The Alternative Paradigm Dialog

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It is not surprising that most persons asked to define the term paradigm are unable to offer any clear statement of its meaning. I say it is not surprising because Thomas Kuhn, the person most responsible for bringing that concept into our collective awareness, has himself used the term in no fewer than 21 different ways, if Masterman (1970) can be believed. Some persons view that lack of clear definition as an unfortunate state of affairs, but I believe that it is important to leave the term in such a problematic limbo, because it is then possible to reshape it as our understanding of its many implications improves. Having the term not cast in stone is intellectually useful. Thus I will use the term in this chapter only in its most common or generic sense: a basic set of beliefs that guides action, whether of the everyday garden variety or action taken in connection with a disciplined inquiry. Refinement of that definition can be made by each reader while progressing through the book.

In this opening chapter I propose to outline what I take to be the salient differences between traditional positivism, on the one hand, and the three paradigms that have emerged to challenge (replace? parallel?) it on the other. Of course, I have my own preference among them; it would be remiss of me not to acknowledge that preference at once. It is constructivism. One immediate consequence is that I recognize that what I am about to say is my own construction, not necessarily an objective (whatever that may be) analysis. Indeed, as we shall see, constructivists not only abjure objectivity but celebrate subjectivity. The reader should not, therefore, read this chapter in the mistaken notion that it represents gospel or even a widely agreed to position. I
Generating Inquiry Paradigms

There are many paradigms that we use in guiding our actions: the adversarial paradigm, the legal system, the judicial, the religious, the educational, the political, the economic, the biological, the physical, the psychological, and so on. Each of these paradigms has its own strengths and weaknesses, and each is useful in certain situations. The key is to recognize that these paradigms are not mutually exclusive, and that they can be used together in a complementary fashion. As a result, I will not reject any paradigm out of hand, as it is important to consider all possible approaches to a problem.

The Basic Beliefs of Positivism

The basic beliefs of positivism are

1. The world is a collection of objects and events that can be observed and measured.
2. Knowledge is gained by observing and measuring these objects and events.
3. The goal of science is to discover the nature of the objects and events that we observe.
4. The goal of society is to use this knowledge to improve the quality of life for all people.

The positivist approach to inquiry can be summarized as follows:

1. **Observation:** The first step in the positivist approach is to observe the world around us. This involves collecting data and information from a variety of sources.
2. **Measurement:** The next step is to measure the data and information that we have collected. This involves using a variety of tools and techniques to quantify the information.
3. **Analysis:** Once the data has been collected and measured, it is then analyzed to determine the relationships between the variables.
4. **Conclusion:** Finally, the results of the analysis are used to draw conclusions about the world around us.

The positivist approach to inquiry is a powerful tool for understanding the world around us. However, it is important to recognize that it is not the only approach to inquiry, and that it has its own strengths and weaknesses.

The answers to given these questions may be different, as the basic beliefs and paradigms are different. The legal system is a different paradigm, and the educational system is a different paradigm. The basic beliefs of each paradigm are different, and the paradigms are not mutually exclusive.
The basic belief system (paradigm) of conventional (positivist) inquiry can thus be summarized as follows:

**Ontology:** Realist—reality exists "out there" and is driven by immutable natural laws and mechanisms. Knowledge of these entities, laws, and mechanisms is conceptually summarized in the form of time- and context-free generalizations. Some of these latter generalizations take the form of cause-effect laws.

**Epistemology:** Dualist/objectivist—it is both possible and essential for the inquirer to adopt a distant, noninteractive posture. Values and other contextual factors are thereby automatically excluded from influencing the outcomes.

**Methodology:** Experimental/manipulative—questions and/or hypotheses are stated in advance in propositional form and subjected to empirical tests ( falsification) under carefully controlled conditions.

There are many ways in which this belief system can be undermined. Each of the three emergent paradigms raises its own objections and proposes its own solutions. I will examine each in turn.

**The Basic Beliefs of Postpositivism**

Postpositivism is best characterized as a modified version of positivism. Having assessed the damage that positivism has incurred, postpositivists struggle to limit that damage as well as to adjust to it. Prediction and control continue to be the aim.

**Ontologically,** postpositivism moves from what is now recognized as a "naive" realist posture to one often termed critical realism. The essence of this position is that, although a real world driven by real natural causes exists, it is impossible for humans truly to perceive it with their imperfect sensory and intellectual mechanisms (Cook & Campbell, 1979, p. 29). Inquirers need to be critical about their work precisely because of those human failings. But, although one can never be sure that ultimate truth has been uncovered, there can be no doubt that reality is "out there." Realism remains the central concept.

