points to one of the elements in Krieger's theory which complicates it and distances it from the purer ontological criticism of the New Critics. It is well to keep in mind that the major enemy to poetry in The New Apologists for Poetry was science (see Chapter Two). Given that fact, it is interesting to see how that antithesis itself challenges Krieger when the New Critical methodology comes under attack from phenomenology in the late 1960's. In a paper delivered in 1968 Krieger describes the "visionary critics" rejection of New Criticism for flirting with scientism:

The living body of the poems it [New Criticism] dealt with was made more and more into a corpse: a critic's role, no longer the humanistic one of renewing the vitality of our verbal heritage, was becoming the pseudo-scientific one of post-mortem, dissection become autopsy.

This attack on criticism as it is restricted to single works is an attack on the objective hopes and disinterested pretensions of the critical exercise. Under attack here is the detached critic--the critic as analyst and judge--the critic coolly operating a mediating (meddling) enterprise.
Distance between the critic and the work is to be destroyed as that which replaces human response with dehumanized analysis: distance creates the space for analysis and, consequently, the claim to a would-be scientific objectivity.  

Krieger endorses the desire for human communion which these "visionary critics" espouse, but he recognizes the need to stop short of the extreme views of someone like Ihab Hassan. Instead, he desires a theory which will "preserve the object as at once object and immediate."  

Despite all that contemporary personalism and existentialism have taught us about objectification (the making into things) as the murderer of the unique, I would want the critic to claim to have found in the abnormalities of poetic language the one way of having his object without surrendering the immediacy of its data.  

The "I would want" is telling. Krieger seeks a way to maintain the poem as valuable object without implicating the critic in the methodologizing scientism that he too has fought. The way which Krieger finds is worth quoting at some length because it foretells the very theory he puts forth in *Theory of Criticism*:

... the rational covert guide that threatens to undo the mask by revealing it as no more than mask undercuts the miracle of metaphor by proclaiming it not as equation but as miracle, with all the inspiration of awe—and of skepticism—which the notion of miracle engenders. It is no proposition; indeed, fact and proposition flatly deny it. It is but an imposition upon our vision, sanctioned only by the daring leaps sponsored by the delicate play of language. As no more (but no less) than miracle, it can be held only in the teeth of all rational denials. For it goes without saying that, if we can believe in it as a rational possibility, it is no miracle. By definition its very existence for us as miracle depends upon that part of us which knows it cannot happen—except in a way that passes understanding we cannot altogether yield up.
In suggesting that "all poems must covertly contain their anti-poems"\textsuperscript{33} Krieger goes beyond the New Critical notion that poems must have their own Mercutio. Here, the poem must "dissolve" its own miracle, "drag [itself] back to earth"\textsuperscript{34} by comforting the reader with the "assurance that it has been but a verbal game. . . ."\textsuperscript{35}

When Krieger comes to defend a poetics of presence against the Derridean inspired poetics of the "word's failure," it is exactly on this ground of the poem's simultaneous "presence and illusion." The parallel with Arnold is all too clear. The quotation below, which is Krieger's description of Arnold's retreat from science, is long but worth study.

Once exposed to the convincing verifiability of the knowledge of modern science, for all of the psychic comforts it precludes, man is no longer able to will his return to those wrongly supposed facts—source of his prior faith—which sustained the psychic unity needed by man to sustain him. However discomfited by the new facts that coldly put him in his cosmic place, man will not deny them or their consequences as they affect his psychic security. So Arnold is one with the positivists in conceding to laboratory-controlled science the sole access to truth. But he will not concede, as did the Huxleys, that the human psyche can live without the satisfactions, now forgone, that the now outmoded supposed facts had afforded. If, then, the need is constant and the supply cut off, some substitute way of supply that need must be found. Poetry is to be that way.

The special usefulness of poetry to perform this function stems from its power to unify our sensibilities without founding this power on supposed fact.\textsuperscript{36}

The full passage, covering about five pages, is not overly flattering to Arnold. One senses that Krieger feels Arnold conceded too much. It is, after all, to move beyond affective theories that Krieger is
headed. The point to be made, however, is that Krieger's description of Arnold's defense against science is most appropriate as a descriptive of Krieger's defense against Derrida. At the beginning of Chapter Seven of *Theory of Criticism* Krieger begins a "search" for a way to "bring fiction back to reality," but note the diminishing claims made at the end of the passage:

If we are to account for the constitutive role which the tradition has claimed for man's form-making power, those created forms, as alternative to empirical reality, must be justified on more than escapist grounds, as more than wish-fulfillment that turns from that reality. Instead, a way must be found for fiction to sustain reality, or at least to help us sustain it—or only bear it.  

And in "Literature and Écriture" Krieger, in battling what he sees as Derrida's "existential sense of absence" as well as the danger that *écriture* will swallow up literature, suggests a self-acknowledged identification with Arnold:

We may recall that Matthew Arnold's own concern to come to terms with the new unmetaphysical realities, while retaining a special role for poetry, led him to grant to poetry the psychological powers lost by religion along with our belief in its claims. If we share Arnold's loss of faith, we can go either of two ways: we can view poetry as a human triumph made out of our darkness, as the creation of verbal meaning in a blank universe to serve as a visionary substitute for a defunct religion; or we can—in our negation—extend our faithlessness, the blankness of our universe, to our poetry.

Krieger chooses the "first alternative" because he "want[s] to remain responsive to the promise of the filled and centered word." But he adds, in an Arnoldian move: "I am aware also that my demythologizing habit, as modern man, must make me wary of the grounds on which I
dare claim verbal presence and fulness."

There is no doubt that Krieger sees himself as "in retreat" (the phrase is Krieger's own) from post-structuralist attacks. The way in which Krieger was able to counter the arguments against the objective critic's potential deadening scientism was to hypothesize that the form of the poem, providing the critic with access and entry, freezes the temporal flow into a spatial form, but as a "reductive metaphor" that form turns on itself and annihilates its deadening mediacy. This is exactly the same tack that Krieger takes with the Derridean challenge except that here it is presence which must deny itself and turn into illusion. It leads Krieger, because of his commitment to the value of tradition and literature, very close to substituting an affective theory for an objective poetics.

There has also been in Krieger's theory a certain "mimetic" element as he sees poetry providing a unique medium, able to go beyond the veil of the universal, pierce through to the flux of a chaotic, existential reality, and yet return to the moral order while still remaining faithful to the visionary experience. In *A Window to Criticism*, Krieger cautions his reader against assuming that he is a naive metaphysician and tries to make a distinction, perhaps in a post-Kantian suggestion, between "apparent" and "ultimate" Manichaeism.

I should emphasize here, as I do in *The Tragic Vision* . . . , that there is really no metaphysical commitment to Manichaeism in the position. It derives from literary works and a critical method adequate to them, not from a philosophic analysis of the nature of reality. Inasmuch as it is concerned with fictions, which deal only with
the dramatic--the phenomenological--level of existence, this critical approach, in its persistent concern with tensions, can suggest no more than an apparent Manichaeism, a Manichaean face of reality. This suggestion would not speak at all to the ontological question about the ultimate nature of reality.\footnote{42}

Despite such disclaimers, however, one does get the sense, again and again in Krieger, that he values poetic discourse because it alone is able to reflect the paradoxical particulars of authentic reality without succumbing to the death-like fixity of universals. Frank Lentricchia's recent reading of Krieger seems, on the whole, convincing in this regard. Lentricchia suggests that for Krieger "the aesthetic mode of discourse alone is 'adequate to' the existential because the aesthetic alone can 'entangle' in its ironic labyrinth of verbal textures the existential level of our experience."\footnote{43} It is indeed clear that Krieger has a distrust of what he calls in The Classic Vision the "ethical man" who "always [sees] only the veil of universals that he has interposed for his rational comfort between himself and existential reality . . . ."\footnote{44} To quote Lentricchia again:

All of this is the talk of an ontologist who believes that what he sees is not a projection of his private psyche but is grounded in the nature of things "behind" the illusions of everyday life. That little preposition "behind," which Krieger uses so much, carries tremendous force in his writing, and in the writing of all realists.\footnote{45}

It is probably not too wrong to say that this distrust of succumbing to the veil is a habit of mind for Krieger. There is a certain Christian theological overtone to this element of his theory also. Unable to plunge into the whirl of Manichaean existence,
ordinary man is foreordained to retire to the anodyne of social universals. But if this is a sanity-securing move, it is somehow inauthentic and suggests the inevitableness of sin. The poet, however, is able to provide, if only momentarily, a cathartic vision which is miraculously faithful to the ironic and authentic mode. It is curious to see how Krieger's theoretic methodology itself is a reflection of the theory produced by that methodology. In "Theories about Theories about Theory of Criticism" Krieger describes his theoretic maneuvers:

So I have tried to outmaneuver anticipated contradictions (as I have tried to account for alien elements forced upon me by history and by my contemporaries) by including them within the terms of a paradoxical model. Somewhere in my argument I have anticipated most objections by trying to include them too within my paradoxical contours in advance—if one can accept my tactic just at the outer edge of what may be permitted to argument.  

In a lesser critic than Krieger one might be tempted to point up the contradictions with the confidence of a debater. Actually, however, to say that the methodology produces the theory (as above) is in itself unfair, for it is everywhere Krieger's desire to expound a poetics which is true to his poetic experience, and if that experience is one of concordia discors, it is obvious that the theory itself will be paradoxical. Still, at some point, one is tempted to respond to Krieger as theorist rather than to the theory itself.

In pointing to these "affective" and "mimetic" elements, however, one must not be blinded to the overall thrust of Krieger's theory. Krieger, himself, cringes before the prefix in the term "re-presentation"; everywhere it is his move to privilege the poem qua poem.
One can turn to any one of his books to find ample evidence of his goals. A few examples should suffice to illustrate the point:

A Window to Criticism:

In the fully incarnating metaphor . . . through the total dedication to and definition within the reduced and a fortiori aspect, unitive language is achieved for these forces. They are no longer left ungrown but develop into full symbols. The poetic context pushes them to their completion, which is to say to their extremity, finally transforming them by way of the miracle that produces the absolute equivalence of incarnation. . . .

The Classic Vision:

It is the critic's role to distort works somewhat as he serves his thematic-historicist, as well as his formalist, interest. Of course, his obligation to literary works requires him to guard as best he can—which "best" is never good enough—against intruding universal categories upon any work's uniqueness. . . .

Theory of Criticism:

Those seeking presence in the poem must see all elements that are potentially arbitrary as transformed by its creator into elements of internal necessity. Forced by modern skepticism to accept a language made up of none but empty signifiers, they see the poet as torturing his words into fulness in spite of what they were when he came upon them before the poem.

Perhaps the easiest way to see Krieger's desire to privilege the text is to show his opposition to those who would privilege either the author or the community of readers. For Krieger the text creates a "micro-langue" which is not reducible, as synecdoche, to some more universal cultural langue. Thus, Hirsch's view of synonymity and cultural determinism is a "contrary claim" to Krieger's desire to oppose poetic language and normal discourse:
If the parole is to the langue as the particular to the universal in the Platonic model, then all paroles—poetry among them—are equally subordinate, common subjects all. Structuralist uniformity, extending parole into écriture, here makes alliance with the claim of E. D. Hirsch in precluding—or at least demystifying in advance—the very concept of poetry as a kind of discourse.  

On the other hand, the values of poetic texts are separate from the readers who can discover those values. The passage below, although it may at first appear to valorize a reader-response poetics, is in fact a long way from the poetics of a Stanley Fish or Jonathan Culler.

In the greatest literary works, those documents which have throughout their history with us—been treated as elite, those which, in other words, constitute the literary canon in the Western tradition, the illusion of an autonomous, self-generating reflexivity in language persists for those trained to read them appropriately (that is, in ways appropriate to our conventions for reading our elite literary works).  

When Krieger argues that "most trained readers of poetry feel an acute difference" between the "self-generating play" of a poetic text and the "instrumental 'use' of words" which communicate a "predetermined extra-linguistic meaning," he is hardly arguing that the reader's activity is constitutive of meaning. He is instead implying that readers who are properly trained are able to perceive what actually exists in the text, even if it be but illusory.

The point is that Krieger's version of the autotelic text is far more sophisticated than the more straightforward objectivism of the New Criticism. It is everywhere his desire, as he admits, to bring together conflicting poetic theories; it makes his theory both rich and paradoxical. In the end, however, it is his impulse to bring
together these conflicting elements under the umbrella of autotelism, but this impulse leads to difficulties. The "as if" commitment, the self-denying presence as absence, the illusory nature of poetic fullness—all of these moves may (in a most Arnollian way) concede too much. It is possible that in trying to claim too much for poetic discourse Krieger is forced, finally, to claim too little.

Besides Krieger's long-standing respect for poetic discourse, there is another contemporary approach which places authority in the text. In a sense, this approach to poetic theory may in claiming too little, end in claiming too much. The two theorists who best exemplify this view are J. Hillis Miller and Paul de Man. Of course, at first sight these names may not seem to belong to this admittedly over-generalized category. For one thing they are often identified with the Derridean spirit and certainly appear in opposition to determinist theories. Nevertheless, there is much in their theories which suggests a formalist doctrine, and although they present many hypotheses which are self-contradictory, they are best seen, like Krieger, as outgrowths, rather than enemies, of the New Critical tradition.

The problem in discussing their theories is that they are purposefully designed to resist encapsulation. Their orientation appears essentially pragmatic, which places anyone who would characterize their approaches in a precarious position susceptible to the challenge of misreading. Miller is especially "uncanny" in this regard. In his most recent response to a characterization of his theory (Vincent
Leitch's "The Lateral Dance: The Deconstructive Criticism of J. Hillis Miller", he argues that "the only way persuasively to challenge deconstructive theory . . . would not be to construct an alternative theory but to show the inadequacy of the particular readings associated inextricably with whatever is 'theoretical' in such work."55

This is a confusing statement. The idea would seem to be that the proof is in the pudding, that one should not reject the theory if it produces interesting readings. This is sound enough, but it somewhat obscures Miller's desire to merge pragmatic aims with ontological claims. In other words, Miller is really arguing that the theory should be accepted as correct because it produces interesting readings. If other theories produce valuable readings—which of course they do—those theories are still somehow inferior. This is very strange. When Miller says that "seeing clearly cannot occur as abstract theory but only by way of reflection about concrete acts of interpreting particular works,"56 one should not be blinded to the fact that Miller does indeed adhere to an abstract theory.

This theory (or anti-theory) shows a great many affinities with the New Criticism. The first and major affinity—that the authority for interpretation resides in the text—is easily demonstrated. Here, for example, is a sample of statements taken from some of Miller's major theoretic essays of the 1970's:

"Theory and Practice: Response to Vincent Leitch" (1980)

This is just the point: that the readings of deconstructive criticism are not the willful imposition by a subjectivity of theory on the texts but are coerced
by the texts themselves. [The text involves a] deper-sonalizing or overpowering of the critic in the face of the linguistic force of the work . . . "57

"Stevens' Rock and Criticism Cure, II" (1976)

A poem, for example Stevens' "The Rock," is entirely self-sufficient. It does not need to have one word added to it.58

. . . [C]riticism is [then] a continuation of that activity of the poem.59

"Deconstructing the Deconstructers" (1975)

The text performs on itself the act of deconstruction without any help from the critic.60

The critic, then, still has his uses, though this use may be no more than to identify an act of deconstruction which has always already, in each case differently, been performed by the text itself.61

And in the final sentence to Miller's reading of Natural Supernatural-ism in "Tradition and Difference" (1972).

[Abrams'] failure to recognize its [i.e., difference, decentering, displacement] pervasive presence in texts both traditional and modern is perhaps the chief limi-tation of Natural Supernaturalism. (my underling)62

This is a typical New Critical gesture and it leads to the same sort of contradictions that are inherent in New Critical methodology. One must recall that the New Critics also rejected "univocal" meaning, but that in that rejection they discovered exactly what constitutes the literary text. This is also the move of Miller, and it leads him to contradictory statements like the following. On the one hand,

In place of the theory of interpretation pre-supposed in Natural Supernaturalism, Derrida, Nietzsche, and the others would put the notion that a text never has a single meaning, but is the crossroads of multiple
ambiguous meanings. A poem or a philosophical work is a 'suspens vibratoire' of meanings, in Mallarme's phrase. For Nietzsche there is no "objective" interpretation. The reading of a work involves an active intervention on the part of the reader. Each reader takes possession of the work for one reason or another and imposes on it a certain pattern of meaning.63

But, on the other hand, Abrams'

conception of the way texts have meanings is awry. Every one of his passages means in a different way from the way he assumes it does. Its meaning is multiple, vibrating, ambiguous. It cannot be reduced to a single, univocal statement but is "equivocal" or "multivocal."64

It would naturally be difficult for Abrams to understand how Miller could be so certain that Abram's reading was faulty if uncertainty was the inescapable rule.

What Miller fears most is exactly what the New Critics feared. The now-famous distinction between the "canny" (mislead) and "uncanny" (selfconsciously aware) critics rests solidly on a rejection of the "scientific" impulse. The "uncanny" critics, Miller is certain, are "at opposite poles from that of the canny critics, the semioticians or structuralists, diagramand and system-makers, seekers for a sound scientific base for literary studies."65

Already a clear distinction can be drawn, among critics influenced by these new developments, between what might be called, to conflate two terminologies, socratic, theoretic, or canny critics, on the one hand, and Apollonian/Dionysian, tragic, or uncanny critics, on the other. Socratic critics are those who are lulled by the promise of a rational ordering of literary study on the basis of solid advances in scientific knowledge about language. They are likely to speak of themselves as "scientists" and to group their collective enterprise under some term like "the human sciences." The human
"Science," for Miller, "is the illusion that seeks to 'correct' the abyss"; it is an illusion because the literary text defies any such monological closure. "The critic is not able by any 'method' or strategy of analysis to 'reduce' the language of the work to clear and distinct ideas." What one can't fail to recognize in all this is Miller's continual refurbishing of the "heresy of the paraphrase."

The work is seen as heterogeneous, dialogical rather than monological. It has at least two apparent grounds, centers, focal, or logos, and is therefore incapable of being encompassed in any single coherent or homogeneous interpretation.

This "abyssal" discomfort is no doubt the reason why the work of these critics [uncanny critics] sometimes encounters such hostility from Socratic reviewers and readers. In fact the moment when logic fails in their work is the moment of their deepest penetration into the actual nature of literary language, or of language as such.

Miller's assertion is by no means new. What does the deconstructive critic do? He simply remains true to the text in its labyrinth texture: he demonstrates that the text "has already dismantled itself" and that it "cannot be encompassed in a rational or logical formulation."

It may be helpful to dwell on Miller's own sense of interpretive certainty for a moment. This may best be seen by looking at Miller's criticism of Joseph Riddel's The Inverted Bell. Miller attacks Riddel, among other things, for failing to mark adequate distinctions between Derrida and Heidegger. (Miller himself offers a somewhat
problematic reading of Heidegger. He suggests, for example, that "Riddle's theory of language, like that of Heidegger, ... is in fact literal or mimetic." Miller is quite certain that he knows what Derrida and Heidegger are saying. He castigated Riddle for "waver[ing] continually back and forth between" these "two formulations [which] cannot by any means be reconciled." Now if Miller began by pragmatically and weekly suggesting that "there are obviously strong and weak critical misreadings, more or less vital ones," he doesn't maintain this timidity for long. One shouldn't forget that Miller himself has placed Heidegger and Derrida among the most privileged of literary (or self-deconstructing) texts. Nevertheless, everything in Miller's reading of Riddle's reading of Heidegger/Derrida attests to a rhetoric of certainty. One can't, for example, accuse Riddle of "distortions" without having some sense of adequation. Moreover, when Miller suggests that "there are genuine insights into Williams in Riddle's book, insights which put him closer to what is at stake in William's work than the far more adroit, witty, and economical reading by Kenner in A Homemade World," one is inclined to ask how Miller can say this unless he himself knows exactly "what is at stake in Williams' work." (One might also point out, parenthetically, that rhetorically what is really "at stake" in this passage is the question of hegemony rather than authority. Miller cannily damns with praise two competitive interpreters in one sentence.)

If one examines this sense of certainty in its application to Heidegger in another direction, one soon discovers another New Critical
element in Miller's thought. Heidegger has often been a support to Miller's interpretations. There are, for example, numerous passages in *Poets of Reality* which seem more than mere echoes of Heidegger's later work. One instance is the following passage in which Miller offers a full-throated personal endorsement of the meaning he finds in Wallace Stevens.

Merely to see being in things is not enough. It must be spoken. Through words man participates in being, for words of the world are the life of the world. Poetry does not name something which has already been perceived or put in words a pre-existent mental conception. The act of naming calls things together, gathers them into one, and makes present the things which are present. Speaking belongs to being, and in naming things in their presence poetry brings being into the poem. (my underlining)77

If one follows this idea, particularly the sentence underlined, one sees the same pattern emerging in Miller's criticisms of Abrams and Riddel. What he is particularly upset with is the implication that poetic language is referential. He is quite severe with Abrams on this point and offers the following statement after presenting the often quoted "there is . . . no such thing as an innocent image of myth . . . ."78

No metaphor or myth is a mere "symbolic convenience," separable from the thought it embodies. It is the body of that thought, the secret generator of the concepts it incarnates. In spite of the careful attention throughout Natural Supernaturalism to the fundamental metaphors and narrative patterns of the tradition Abrams describes, the tendency of his book is to imply that these figurative elements are no more than "symbolic conveniences," vivid or lively ways of representing concepts or moral abstractions ("love," "liberty," "hope," and the rest). Or they are ways of expressing states of mind which exist prior to them and are not essentially dependent on them. (my underlining)79
One cannot fail to hear, in this equation of tenor and vehicle, a certain Krieger-like tone. And in "Stevens' Rock and Criticism as Cure" there is an interesting collation of Miller's "Derridean" incentive with a Heideggerean impulse. First, one might note the New Critical overtones which characterize the opposition between inauthentic rationality and a poem's "mise en abyme."

If Stevens is right to say that "poetry must be irrational" and that "poetry must resist the intelligence almost successfully," then the moment when the intelligence triumphs over the poem, encompassing its mise en abyme with human reason, is the moment of the poem's failure, its resolution into a rational paradigm.80

But seven pages later, after Miller has explored several "scenes" in Stevens' poem, he comes to this conclusion:

The structure of each of these scenes is the same. It is in fact the traditional metaphysical structure of aletheia, the appearance of something visible out of the abyss of truth. Truth is, for Stevens too, evasive, veiled, feminine, and dwells at the bottom of a well. The revelation or unveiling of what has been hidden brings the truth momentarily into the open, out of Lethean forgetfulness, and displays it. This revelation expands to become a container of the whole or means of appropriating the whole, and then instantaneously hides the abyss or ground. It quickly becomes a fictions, an illusion, something hollowed out, a mere "rind" or "cull," something that never was, and so vanishes.81

Now this is an obvious Heideggerean statement. What Miller is suggesting is that the poem ultimately defies any one of its "items" to achieve a hierarchical position. Hence, as it brings truth into the openness of unconcealedness, it also collapses that ground and conceals as well. Just as important as the Heideggerean flavor, however, is the clear similarity with Krieger. Terms like "fiction," "illusion," "veiled," and "momentarily" suggest a poetics which
easily equates with Krieger's. For Krieger, the text is central; poetic discourse functions in contradistinction to referential language; scientific methodology is antithetic to the more legitimate critical awareness which sees the poetic text as at once both object and immediate; and the text creates in itself a presence which, in its illusory nature, is not vulnerable as is a less sophisticated ontological reification. For Miller, the same pattern holds: the text, in its deconstructive nature, is central; poetic discourse illustrates a self-conscious awareness of language's referential impossibility; scientific methodology is an inappropriate and self-deluding critical application; and the text creates in itself its own *mise en abyme*, an absence which, as the only legitimate metaphysical truth, initiates the text's presentational function.

Paul de Man's work evidences a similar pattern, although it is perhaps even more difficult to classify his theoretic aims than it is Miller's. It is hard to know how to characterize a theorist who in one essay can say that "very little has happened in American criticism since the innovative works of the New Criticism" but who, in another essay, also argues that "American formalism" "has not produced works of major magnitude." This is a critic who occasionally argues forcefully that literature "may differ from critical or discursive writing in the economy of its articulation, but it is not different in kind," but who, on other occasions, seems determined to privilege literary discourse as "the only form of language free from the fallacy
of unmediated expression."

De Man is an ambidextrous critic who in "The Rhetoric of Blindness" can catch Derrida for not recognizing music, as Rousseau recognized it, as indicative of a temporal, diachronic movement antithetical to the logocentric, or melocentric, dream; but a critic who in "Genesis and Genealogy" seems to accept the valorization of music within the Nietzschean scheme as a melocentric (Dionysian) impulse because it receives within the Nietzschean text a coextensive undermining by the Apollonian argument "against the subjectivity of the lyric."86

Such apparent contradictions would not be disquieting if de Man did not exude an omnipresent surety of intention, interpretation, and history. The entire thrust of Blindness and Insight, for example, is oriented toward showing the inherent blindness of the interpreter, but despite de Man's verbal homage to his own inescapable blindness, the tone of his style is more than a gentle reminder that de Man himself seems to escape a blinded vision. Thus, when he claims that "Rousseau is one of the group of writers who are always being systematically misread"87 de Man implies that his own insight is self-conscious and accurate. When de Man faults Derrida, it is only because the Derridean reading fails to adjudicate the text accurately:

Derrida's story of Rousseau's getting, as it were, a glimpse of the truth but then going about erasing, conjuring this vision out of existence, while also surreptitiously giving it to it and smuggling it within the precinct he was assigned to protect, is undoubtedly a good story. It reverses the familiar pattern of "le
brâconnier devenu garde-chasse," since it is rather the
gamekeeper himself who is here doing the poaching. We
should perhaps not even ask whether it is accurate, for
it may well be offered as parody or fiction, without
pretending to be anything else. But, unlike epistemo-
logical statements, stories do not cancel each other
out, and we should not let Derrida's version replace
Rousseau's own story of his involvement with language.

The phrase "a glimpse of the truth" is revealing, for it is de Man's
intention to show that the "truth" (i.e., the deconstructive denial
of presence) is not merely glimpsed and then denied but that it is
sustained in the text itself. This insight, of course, is not limited
to Rousseau's text, for as de Man asserts in "Genesis and Genealogy,"
the "exercise in genetic 'deconstruction' [has] more than heuristic
significance." The self-deconstructing nature of rhetoric be-
comes, in fact, constitutive of all valuable texts and de Man's certi-
tude leads him in "Semiology and Rhetoric" to prophesy with confidence
that the elucidation afforded by deconstructive analyses "will in
fact be the task of literary criticism in the coming years."

This is a certainty which, like Miller's, leads to some difficult
problems. On the one hand, de Man, like Miller and the New Critical
formalist, is opposed to scientism in interpretive theory. For de Man,
whether in his veneration of the deconstructive model or his valor-
ization of the allegorical mode, the scientific desire which attempts
to fix the literary text as intrinsically unique is misguided. Ostensi-
ibly, the method which de Man uses to negate the would-be legitimacy
of a scientific criticism is to posit that the "difference between"
literature and criticism is "delusive." Since the "semantics of
interpretation have no epistemological consistency," they "can therefore not be scientific."92 Thus, those approaches "which try to apply extrinsic methods to material that remains defined intrinsically and selectively as literary language" are, like a "structuralist poetics," "assumedly scientific,"93 but they are also "prescriptive" rather than "descriptive" and stem from a "model for the act of interpretation [which] is being constantly oversimplified."94 On the other hand, if the act of interpretation is inexhaustive and "notions of accuracy and identity" do not belong "in the shifting world of interpretation,"95 it is very difficult to understand how de Man can avail himself of the certitude necessary to make his own quite definite pronouncements. Actually, de Man's own view of "misreading" suggests that criticism is secondary to the privileged literary text and the argument that literature affords a radical "indetermination" or a "suspended uncertainty"96 should not blind one to the radical determinative tone of de Man's assertion.

The critical theory of de Man is thus hardly in opposition to formalist tendencies. Like Miller, de Man's basic argument is that one should respect the literary text, which, as it turns out, means that one must be sensitive to the a priori decision that the text embodies its own a poria. In "Semiology and Rhetoric" de Man is fairly clear:

The deconstruction is not something we have added to the text; it constituted the text in the first place. A literary text simultaneously asserts and denies the authority of its own rhetorical mode; and, by reading the text as we did, we were only trying to come closer
to being as rigorous a reader as the author had to be in order to write the sentence in the first place. 97

De Man's poetics is thus no less prescriptive than the scientism of structuralist or formalist theories that he rejects. A respect for the text entails the recognition that the valuable text "consists of the presence of a nothingness." 98

Poetic language names this void with ever-renewed understanding and, like Rousseau's longing, it never tires of naming it again. This persistent naming is what we call literature. 99

De Man's characterization of the New Critical blindness, caused by a commitment to organic form, which nevertheless led to an insight into the ambiguity and irony of poetic language, suggests that de Man himself merely wishes to push forward the insight in a now unblinded vision. In the end, however, things are not that simple. Whether one argues for the presence inherent in the reconciliation of opposites of an organic microcosm or the presencing of an absence through the rhetoric of dynamic self-refutation, the move to set the text apart as other is much the same and de Man's own anti-systematic system begins to haunt him.

There is, for example, an important passage in "Semiology and Rhetoric" where de Man defines the formalist impulse. De Man recognizes formalism as "an all-absorbing and tyrannical muse" 100 and that in the reoccurring formalist perspective "literature cannot merely be received as a definite unit of referential meaning that can be decoded without leaving a residue. 101 This Statement is accurate enough and calls to mind the New Critical emphasis on the inadequacy
of paraphrase, the notion that poetic meaning escapes the ordinary reference of the text through a dramatic or infra-referential rhetorical structure. There is a "residue" of meaning in the poetic use of language which defies the logic of the text. In "Semiology and Phetoric," as well as elsewhere, it would appear that de Man's basic intention is to deny metaphoric presence by exposing the duplicity of a metonymic displacement which is everywhere in language and exaltedly so in literary language. Nevertheless, one might argue that de Man himself is moving toward a restatement of the formalist impulse as he has himself defined it. That definition, for instance, is interesting when compared with de Man's explication of The Birth of Tragedy, an exemplar of the deconstructive text. Nietzsche's text does compel "the reader to enter into an apparently endless process of deconstruction,"¹⁰² but de Man also asserts that "the semantic dissonance of The Birth of Tragedy is precisely this residue of meaning that remains beyond the reach of the text's own logic ... ."¹⁰³

Have we merely been saying that The Birth of Tragedy is selfcontradictory and that it hides its contradictions by means of "bad" rhetoric? By no means; first of all, the "deconstruction" of the Dionysian authority finds its arguments within the text itself, which can then no longer be called simply blind or mystified. Moreover, the deconstruction does not occur between statements, as in a logical refutation or in a dialectic, but happens instead between, on the one hand, metalinguistic statements about the rhetorical nature of language and, on the other hand, a rhetorical praxis that puts these statements into a question. The outcome of this interplay is not mere negation. The Birth of Tragedy does more than just retract its own assertions about the genetic structure of literary history. It leaves a residue of meaning that can, in its turn, be translated into statement, although the authority of this second
statement can no longer be like that of the voice in the text when it is read naively. The nonauthoritative secondary statement that results from the reading will have to be a statement about the limitations of textual authority.104

There is, in fact, little in this statement which is antithetical to New Critical theory. The meaning of the text resides in the text itself; the rhetorical or "theatrical" structure of the text creates a non-logical "residue of meaning" through undermining any univocal voice; and the translation of this meaning to secondary statement must recognize its own impotence since the truth which literary discourse affords is exactly the calling into doubt of authoritative statement. There is much in de Man that remains with the formalist spirit; clearly, the question of authority—albeit for de Man a theoretical bogus question—is, in the end, answered by the text.

The third answer to the question of authority, that which argues for meaning as constituted by the productive act of reading, has recently found numerous supporters. A cousin to deconstructive criticism, such reader-response criticism generally begins in reaction against objectivist theories and, imbued with a grounding egalitarian fervor, valorizes a subjective and radical indeterminancy. Here, too, as with other approaches to poetics, the challenge to scientism is paramount. At first sight, as Jane Tompkins explains, reader-response critics "appear to be undoing the effort of New Critics to hold the line against science" since they invite "discussion of personal experience in literary interpretation."105 In the end, however, reader-response criticism,
like most other theories of literature, defines itself in opposition
to the scientific impulse. Tompkins goes on to explain that

... in fact response-centered critical theory is en-
gaged in exactly the same power struggle with science
that played so large a role in the formation of New Criti-
cal doctrine. The difference is not one of goals but of
tactics. Instead of trying to come up with a defense of
poetry that will satisfy positivist demands for objec-
tivity and verifiability, as the formalists did, reader-
oriented critics attack the foundations of positivism
itself. Instead of protecting literature from unfavor-
able comparison with science by maintaining that literary
language is uniquely constitutive of meaning whereas
scientific language merely reflects it, response-centered
theory, in its most recent formulations, denies the exis-
tence of any reality prior to language and claims for
poetic and scientific discourse exactly the same relation
to the real—namely, that of socially constructed versions
of it.106

This emphasis on "socially constructed" meaning, however, leads to a
severe problem; when carried to its logical conclusion, it lends it-
self to a regimented historicism, a sort of culturally based scientism.
This is particularly true of the two most influential varieties of
reader-oriented criticism, that of Stanley Fish and Jonathan Culler.

There are, of course, numerous versions of reader-response criti-
cism besides those of Fish and Culler. They all begin, however, by
recognizing the importance which the individual reader plays in the
establishment of meaning. The theories of Wolfgang Iser and Norman
Holland, for example, place the reader in a more significant role
than does formalist theory, yet despite an apparently moral commitment
to individual rights, the interpretive response of the reader is al-
ways in these theories a response to an objective entity which sets
off parameters of legitimacy. David Bleich's version of subjective criticism, on the other hand, really brackets a consideration of meaning in order to deal with questions of power within the classroom. Bleich's theory of negotiated response—a theory which is remarkably similar to Kenneth Burke's rhetoric of motives—places considerations of meaning within a dynamic societal interaction.

Stanley Fish's theory also begins with the same desire to privilege the reader. In fact, much of Fish's energy has been directed at showing that any use of language lends itself to an inexhaustible number of legitimate meanings and that each possible meaning is constituted by the interpretive context utilized by the individual reader. Fish's rhetorical dexterity is unparalleled in this regard, and his verbal gymnastics have perhaps done more to point up the inadequacies of formalist doctrine than have the arguments of Holland or Bleich. Nevertheless, Fish's own arguments force him to flirt with an objectivism that he clearly wishes to avoid, or they lead him to a hermeneutical impasse that flirts with absurdity. By the time Fish writes "Interpreting the Variorum" he has apparently given up his earlier argument that the sequential nature of language causes readers to reformulate their expectations continually. This emphasis on the temporal structure of the sentence (or the line), although it calls for the postponement of closure, is, at this point in Fish's career, still an emphasis on the formal properties of a text, and in characterizing an objective property of textual actualization Fish apparently
demands a particular sort of reader response. When (in his more recent criticism) Fish abandons this argument he opts for a radical subjectivism with a democratic enthusiasm: texts are made solely by readers.

A reader other than myself who, when presented with Lycidas (please keep in mind that the status of Lycidas is what is at issue), puts into execution a different set of interpretive strategies will perform a different succession of interpretive acts. (I am assuming, it is the article of my faith, that a reader will always execute some set of interpretive strategies and therefore perform some succession of interpretive acts.) One of us might then be tempted to complain to the other that we could not possibly be reading the same poem (literary criticism is full of such complaints) and he would be right; for each of us would be reading the poem he had made.107

This desire to "give the reader his due" is certainly important, for there has been too little emphasis on audience participation in the communication triangle which constitutes a transactional meaning. But Fish has overemphasized the significance of his insight. The problem with his argument is that it is impossible to justify presenting it at all. If texts are made entirely by the interpretive predispositions of readers, then Fish's own text (like any text) becomes nothing more than a structure of slot and substitution possibilities which are legitimately actualized by any interpretive strategy.

Fish acknowledges this absurdity in the final sentence of his essay: "I say it [i.e., present this essay] to you now, knowing full well that you will agree with me (that is, understand) only if you already agree with me."108 This is rhetorically clever. It is logically consistent with everything Fish has said, but it is obviously nothing more than a pro forma homage to that logic that it leaves the reader
with a smile. Rhetorically, it is really an appeal to the audience by speaking to the ethos (i.e., the humility) of the writer and, as a confession, it allows Fish to have his argument and deny it at the same time. It is entertaining because it is clear that Fish cannot really believe it or else he would have no need to voice either the argument or the conclusion at all.

This movement toward absurdity is also demonstrated in other places in the essay. At one point, for example, he compares *Lycidas* and *The Waste Land* to illustrate how texts are written by readers.

> If I read *Lycidas* and *The Waste Land* differently (in fact I do not), it will not be because the formal structures of the two poems (to term them such is also an interpretive decision) call forth different interpretive strategies but because my predisposition to execute different interpretive strategies will produce different formal structures. That is, the two poems are different because I have decided that they will be. 109

This is tricky. Fish has made his surface argument too easy by pointing to two texts that are typically taken, at least at some point, to be different, but he cleverly slips in that in his own selection of interpretive strategies these two texts are the same. The logic is clear: *Lycidas* and *The Waste Land* are, for Fish, not different because he exercises the same interpretive strategy in each case. But there is an important distinction between asserting similarity and identity. The discovery of similarity is always based on differences; hence, Fish must be suggesting that the two texts are identical if his argument is not internally flawed. In fact, he asserts at one point that "it has always been possible to put into action interpretive
strategies designed to make all texts one, or to put it more accurately, to be forever making the same text." In order for Fish's assertion about *Lycidas* and *The Waste Land* to be consistent with his overall argument, therefore, he must argue that the two are identical because he chooses to read them as such. This is not the same argument as that which says the two texts are two versions of the same pattern, theme, style, structure, tone, or genre. They must be identical; else there is some residual difference not accountable by interpretive strategy. Now, if Fish wishes to assert that the two texts are identical that is his privilege, but once having made such an assertion there is, in fact, nothing more which can be said. Sameness, in the sense of identity (which is the only way Fish can use the term), is never possible to explain; the only way to show identity is through an appeal to self-evident intuition. To show similarity, however, always implies an assumed difference. Thus, the only two possibilities open to Fish are silence or contradiction.

If the above challenge seems pedantic, it is important to realize that it actually points to the basic difficulty with Fish's whole theory. One must grant with Fish that "communication is a much more chancy affair than we are accustomed to think it." However, in illustrating this problem Fish does little to explain it. Having asserted a radically subjective theory, which seems directed toward solipsism, Fish retreats to the notion of "interpretive communities" to explain how communication can take place at all.
Interpretive communities are made up of those who share interpretive strategies not for reading (in the conventional sense) but for writing texts, for constituting their properties and assigning their intentions. In other words these strategies exist prior to the act of reading and therefore determine the shape of what is read rather than, as is usually assumed, the other way around.¹¹²

There is much to recommend this statement, but there is nothing in Fish's theory which can explain how interpretive communities ever come about. It is important to Fish to explain that "interpretive strategies are not natural or universal, but learned";¹¹³ however, once he has separated interpretive strategies from the texts which they constitute it is hard to see how any strategy can be learned at all. Two people simply share a strategy or they don't. What is missing in Fish's theory is the possibility that texts give rise to interpretive strategies just as they are also constituted by acts of interpretation. Learning can only take place when there is change and Fish's system cannot allow for change since there is nowhere any development of what might constitute the impetus for such a process. Given Fish's theory, communication is even a more "chancy affair" than he admits. It is misleading to say that the "consolidation of interpretive communities . . . allows us to talk to one another,"¹¹⁴ for in Fish's account the sharing of interpretive strategies makes talk irrelevant and communication unnecessary. Moreover, if Fish began by wishing to venerate the sanctity of the individual interpretive act, once he introduces the notion of interpretive communities in the way he has—and this move is necessary to avoid complete solipsism—he has provided a sort of back-handed support to the normative and cultural
objectivism of someone like Jonathan Culler.

In fact, Culler's theory of "literary competence" begins where Fish's theory of "interpretive communities" ends. In his most recent book on literary theory, *The Pursuit of Signs*, Culler discovers much in Fish's theory to admire, much that "is fundamentally attractive." In the end, however, Culler sees the "admirable humanism" of Fish's "focus on the reader" as an overly enthusiastic commitment to individual rights which threatens to "collapse" the innovative critical theory Fish inaugurates. For Culler, meaning is not an individual creation but the result of applying to the text operations and conventions which constitute the institution of literature. A misplaced desire to praise man as the originator of meanings can only hamper the attempt to explain how these meanings arise.

Culler correctly sees that the notion of "interpretive communities" is an underdeveloped idea in Fish, but he also feels that "fortunately Fish's readers can rescue much from the general collapse and self-destruction of his theory and can find in it an implied project of considerable importance: an investigation of reading as a rule-governed, productive process."

A student of structuralism and semiotics, Culler never tires of pointing to the circular relationship between *parole* and *langue*, in the Saussurean scheme, or performance and competence, in Chomsky's generative linguistics. Every one of his books clarifies the difficulty of separating the individual and particular actualization of a system (*parole*, performance, the text) from the system itself.
(langue, competence, intertextuality), for it is the system which
gives rise to but is also constituted by the particular actualizations.
However, in the theory which Culler propounds he seems to forget this
important fact which he has conscientiously and repeatedly emphasized,
for it is also everywhere Culler's intent to treat the system as if it
were a fixed and delineable mechanism which gives rise to all particu-
lar actualizations through direct causation. The individual act of
interpretation, for example, becomes for Culler nothing more than a
specific illustration of the institutional or cultural system of inter-
pretation.

Interpretations of individual texts, in this view,
are simply a display of that literary competence which a
poetics must attempt to analyze. Indeed, the interpre-
tation of individual works is only indirectly related to
the study of literature. If the critic wishes to produce
new and subtle readings, he is at perfect liberty to
entertain himself in this way, but he should not do so
in the belief that he is thereby making important contrib-
utions to the study of literature. An understanding of
literature, both as an institution and an activity, in-
volves an understanding of the conventions and operations
which enable works to be written and read.118

Culler conveniently forgets that the literary langue is both producer
and product of the specific acts of the interpretive reader. Thus,
despite all of his admirable concern for the educational process, he
is left with an apparently static system; eschewing the individual
act of interpretation and concentrating only on a normative competence,
Culler seems to have bracketed a consideration of the necessary inter-
relationship of the diachronic process and the synchronic system. For
Culler the "task" of literary theory is to "outline the conditions
and parameters of response; it must account for responses by investigating the conventions and norms which enable responses and interpretations to be as they are. 119

The impulse toward objectivity is unmistakable. If "the text itself" is not the "source of objectivity, one must assert," Culler argues, "that the notion of 'what the text says' itself depends upon common procedures of reading," 120 and Culler's program is to make these apparently objectifiable procedures more consciously visible. Thus, if Hirsch, in his open veneration of a nineteenth century model of science, seems to represent a polar opposition to reader-response criticism at first sight, it is not difficult to see how reader-response criticism can easily come full circle and endorse a reader-oriented objectivism which is quite similar to the authorial objectivism which Hirsch promotes. Culler's emphasis on educational priorities is, in fact, exactly the same sort of concern one finds in Hirsch's recent The Philosophy of Composition, the only difference being that Hirsch is concerned with literary norms for the writer and Culler is concerned with literary norms for the reader. If, for example, one were to substitute "writer" for "reader" and "writing" for "reading" in the following passage from Culler, it could as easily have come from The Philosophy of Composition as from The Pursuit of Signs:

... one should stress that the whole institution of literary education depends upon the assumption that is being defended here: the assumption that one can learn to become a more competent reader and that therefore there is something (as series of techniques and procedures) to be learned. We do not judge students
simply on what they know about a given work; we presume
to evaluate their skill and progress as readers, and that
presumption ought to indicate our confidence in the exis-
tence of public and generalizable operations of reading.

Hirsch is similarly concerned with the "normative character of written
speech" and the "underlying principles of composition."

These principles, once established, may be codified;
once they are codified, their rudimentary application can
be taught and learned with greater efficiency, on the
basis of research which, one dares to hope, will yield
ever greater agreement on the nature and best application
of these principles.

This similarity between Hirsch and Culler has been explored earlier
(see Chapter Two); the point here, as it was in Chapter Two, is that
if any one of the major elements from the communications triangle (as
it is represented by Jakobson or James Kinneavy) is selected as the
sole input for the constitution of meaning, the resultant theory lends
itself to an objectifying impulse. Thus, a theory like Hirsch's,
which selects the encoder, emulates a nineteenth century conception
of the scientific model; a theory like Culler's, which selects the
literary and cultural norms of the decoder, also arises from a desire
to delineate objective criteria; and a theory which selects the text
itself—either the more openly formalist type or the more recent
deconstructive variety—lends itself to an authoritative tone of
certitude and flirts with the scientism it seeks to avoid.

While there is much to recommend all of these theories, each
answer to the question of authority poses problems. To say that
the author creates meaning, to say that the language of the poetic text
is constitutive of a unique, imaginative meaning, to say that meaning is produced by the interpretive act—each of these makes sense. But each is promoted at the expense of the remaining two, and the mutual exclusivity of these contemporary theories makes any rapprochement among the three difficult. To solve this problem—to answer the question of authority with finality—is perhaps impossible, and it would certainly be naive to pretend that the solution is offered in these pages. Yet, it is also clear that science continues to play an important role in contemporary critical theory. It is an omnipresent partner; sometimes silent, occasionally a welcome ally, often a hated foe, but inevitably present. The bulk of this dissertation has attempted to show that the attack against science has been misguided and based on an outmoded conception of the nature of scientific inquiry. The argument has been that the two are better viewed as colleagues rather than enemies. If this is true, then it is possible that the theories and discoveries of twentieth-century science may offer a direction out of the impasse which the question of authority poses. The next section will suggest this direction.

-ii-

Science, Poetry, Free Play

Any connection between science and poetry—indeed, any serious approach to contemporary critical theory—must wrestle with the influence of Jacques Derrida. In one way or another the Derridean challenge to traditional metaphysics and the accompanying investiture
in the problematic of language have inspired and permeated contemporary critical argument. Whether one holds, with Culler and Hirsch, that Derrida is a trickster or "cognitive atheist," whether one see Derrida as the heroic "boa-deconstructor," as does the so-called "Yale School," or whether one takes a more temperate view, somewhere in between these two extremes, it is clear that any attempt to ignore the power of the Derridean argument is simply naive. Moreover, the Derridean critique is obviously of great importance to any theory which seeks a rapprochement between science and poetry, since the questions of determinacy, authority and science are at the heart of Derrida's concern. If the deconstructive model is not a "positive science," it would nevertheless appear that, in not being simply "one of the sciences of man" or even "just one regional science among others," grammatology is still indicative of some sort of "meta-rationality" or "meta-scientificity." In fact, the relationship between the "scientific" desire for determinacy and the inescapable alterity of language is at the heart of the Derridean perspective. This relationship is also at the core of the difficulty which interpreting Derrida inevitably presents. If, for Derrida "the constitution of science or a philosophy of writing is a necessary . . . task," it is also a "difficult" one, partially, one must assume, because it is the power of the grammatological science of writing to point up the very "incompetence of science" itself.

This rather strange and contradictory relationship between science,
language, and the science of language is indicative of the contradictory move which is everywhere in Derrida. There are, in fact, two basic issues which form the Derridean argument, and these two issues seem, at least at first sight, to preclude assimilation. Thus, there has been a tendency to reduce Derrida to one of the two issues—a tendency best illustrated by the Yale appropriation of that side of Derrida which advances an apparently nihilistic flavor. This tendency is understandable (after all, it attests to the "desire" for resolution), but, it must be added, it is the tendency which Derrida himself wars against. The alternative to such reductive appropriation is to remain steady and describe as precisely as possible the elements of Derrida's thought in order to discover their true merit. Frank Lentricchia provides a fine example of this much needed and balanced perspective, but even Lentricchia may not have squarely faced the import of the Derridean elements he describes with such insight. Thus, of all the figures he treats in his valuable After the New Criticism it is only Derrida about whom, one feels, Lentricchis remains uncertain. It is as if Lentricchia gives the reader two Derrida's: the Derrida of free play and the centerless text, and the Foucault-like Derrida of historical and cultural centers. This alone, however, is important for it is a significant step in correcting the somewhat one-sided view of Derrida promulgated by Miller and de Man. Nevertheless, one can't help but wish that on this point Lentricchia had been even clearer. It is, for example, difficult to know how to understand Lentricchia's attitude if he can write on one page that "the funda-
mental aspects of Derrida's writing plainly do not sanction a new formalism..." and yet also write, eight pages later, that "Derrida's deconstructive project is formalist through and through."133

Lentricchia's insight into the twin elements of Derrida's thinking is, nevertheless, correct, and it would be presumptuous to suggest that one could easily offer an improvement to the thinking of a critic who is as sensitive to nuance as Lentricchia. Still, the apparent dichotomy in Derrida's thinking has an important analogue in those theories of modern science which were explored in Chapter Three, and it is this analogous relationship which forms the first of three elements pointing the direction out of the impasse which the question of authority poses. To see this analogue it is perhaps necessary to detail more precisely the two sides to the Derridean view.

The first side is what might be labeled as the popular Derrida. This is the side to Derrida which really needs little introduction, for it is paraphased by almost all theorists, enthusiasts and detractors alike. This is the Derrida who inveighs against plenitude, presence, logocentrism, the voice, telos, and all variations of idealism, the Derrida who, partly in an attempt to avoid institutionalizing the deconstructive methodology, coins terms after term to illustrate the duplicity of language and the impossibility of centered and independent structures: the Derrida of différence, supplément, écriture, dissemination, pharmakon, the trace. Invariably the argument used is linguistic in orientation and is designed to point up the nonplenitude of any origin, the dependence of what is on what is not, the dependence
of presence on absence. The most well-known illustration of this move is probably the neologism of différencé, difference spelled with an a to suggest the arbitrary nature of the differential sign system and the necessary deferral inherent to the temporal play of infinite substitutions which allows for signification. As Derrida puts it, "every concept is necessarily and essentially inscribed in a chain or a system, within which it refers to another and to other concepts, by the systematic play of differences." Just as every phoneme has its identity only because it differs from other phonemes, so does every signifier have its identity, not because it represents some potentially present signified, but because if differs from, and thus depends upon, the other signifiers which it is not. Thus, différencé

is what makes the movement of signification possible only if each element that is said to be "present," appearing on the stage of presence, is related to something other than itself but retains the mark of a past element and already lets itself be hollowed out by the mark of its relation to a future element. Thus trace relates no less to what is called the future than to what is called the past, and it constitutes what is called the present by this very relation to what it is not, to what it absolutely is not; that is, not even to a past or future considered as a modified present.

From this realization that the "use of language" "presupposes a retention and protention of differences, a spacing and temporalizing, a play of traces," it follows that to allow any term or concept to assume the privileged status of a full and central presence is but a delusion since the very concept of presence is dependent upon a system of difference and deferral. "Presence is a determination
and effect within a system which is no longer that of presence but of difference . . . ."\(^{137}\) Or as Derrida puts it in *Positions*, with an unusual succinctness, *différance*

 confirms that the subject, and first of all the conscious and speaking subject, depends upon the system of differences and the movement of *différance* that the subject is constituted only in being divided from itself, in becoming space, in temporizing, in deferral; and it confirms that, as Saussure said, "language [which consists only of differences] is not a function of the speaking subject." At the point at which the concept of *différance*, and the chain attached to it, intervenes, all the conceptual oppositions of metaphysics . . . become nonpertinent.\(^{138}\)

Armed with such linguistic awareness, Derrida can then set about uncovering the moment of a text's indecidability, the deconstructive moment when any argument for a full and independent presence rests upon the contradictory duplicity of language. Typically, Derrida's attention is drawn toward texts which venerate the self-conscious awareness of the living subject as actualized/embodied in the self-presencing of speech. Whether it is Husserl's veneration of expression over communication, Rousseau's identification of speech with a natural goodness and writing with a cultural oppression, or Saussure's relegation of writing to a secondary status and mere reduplication of privileged speech, Derrida is able to show that in each case the privileged term is necessarily contaminated by its inverse. In each case the inside is dependent upon the outside: thus, expression depends on communication, nature upon culture, speech upon writing.

It is this side of Derrida which apparently has given license
to the seekers of the void. If the circular completion of the book is to be replaced with the free play of the intertextual trace and if this knowledge should be affirmed with a Nietzschean joy, one must be able to gaze steadily into the abyss without succumbing to the desire for the anodyne of a deluded presence. As Derrida writes in *Of Grammatology*, "the supplement is always the supplement of a supplement," and although "one wishes to go back from the supplement to the source," "one must recognize that there is a supplement at the source." If "there is nothing outside the text" and if textuality and the concept of supplementarity are one and the same, then it follows that "the indefinite process of supplementarity has always already infiltrated presence" and that the text "in an indefinitely multiplied structure" is "on abyme." Honesty dictates that one face and proclaim this textual abyss.

Or so goes the theory. This then becomes the question which the followers and the dissenters have taken as the central issue for debate. There is, however, another side to Derrida which requires deliberation if his basic message is to be heard. To valorize free play and the decentering movement of language, and to ignore completely that side of Derrida which projects the use of language as a product of an historically and culturally based system of differences, is to risk venerating the very concept which Derrida exposes as false. It is wise to heed Lentricchia on this issue:
Put as boldly as possible, Derrida's point is that once we have turned away from various ontological centerings of writing, we do not turn to free-play in the blue, as the Yale formalists have done. Rather, it would appear that our historical labors have just begun. It is in the very trace-structure of the sign in other words, that we may locate Derrida's most fundamental attack on the metaphysics of presence, since it is in the sign conceived as trace that the present as an in-itself is broken up and reconstituted as a synthesis of retentions and protentions, a relation to both as a past and a future.143

There are, in fact, numerous instances in Derrida's writings where he emphasizes language as cultural production, and Lentricchia points out several crucial passages, the most important of which is Derrida's angry response to a question presented at his reading of "Structure, Sign, Play" at Johns Hopkins:

I didn't say there was no center, that we could get along without the center. I believe that the center is a function, not a being--a reality, but a function. And this function is absolutely indispensable. The subject is absolutely indispensable. I don't destroy the subject; I situate it.144

Lentricchia also points to other "statements, too numerous to quote in full, that difference 'makes the presentation of being-present possible' . . . , that consciousness is a 'determination' and an 'effect' within a system of difference, not a matrical form of being."145 Perhaps the clearest statement of the cultural production of meaning, as Lentricchia himself notes, is a most significant passage from "Differance."

Since language (which Saussure says is a classification) has not fallen from the sky, it is clear that the differences have been produced; they are the effects produced, but effects that do not have, as their cause a subject or substance, a thing in general, or a being
that is somewhere present and itself escapes the play of difference.\textsuperscript{146}

It is also worth noting that another statement, much like the one above, assumes a crucial place in Derrida's interview with Julia Kristeva (reprinted in Positions):

The activity or productivity connoted by the of \textit{différence} refers to the generative movement in the play of differences. The latter are neither fallen from the sky nor inscribed once and for all in a closed system, a static structure that a synchronic and taxonomic operation could exhaust. Differences are the effects of transformations, and from this vantage the theme of \textit{différence} is incompatible with the static, synchronic, taxonomic ahistoric motifs in the concept of structure. But it goes without saying that this motif is not the only one that defines structure, and that the production of differences, \textit{différence}, is not astructural: it produces systematic and regulated transformations which are able, at a certain point, to leave room for a structural science.\textsuperscript{147}

In short, when Derrida says that "without the possibility of \textit{différence}, the desire of presence as such would not find its breath-space,"\textsuperscript{148} or that (eschewing a teleological or organic sense of history) "only differences can be, from the outset and in all aspects, 'historical,'"\textsuperscript{141} it is important to credit his words.

If anything, the point which Lentricchia makes needs even more emphasis. Specifically, it needs to be made clear that the view of writing and language which Derrida advances is based as much upon cultural and inter-subjective transformations as it is upon any notion of a radical freedom. Again and again Derrida attempts to make clear that to secure a vantage outside of the system of culturally instituted differences is not possible. Even the project
of deconstruction, Derrida argues in several places, depends upon the historical epoch to which one belongs. In fact, to ignore the cultural differences which an historical analysis can provide is to miss one of the major motifs of the deconstructive model. In *Positions*, for example, Derrida writes:

The incision of deconstruction, which is not a voluntary decision or an absolute beginning, does not take place just anywhere, or in an absolute elsewhere. An incision, precisely, it can be made only according to lines of force and forces of rupture that are localizable in the discourse to be deconstructed. The topical and technical determination of the most necessary sites and operators—beginnings, holds, levers, etc.—in a given situation depends upon an historical analysis.  

Or again in *Of Grammatology*:

There remains to be written a history of this metaphor, a metaphor that systematically contrasts divine or natural writing and the human and laborious, finite and artificial inscription. It remains to articulate rigorously the stages of that history . . . and to follow the theme of God's book (nature or law, indeed natural law) through all its modifications.  

And after presenting a series of quotations, from Galileo to Jaspers—all of which represent variations of the metaphor of self-presence—Derrida writes most emphatically: "above all, the profound differences distinguishing all these treatments of the same metaphor must not be ignored."  

This is hardly the position of one who wishes to proclaim the void and leave it at that. Thus, Lentricchia is eminently correct when he asserts that "semiological systems based on the principle of difference 'have been produced,' and the key questions become what and by whom: what discharges of power, under what networks of
guidance, to what ends, and in what temporal and cultural loci have semiological systems been produced?"153 What should be added to this, however, is that it is part of Derrida's thesis that language itself must give rise to systems of inter-subjective meaning; that is, language is not simply manipulated by powers from the outside (although this is true enough); the very nature of language creates hierarchization and power. In other words, it is always the case that language embodies two poles: the necessity for fixed centers of meaning and the inescapable demand that such fixed centers be upset from within. The idea is easily illustrated in Derrida's comments on Lévi-Strauss. First it is important to remember that one of the major motifs of Derrida's project is to show that writing is erroneously made an "outcast" from a falsely privileged speech. Instead, the characteristics attributed to writing are, for Derrida, the very characteristics of language. As Derrida puts it in Of Grammatology, "the exteriority of the signifier is the exteriority of writing in general, and ... there is no linguistic sign before writing."154 Or again, "... language is first ... writing."155 Now if one characteristic of writing is that it clearly suggests an alterity, an inescapable distance between signifier and signified, and a re-presentational rather than presentational function, another characteristic is that writing involves a codification which ratifies hierarchies and creates a classificatory reality. This latter characteristic is repeatedly stressed in Derrida's comments on "The Writing Lesson" from Tristes Tropiques. Derrida takes Lévi-Strauss to task for the same romantic
valorization of speech which Derrida finds in Rousseau. He suggests that the description of the Nambikwara in *Tristes Tropiques* "sets up a premise—the goodness or innocence of the Nambikwara—indispensable to the subsequent demonstration of the conjoint intrusion of violence and writing."\(^{156}\)

Only an innocent community, and a community of reduced dimensions (a Rousseauist theme . . . ), only a micro-society of non-violence and freedom, all the members of which can by rights remain within range of an immediate and transparent, a "crystalline" address, fully self-present in its living speech, only such a community can suffer, as the surprise of an aggression coming from without, the insinuation of writing, the infiltration of its "ruse" and of its "perfidy."\(^{157}\)

In other words, Derrida is quite willing to accept that political and cultural hierarchization are attributable to writing. His point, however, is that this characteristic is applicable to language in general, to the proto-writing which makes speech possible, and not simply to the system of graphic representation which Lévi-Strauss introduced to the Nambikwara in "one leap." The following passage makes Derrida's own view extremely clear:

Distinguishing thus "the sociological" from the "intellectual end," attributing the former and not the latter to writing, one credits a very problematic difference between intersubjective relationship and knowledge. If it is true, as I in fact believe, that writing cannot be thought outside of the horizon of intersubjective violence, is there any thing, even science, that radically escapes it. Is there a knowledge, and, above all, a language, scientific or not, that one can call alien at once to writing and to violence? If one answers in the negative, as I do, the use of these concepts to discern the specific character of writing is not pertinent. So much so that all the examples by which Lévi-Strauss next illustrates this proposition are of course true and probing, but too much so. The conclusion that they sustain goes
far beyond the field of what is here called "writing" ('writing' in the usual sense). It also covers the field of unwritten speech. In other words, if writing is to be related to violence, writing appears well before writing in the narrow sense; already in the différence or the arche-writing that opens speech itself. 158

What one must see here is that the historical opposition between speech and writing which Derrida describes is an opposition between freedom and convention as much as an opposition between ontological certainty and indeterminancy. To read Derrida as the purveyor of a radical freedom which can ignore the bounds of culturally motivated linguistic parameters skews the Derridean argument and suggests the very romanticism to which Derrida is opposed.

Is it not clear, for example, that Derrida's derision of Rousseau is also based on the rejection of the possibility of absolute freedom?

The open air is undoubtedly Nature and in that respect it must lead Rousseau's thoughts in a thousand ways, through all the themes of pedagogy, promenade, botany, and so on. But more precisely, the open air is the element of the voice, the liberty of a breath that nothing breaks into pieces. A voice that can make itself heard in the open air is a free voice, a clear voice that the northern principle has not yet muzzled with consonants, not yet broken, articulated, compartmentalized, and which can reach the interlocutor immediately. The open air is frankness, the absence of evasions, of representative mediations among living spoken words. 159

Thus, if Derrida rejects Rousseau's attitude toward the possibility of the "open air," toward the liberty of the natural and living speech, he is also rejecting the opposition between freedom and convention, speech and writing, since in each pair the later term contaminates the former. The connection with science here is interesting. Derrida quotes from Rousseau's fragment on Pronunciation:
Languages are made to be spoken, writing serves only as supplement to speech; if there are some languages that are only written, and that one cannot speak, belonging only to the sciences, it would be of no use in civil life. Such is algebra, such was no doubt the universal language that Leibniz looked for. It would probably have been more useful to a Metaphysician than to an Artisan.\textsuperscript{160}

And offers the following restatement:

The universal characteristic, writing become purely conventional through having broken all links with the spoken language—such would be absolute evil.

The universal writing of science would thus be absolute alienation. The autonomy of the representor becomes absurd: it has attained its limit and broken with all representeds, with all living origin, with all living present.\textsuperscript{161}

It simply makes no sense at this point to interpret Derrida as arguing for the possibility of a radical free play, a freedom from a "writing become purely conventional."

These twin elements suggest why Derrida must grapple with the problem of "grammatology as a positive science" and why he chooses to "shake" the foundations of logocentric judgements rather than to destroy them. In its basic formulation, Derrida's argument is really rather simple: he wishes to point up the impossibility of arriving, through symbolic systems, at certitude and to point up the danger inherent in reifying any culturally based center of certainty. This, however, does not mean that he thinks it "possible simply to escape metaphysics"\textsuperscript{162} and the logocentric desire which metaphysics embraces.

Like the concept of the sign—and therefore of semiology—it [the concept of structure] can simultaneously confirm and shake logocentric and ethnocentric assuredness. It is not a question of junking these concepts, nor do we
have the means to do so. Doubtless it is more necessary, from within semiology, to transform concepts, to reinscribe them in other chains, and little by little to modify the terrain of our work and thereby produce new configurations . . . .

He also has a profound sense of "the encompassing power and the al-ready-thereness of the language or of the culture," and is quite honest about his inescapable dependence upon his own cultural and historical setting:

Psychoanalytic theory itself is for me a collection of tests belonging to my history and my culture. To that extent, if it marks my reading and the writing of my interpretation it does not do so as a principle or a truth that one could abstract from the textual system that I inhabit in order to illuminate it with complete neutrality. In a certain way, I am within the history of psychoanalysis as I am within Rousseau's text. Just as Rousseau drew upon a language that was already there—and which is found to be somewhat our own, thus assuring us a certain minimal readability of French literature—in the same way we operate today within a certain network of significations marked by psychoanalytic theory . . . .

Thus, if Derrida's insight into the linguistic system shows that there is always a "supplement at the origin," it also shows that the construction of origins is inescapable and, in fact, made possible by supplementarity. It is only in this way that his comment that "dif-ference produces what it forbids" makes sense.

This discovery about linguistic systems is exactly the same discovery made about symbolic representation in those theories of science explored in Chapter Three. When Derrida suggests that grammatology points to the "incompetence of science," he is suggesting that the science of grammatology refutes positivism, that grammatology is not
a "positive science." This is similar to the position taken by
Heisenberg and von Weizsacker, using quantum mechanics, and by Brono-
wski, using the mathematical theorems of Gödel. As was repeatedly
stressed in Chapter Three, one of the major facets of the arguments
in contemporary science is that absolute certainty is not possible (1)
because a detached objectifying view (what Derrida calls "neutrality")
is not possible, (2) because meaning undergoes "transformations" and
can never be static, and (3) because the axioms of symbolic systems
cannot help but be either incomplete or contradictory. Moreover,
Heisenberg's notion that language functions between the two poles of
"closed systems" and the "intrinsic uncertainty of the meaning of
words" as well as Bronowski's argument that all language use is in
touch with both that "penumbra of uncertainty," characteristic of an
"inner language," and the communicative fixities of meaning, character-
istic of an "outer," culturally ratified language, seem clearly to
parallel what has been referred to above as the two elements in the
Derridean argument. To emphasize either one of these two elements
is to lose sight of their interdependence. Borrowing Bronowski's
terms, it is clear that one must use the "outer," provisionally fixed
language in order to show the possibilities of the "inner" and ambigu-
ous language, but it is the "inner" language which allows the "outer"
language to exist at all. In Derridean terms, the distinction between
the "inside" and the "outside" collapses. Both are necessary for there
to be process, temporality, history, discovery. To rest with the
assurance that any logocentric version of truth is certain, absolute,
and verifiable is a dangerous error because language cannot give rise to such certainty. As Bronowski puts it, "the certain answers ironically are the wrong answers. Certainty is a demand that is made by philosophers who contemplate the world from the outside . . . ."\textsuperscript{167}

On the other hand, to feel that it is possible to capture the "force" which gives rise to expression and systematic structures without utilizing those structures is also a delusion, for, as Derrida says in "Force and Signification," force "can only be articulated in the language of form";\textsuperscript{168} the total "emancipation" from the language of form "is impossible unless we forget our history" which "would be meaningless and would deprive us of the light of meaning."\textsuperscript{169}

It may be recalled that it is on this basis that Bronowski argues for the "inseparable halves of the identity of man" and that science and literature are fundamentally similar, differing in degree but not in kind. It is necessary to see language as always operating between the two poles of culturally ratified, hierarchical systems of meaning and what both Bronowski and Derrida call "free play." To center one's attention on the former, to search for the final delineation of closed systems in the hope of enunciating some certain and absolute truth, as do Hirsch and Culler, has its place, but the impossibility of ever reaching this goal is determined by more than mere practical difficulties. To delineate a normative cultural \textit{langue} which is constitutive of meaning and the interpretive act is to ignore the ever-present possibilities for new meaningfulness, possibilities with which all sensitive explorers of symbolic understanding—whether in science or
poetry—are attuned. However, to center one's attention on some version of a radical linguistic free play is a presumptuous—and, ironically, perhaps an egocentric—act, a delusory attempt to escape one's sense of place and history. Meaning cannot be boxed in, but it cannot be reduced to the whirl of the textual abyss either.

The second element in the analogous relationship between scientific and literary theory also parallels this interdependence of culturally motivated perceptions of meaning and the inherent ambiguity of symbolic systems, but it more specifically concerns the role of the reader in the constitution of meaning. There is much in reader-response criticism that one must admire; it has provided an excellent antidote to the objectifying impulse to which formalism often succumbs. To bracket the reader's interpretive act, to argue that meaning inheres "ontologically" in the words on the page without a consideration of their actualization in the mind of the reader, ultimately leads to difficulties. It destroys the communicative link between past and future. Ironically enough, as was seen in Chapter Two, such literary theories are born in opposition to science only to end by embracing a positivism opposed by modern philosophies of science. There is, in fact, much in modern science which supports an emphasis on the subjective act of apprehending meaning which reader-response criticism endorses. The relativity of space and time, the realization in quantum mechanics that the observer and observed cannot be separated, the arguments put forth by Kuhn, Toulmin, Hanson, Bohm, Polanyi, etc. that "reality" is shaped by the theoretic constructs of a perceiver who is language- and culture-bound—all of these suggest an emphasis on
the subjective act of perception rather than the possibility of objectifiable verification and clearly support the impetus behind reader-response theories.

The problem with such theories, as was detailed in the last section, is that they lead to solipsism or give way to a rather static view of cultural norms which flirts—like formalism but in a different way—with objectivism. Typically, such theories, even if they begin with a reverence for the particular individual, ultimately do give way to the valorization of a literary langue. Even Fish must introduce the idea of "interpretive communities" in order to avoid entirely is-lating the individual consciousness. What must be more straight-forwardly realized, and then applied, is that the meanings which arise from a particular text are indeed made present by the presuppositions of the interpreter but that the presuppositions of the interpreter are also made possible by the elements of the particular text and the larger systems and sub-systems of intertextuality. Moreover, it is quite possible (in fact, in literature it is often the case) that the presuppositions one brings to a text and which are then supported by the elements of the text-as-read never exhaust the potential meanings of the text. This notion (1) that the presuppositions of a theory are necessary for data to exist at all, (2) that data are used in support of the theory, (3) that theories are at least partially determined by scientific acculturation, and (4) that the wealth of data never completely conforms to whatever presuppositional stance is utilized—this notion is of central importance to those philosophies
of scientific discovery which were explored in Chapter Three. There it was suggested that the theories of Hanson, Kuhn, Toulmin, and Polanyi echo the hermeneutic circle where parts are discoverable only by apprehension of the whole while the whole is determined by the parts. To this one might add Heisenberg's notion of reality as a "potentia" which is then actualized by the subjective apprehension of individual perception. Together these combine to produce a theory of interpretation which gives credit to cultural determinants but also to interpretive possibilities.

There is in literary hermeneutics already a theory which is much like these aspects of scientific theory. Although Heidegger rejects science as a calculative enterprise because it operates by derivative assertion and is out of touch with the understanding of Being, his hermeneutical ontology is, in fact, quite similar to the philosophies of scientific discovery outlined in Chapter Three. In section thirty-two of Being and Time, for example, Heidegger argues that interpretation is of necessity founded on presuppositions. "An interpretation," he writes, "is never a presuppositionless apprehending of something presented to us."175 How similar to N. R. Hanson's argument that seeing is always a "seeing as" the following passages sound:

That which is understood gets articulated when the entity to be understood is brought close interpretatively by taking as our clue the 'something as something' . . . .176

In interpreting, we do not, so to speak, throw a 'signification' over some naked thing which is present-at-hand, we do not stick a value on it; but when something within-the-world is encountered as such, the thing in question already has an involvement which is disclosed in our understanding
of the world, and this involvement is one which gets laid out by the interpretation.\(^{177}\) Heidegger's notion that meaning "gets its structure from a fore-having, fore-sight, and fore-conception\(^{178}\) parallels Stephen Toulmin's terminology. The argument that interpretation is always grounded in Dasein's Being-in-the-world is also similar to Kuhn's notion of paradigm as well as the emphasis upon world-views present in all of the theses of the "new philosophers of science." And Heidegger's increasing interest in the equation between language and Being is perhaps most clearly reflected in Polanyi's belief that man "dwells in language as he does in his own body,"\(^{179}\) but this realization that language embodies both culturally determined meanings and possibilities for new meanings, thus urging man to reinterpret continually, is a realization emphasized by almost every scientist and philosopher of science whose work was analyzed in Chapter Three.

For Heidegger the work of art is not "an object which is simply there.\(^{180}\) It is not "an object that is supposed to produce this or that state of mind.\(^{181}\) It calls man into the interpretative act within which the understanding of Being takes place. And this understanding of Being, a dynamic coming-to-be, is one with the "happening of truth." For Heidegger, "truth does not exist in itself beforehand, somewhere among the stars, only later to descend among being."\(^{182}\) Truth "happens in the work-being of the work\(^{183}\) and this involves the simultaneous concealment and un concealing of the inexhaustible Being.
The nature of truth, that is, of unconcealedness, is dominated throughout by a denial. Yet this denial is not a defect or a fault, as though truth were an unalloyed unconcealedness that has rid itself of everything concealed. If truth could accomplish this, it would no longer be itself. This denial, in the form of a double concealment, belongs to the nature of truth as unconcealedness.184

This then is a hermeneutical ontology where "things" call for interpretation, and interpretation calls things to their being. The act of Being, thus, can never be finalized, nor can interpretation. The emphasis is on possibilities:

As understanding, Dasein projects its Being upon possibilities: This Being-towards-possibilities which understands is itself a potentiality-for-Being, and it is so because of the way these possibilities, as disclosed, exert their counter-thrust upon Dasein. The projecting of the understanding has its own possibility—that of developing itself. This development of the understanding we call "interpretation."185

Nor is interpretation the acquiring of information about what is understood; it is rather the working-out of possibilities projected in understanding.186

Heidegger recognizes the impossibility of coming to a text without prejudice and predetermination. This is in many respects analogous to the thesis of reader-response criticism. However, for Heidegger, as well as for modern philosophy of science, meaning is not collapsable into the subjective act of apprehension for this would maintain the subject-object dichotomy. Rather, the understanding upon which interpretation is based is the coming together of the fore-structure one brings to the text with the text itself.

To be sure, we genuinely take hold of this possibility only when, in our interpretation, we have understood that our first, last, and
constant task is never to allow our fore-having, fore-sight, and fore-conception to be presented to us by fancies and popular conceptions, but rather to make the scientific theme secure by working out these fore-structures in terms of the things themselves.\textsuperscript{187}

The "circle of understanding" which this process of interpretation implies "is not an orbit in which any random kind of knowledge may move . . . ."\textsuperscript{188} This circle, moreover, is not a "circulus vitiosus," for "if we see this circle as a vicious one and look out for ways of avoiding it, even if we just 'sense' it is an inevitable imperfection, then the act of understanding has been misunderstood from the ground up."\textsuperscript{189} For Heidegger, the presuppositions that one brings are constituted by one's own Being-in-the-world and this inevitably involves one's historical time and place; however, \textit{Dasein} is also and always a Being-toward-possibilities which means that the presuppositions, themselves necessary to the interpretive act, are always only partial and allow an encounter with Being, always concealed in its process of unconcealing, to which man belongs.

Heidegger's version of the hermeneutic circle is exactly parallel to the thesis that scientific discovery is made possible by the scientific culture to which one belongs. Scientific theories, fore-structured by scientific communities, allow data to arise. And when the facts support the theory, the theory is accepted according to the inter-subjective values of the scientific community. But theories also give rise to anomalies which in turn challenge those theories and lead, in the future, to new formulations. Thus, just as Heidegger
emphasizes, man questions whatever he chooses to interpret and the questions asked cause particular aspects to appear. But this act of questioning also brings man in contact with Being which, in turn, questions man. It is through this reciprocal process that meaning, a nexical interaction of subject and object, arises. Moreover, it is important to remember that whatever fore-structures one may have, they do not come out of the blue but are the product of previous acts of interpretation whereby Dasein or Being-in-the-world is articulated.

Hans-Georg Gadamer has continued this same line of development in hermeneutics which Heidegger initiated, and in some ways, as Richard Palmer notes, Gadamer's "dislectical hermeneutics" is "probably an improvement over Heidegger's conception" because there is a "tendency in later Heidegger to describe understanding exclusively with a vocabulary of passive terms . . . ." To say, for example, that "language speaks" seems to remove man from an active and personal participation. The differences between Gadamer and Heidegger, however, may really be more ones of style than substance, for it is Heidegger's intention to suggest that through language man participates in Being by becoming in-the-world. In any case, the ontological power of language is recognized by Gadamer also. In *Truth and Method* Gadamer urges the reader to see that language is not just one of man's possessions in the world, but on it depends the fact that man has a world at all. For man the world exists as world in a way that no other being in the world experiences. But this world is linguistic in nature.
And Gadamer also recognizes the impossibility of approaching the text without preconceptions and "prejudice."

When Heidegger showed that what we call the 'reading of what is there' is the fore-structure of understanding, this was, phenomenologically, completely correct.¹⁹²

Every age has to understand a transmitted text in its own way, for the text is part of the whole of the tradition in which the age takes an objective interest and in which it seeks to understand itself. The real meaning of a text, as it speaks to the interpreter, does not depend on the contingencies of the author and whom he originally wrote for. It certainly is not identical with them, for it is always partly determined also by the historical situation of the interpreter . . . .¹⁹³

But if understanding "is not merely a reproductive, but always a productive attitude as well,"¹⁹⁴ this does not mean that interpretation is nothing other than the reiteration of one's anticipations before interacting with the text. Gadamer also emphasizes that interpretation must always attune itself to the meaningful possibilities which language offers. In fact, "the discovery of the true meaning of a text or a work of art is never finished: it is . . . an infinite process."¹⁹⁵

Historical tradition can be understood only by being considered in its further determinations resulting from the progress of events. Similarly, the literary critic, who is dealing with poetic or philosophical texts, knows that they are inexhaustible. In both cases it is the progress of events that brings out new aspects of meaning in historical material.¹⁹⁶

It is part of the historical finiteness of our being that we are aware that after us others will understand in a different way.¹⁹⁷

For Gadamer interpretation is a "conversation with the text."¹⁹⁸

Not only is the text opened up by the "horizons" of potential meaning
that the interpreter brings, but the "voice that speaks to us from the past--be it text, work, trace--itself poses a question and places our meaning in openness." 199 This points to the third element in the analogous relationship between theories of scientific discovery and literary hermeneutics. For Gadamer understanding and interpretation are always historically constituted. The "event" of interpretation "means the coming into play, the working itself out, of the context of tradition in its constantly new possibilities of significance and resonance, newly extended by the other person receiving it." 200

The first thing is the question that the text presents us with, our response to the word handed down to us, so that its understanding must already include the work of historical self-mediation of present and tradition. 201

Thus, the meaning of a text resides in its possibilities for meaningfulness in the future. These possibilities will depend upon the presuppositions which are brought to the text. But these presuppositions, defined by the cultural constructs of a particular historical period, are also part of a living tradition which brings the questions of the past into the reformulations of the future.

This is in many respects similar to the roles which tradition and history play in those philosophies of science broached in Chapter Three. The value of scientific theories depends upon the possibility that they will be passed on, within the scientific tradition, to be reinterpreted in the future. The meaning of scientific terms and formulae are not fixed; theories continually invite reinterpretation, and although meaning is partially determined by the world-view of a
particular scientific community, different world-views arise within the continuity of a tradition. One cannot isolate the past from the present, for the present is dependent upon the presuppositions handed down from the past. Moreover, the movement of this tradition resides in the intrinsic power of language. Words, as Polanyi describes them for example, are not only "conventions, established for the sake of convenient communication." They bind a living tradition together by calling attention to the possibilities for new meaning, which allows for change and discovery.

These ideas have been shown to be of great importance to modern science and theories of scientific discovery. They are also clearly of great significance to any theory of literary interpretation and do not violate a Derridean-oriented theory of literary hermeneutics. First, language always embodies two poles: provisionally fixed centers of meaning determined by an historically situated, cultural langue and an inescapable "free play" where words turn on one another and refuse to allow a static certainty. Second, it is impossible to isolate the world and its objects from the perceptions of a subjective consciousness. Conversely, there is no pure consciousness sufficient unto itself. Third, man and meaning are historical; in other words, they belong to a history which always projects itself toward the possibilities of meaningfulness which are held in the future.

This means that the question of authority is not answered by any one of the three logical possibilities which are valorized by different literary theories. To focus one's attention on a fixed meaning which
is "historically" constituted by the cultural horizons of an author

denies the right of an author to explore the possibilities for new
meaning which words, despite all attempts to the contrary, always offer.
It denies the author his role in a living tradition for it trivializes
the communicative link of past and present. Interpretation is always
more than the attempt to discover some lost and fixed past meaning,
for the meaning of the past is always dependent upon the choices of
the present. There is, moreover, no neutral observer; objective
interpretation is an unfortunate illusion. To focus one's attention
on the language of the text has the advantage of allowing for a concen-
tration on the power of language, but it leads, in its formalist variety,
to a deadening and objectifying impulse despite its initial desire to
avoid objectivism. In its newer post-structuralist variety, a text-
centered poetics obscures the meaningfulness which a text must have
(and, in fact, always does have) for the interpreter who is culturally
and historically situated. Both versions displace the reader from the
interpretive role constitutive of meaning. Thus, they too destroy the
communicative link of past and present, as does reader-response critic-
ism which collapses all distinctions into the subjective perception of
the individual perceiver or the cultural and literary norms which he
inherits, leaving no room for discovery and change. Meaning and
interpretation must be seen as a transactive process involving a pro-
ductive interdependence between author, text, and reader. This is,
in fact, what modern science teaches.
END NOTES


2 Fish used this phrase in a panel discussion on poetics at Rice University, Spring, 1979.


13 Ibid., p. 58.

14 Ibid., p. 55.
15 Ibid., p. 58.


17 Ibid., p. 473

18 Lentricchia, After the New Criticism, p. 178.


20 Ibid., p. 151.


23 Ibid. p. 198.


26 Ibid., p. 200.

27 Ibid., p. 203.

28 Ibid., p. 204.


30 Ibid., p. 280.

31 Ibid., p. 290.

32 Ibid., p. 300.

33 Ibid., p. 301.
34 Ibid., p. 301.

35 Ibid., p. 300.


37 Ibid., p. 179.


39 Ibid., p. 173.

40 Ibid., p. 173.

41 Krieger often used this phrase in a colloquium on poetics at Rice University, March, 1981. See also Theory of Criticism.


43 Lentricchia, After the New Criticism, p. 237.


45 Lentricchia, After the New Criticism, p. 239.


49 Krieger, Theory of Criticism, p. 213.

50 See Krieger, Theory of Criticism, particularly p. 188.


52 Ibid., p. 180.
53. Ibid., p. 179.


56. Ibid., p. 614.

57. Ibid., p. 611.


61. Ibid., p. 31.


63. Ibid., p. 12.

64. Ibid., p. 12.


66. Ibid., p. 335.

67. Ibid., p. 346.

68. Ibid., p. 333.

69. Ibid., p. 333.

70. Ibid., p. 338.

72 Ibid., p. 343.
73 Miller, "Deconstructing the Deconstructors," p. 29.
74 Ibid., p. 28.
75 Ibid., p. 24.
76 Ibid., p. 25.
79 Ibid., p. 10.
81 Ibid., p. 20.
83 Paul de Man, "Form and Intent in the American New Criticism," in Blindness and Insight, p. 27.
84 Paul de Man, "Semiology and Rhetoric," p. 139.
85 Paul de Man, "Criticism and Crisis," p. 17.
87 de Man, "The Rhetoric of Blindness," Blindness and Insight, p. 111.
88 Ibid., p. 119.
89 de Man, "Genesis and Genealogy," p. 83.

91 Ibid., p. 140.


93 Ibid., p. 107.

94 Ibid., p. 107.

95 Ibid., p. 110.

96 de Man, "Semiology and Rhetoric," p. 137.

97 de Man, "Semiology and Rhetoric," pp. 138-139.


99 Ibid., p. 18.


101 Ibid., p. 122.


103 Ibid., p. 99.

104 Ibid., pp. 98-99.


106 Ibid., p. 224.


108 Ibid., p. 184.
109 Ibid., p. 181.

110 Ibid., p. 181.

111 Ibid., p. 183.

112 Ibid., p. 182.

113 Ibid., p. 183.

114 Ibid., p. 182.


116 Ibid., p. 127.

117 Ibid., p. 131.

118 Ibid., p. 124.

119 Ibid., p. 123.

120 Ibid., p. 125.

121 Ibid., p. 125.


123 Ibid., p. 32.

124 Ibid., p. 32.


Ibid., p. 83.

Ibid., p. 83.

Ibid., p. 87.

Ibid., p. 93.

Ibid., p. 93.


Ibid., p. 177.


Ibid., p. 142.

Ibid., p. 146.

Ibid., p. 147.


Ibid., p. 163.

Ibid., p. 163.

Ibid., p. 163.

Lentricchia, *After the New Criticism*, p. 175.


146 Derrida, "Differance," p. 141.


152 Ibid., p. 16.

153 Lentricchia, *After the New Criticism*, p. 175.


155 Ibid., p. 37.

156 Ibid., p. 117.

157 Ibid., p. 119.

158 Ibid., p. 127.

159 Ibid., p. 308.


163 Ibid., p. 24.

Ibid., p. 160.

Ibid., p. 143.


Ibid., p. 28.


Ibid., p. 190.

Ibid., p. 190-191.

Ibid., p. 193.

Michael Polanyi, Personal Knowledge (Chicago, 1958), p. 60.


Ibid., p. 69.

Ibid., p. 61.

Ibid., p. 55.

Ibid., pp. 54-55.

Heidegger, Being and Time, p. 188.

Ibid., pp. 188-189.

Ibid., p. 195.

Ibid., p. 195.

Ibid., p. 194.


CHAPTER FIVE:  AFTERWARD

Why, for example, has the treatment and interpretation of the poets for years been so dreary in our higher schools? Answer: Because the teachers do not know the difference between a thing and a poem; because they treat poems as things, which they do because they have never gone through the question of what a thing is.  

—Heidegger

At the Fall, 1980, meeting of the MLA there was a section entitled "Deconstructive Criticism: Directions." It was an interesting meeting. The room was overflowing with enthusiastic deconstructors. The program consisted of a paper, "Nothing Fails Like Success," delivered by Barbara Johnson with responses by Joseph Riddel ("What is Deconstruction, and Why Are They Writing All Those Graff-ic Things About It?"), and William Spanos ("Retrieving Heidegger's De-Struction"). Ms. Johnson's thesis encouraged the reader always to develop an attitude which would be "surprised" by a text. She was clearly arguing against fixities, stasis, and certainty, but the little word "always" caused her some problems. The discussion following the papers focused, for the most part, on whether one actually could be surprised if one had predetermined that surprise was the privileged reaction to cultivate. Basically, the discussion explored a variation of the logical difficulty inherent in arguing that there are absolutely no absolutes.

Besides the discussion, however, there was another interesting occurrence. After the panelists had delivered their papers, a man stood to ask a question. One could only assume that he was from the academic hinterlands, as no one seemed to recognize him and he referred
to everyone with formal appellations. His question also suggested 
that he was not in the thick of deconstructive thought. He prefaced 
his question by stating that he taught at such and such university and 
lately had been hearing a lot about deconstructive and post-structural-
ist ideas; when he saw the section on "directions" in "deconstructive 
criticism" in the MLA program, he planned to attend to see if he could 
learn more about these ideas. He confessed that he had listened to the 
papers with interest but had had difficulty following the train of 
thought at times. He wondered if someone could perhaps give him a 
brief description of deconstructive theory. He was particularly struck 
by the repeated suggestions that deconstructive criticism was new, but 
he could find little which did not correspond to the theory of litera-
ture that he already espoused. Raised in the New Critical tradition, 
he too felt that there was no such thing as the correct reading of 
a text, that language was dynamic, and that surprise always waited for 
those open to new possibilities in literature.

The rebuff that he received was itself surprising. It was also 
somewhat embarrassing. To be sure, it would be difficult to offer a 
two or three minute encapsulation of post-structuralist theory and the 
audience would rightly be concerned that the small amount of time 
devoted to discussion could be usurped by the instruction of a neophyte. 
Still, both parts of his question had merit; at least, the question 
deserved more serious attention than it received. Among the panelists 
only William Spanos treated it as a sincere and legitimate question 
deserving an honest response. More significant, however, was the 
reaction of the audience. One could only characterize it as open
derision. A buzz of whispers and unmuffled laughter followed him; several angry statements were voiced from the audience. Clearly, the questioner was made to feel that he didn't belong, that perhaps he had mistakenly wandered in the wrong door and would feel more comfortable in the section on satire in the adjacent room. He was not one of the anointed.

Such a situation is disturbing for a variety of reasons. First, the relationship between post-structuralism and the New Criticism is an important one; as this dissertation has tried to show in several places, New Critical and post-structuralist theories are not as opposed to one another as many would like to make them. At the very least the questioner had a legitimate point, and it was disconcerting to see this issue rejected out of hand as a foolish and unsophisticated confession. Second, and more importantly, it was disappointing that some note of self-conscious irony was not expressed. After all, the issue on the agenda was the difficulty of maintaining a certain uncertainty. There was clearly an anxiety expressed by the more knowledgeable deconstructive enthusiasts present that post-structuralist literary theory may be turning into a crystalized methodology, complete with rules of procedure and defined goals. This anxiety, one might guess, was partly responsible for Ms. Johnson's veneration of surprise. In any case, it is ironic when a theoretically egalitarian and tolerant group closes its ranks against an "outsider" in order to suggest that certain "truth" is the province of a privilege sect.

Third, and even more disturbing, is the way in which this occurrence illustrates a general tendency in literary studies to isolate
literature from its potential relationship to other disciplines or to ideas which, it is feared, may contaminate its significance. One suspects that the causes for this are more sociological than philosophical. The value of literary studies seems always under attack, and perhaps it is only natural that theories which venerate literature are cherished partly because they provide a bulwark against the intellectual philistine. Nevertheless, the defensive posture often turns into an offensive attack on any and all who are not adherents to whatever theory is currently dominant. There is a good bit of evidence to suggest that this is becoming the case with deconstructive theory.

Historically, it has been convenient to define literature in isolation from, and opposition to, science. This too is probably partially the result of sociological factors as the two disciplines have vied for financial appropriations and academic support in educational institutions. Whatever the reasons, however, this increasingly self-imposed division has resulted in an unfortunate irony not dissimilar to that which occurred in that MLA meeting. The aesthetic autotelism of formalist theories may relieve literature from the threat of a verifiable science, but it simultaneously makes the literary text into an object which must be viewed, and analyzed, in a certain way. In thus carving out its unique object for study, formalism may actually emulate the very scientific methodology that it rejects. There are suggestions that the same may be happening with post-structuralist theory. Both theories, for example, have a tendency to remove literature from the meaningful needs of a reader who is concerned with his own historical and cultural
setting. Despite the valorization of freedom and metonymic development, there is an air of certitude present in deconstructive poetics which suggests that the text must be seen as a particular kind of linguistic object, separable from the actualization of a reader. Strangely enough, the success of a post-structuralist poetics may, in the name of temporality and uncertainty, cultivate a priestly caste which alone is capable of knowing with certainty what literature is about. This too is done in the name of a higher truth, beyond the fixities of science. There is, in fact, a milieu of intolerance in literary polemics today.

There is much that contemporary literary theory might learn by accepting science as a colleague in the search to discover the nature of meaning and significance. Science, as Bronowski continually argued, must encourage a "tolerant" attitude. Above all, science points to the dangers inherent in accepting the text as a thing isolable from the concrete meaningfulness it imparts.