**Epistemologically,** postpositivism recognizes the absurdity of assuming that it is possible for a human inquirer to step outside the pale of humanness while conducting inquiry. Work in the "hard" sciences has aptly demonstrated that "findings" emerge from the interaction of inquirer and inquired into, as shown by, say, the Heisenberg Uncertainty Principle and the Bohr Complementarity Principle (Hesse, 1980; Zuck, 1979). To overcome these problems postpositivists counsel a modified objectivity, hewing to objectivity as a "regulatory ideal" but recognizing that it cannot be achieved in any absolute sense. It can be achieved reasonably closely, by striving to be as neutral as possible; by "coming clean" about one's own predispositions (as did I in the early paragraphs of this chapter) so that the reader can make whatever adjustments to the proffered interpretations of findings that seem appropriate; by relying on "critical tradition," that is, requiring the reports of any inquiry to be consistent with the existing scholarly tradition of the field; and by subjecting every inquiry to the judgment of peers in the "critical community," that is, the editors and referees of journals as well as their readers. Of course, the latter two requirements also make it virtually impossible for new paradigms to assert themselves, an advantage not lost on the power brokers who protect and defend the (new) hegemony of postpositivism.

**Methodologically,** postpositivism provides two responses to emergent challenges. First, in the interest of conforming to the commitment to critical realism and modified objectivity, emphasis is placed on critical multiplication (Cook, 1985), which might most usefully be thought of as a form of elaborated triangulation (Denzin, 1978). If human sensory and intellectual mechanisms cannot be relied upon, it is essential that the "findings" of an inquiry be based on as many sources—of data, investigators, theories, and methods—as possible. Further, if objectivity can never be entirely attained, relying on many different sources makes it less likely that distorted interpretations will be made.

Second, and perhaps more important, postpositivism recognizes that many imbalances have been allowed to emerge in the zeal for achieving realistic, objective inquiry. A major part of the postpositivist agenda has been devoted to identifying these imbalances and proposing ways of redressing them. It is believed that, if they can be redressed, positivism, in its new postpositivist clothes, can be made useful once again. There are four imbalances; of course, not all postpositivists would agree that all exist and certainly not that they are equally critical.

1. The imbalance between rigor and relevance. In more traditional terms this is the inescapable trade-off between internal and external validity. The greater the control established to achieve internal validity, the less the generalizability of the findings, for, in the final analysis,
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of science only for verifiers. This imbalance is redressed by defining a continuous of inquiry, which ranges from "pure" discovery at one end to "pure" verification at the other. The reader should note that the earlier tendency to relegate paradigms other than positivist inquiry to the discovery end has been replaced with a more ecumenical stance that seems to recognize that both processes can go on in all paradigms. But it should be clear that making this adjustment has nothing to do with paradigm differences; it simply recognizes that positivism, if not postpositivism, made an error in its earlier assessment.

We may note then that the basic belief system of postpositivism differs very little from that of positivism. We may summarize the stances as follows:

Ontology: Critical realist—reality exists but can never be fully apprehended. It is driven by natural laws that can be only incompletely understood.

Epistemology: Modified objectivist—objectivity remains a regulatory ideal, but it can only be approximated, with special emphasis placed on external guarantors such as the critical tradition and the critical community.

Methodology: Modified experimental-manipulative—emphasizes critical multiplicity. Redress imbalances by doing inquiry in more natural settings, using more qualitative methods, depending more on grounded theory, and reintroducing discovery into the inquiry process.

The Basic Beliefs of Critical Theory

The label critical theory is no doubt inadequate to encompass all the alternatives that can be swept into this category of paradigm. A more appropriate label would be "ideologically oriented inquiry," including neo-Marxism, materialism, feminism, anti-racism, participatory inquiry, and other similar movements as well as critical theory itself. These perspectives are properly placed together, however, because they converge in rejecting the claim of value freedom made by positivists (and larger continuing to be made by postpositivists).

Because they are human constructions, paradigms inevitably reflect the values of their human constructors. They enter into inquiry at choice points such as the problem selected for study, the paradigm within which to study it, the instruments and the analytic modes used, and the interpretations, conclusions, and recommendations made.
Nature cannot be seen as it “really is” or “really works” except through a value window.

If values do enter into every inquiry, then the question immediately arises as to what values and whose values shall govern. If the findings of studies can vary depending on the values chosen, then the choice of a particular value system tends to empower and enfranchise certain persons while disempowering and disenfranchising others. Inquiry thereby becomes a political act.

Given that counterclaim, one might expect critical theorists (ideologists) to reject a realist posture. For if there is a real state of affairs, then it seems unreasonable to argue that value positions that inquirers might take as true. Moreover, a real reality requires an objective epistemological approach to uncover it—as positivists and postpositivists have claimed all along. But, for whatever reason, critical theorists (ideologists) have elected to believe in an objective reality—as the phrase commonly used by them, “false consciousness,” readily demonstrates (because it implies that there is a “true consciousness” somewhere “out there,” or, more likely, possessed by the inquirer or some better-informed elite). The task of inquiry is, by definition, to raise people (the oppressed) to a level of “true consciousness.” Once they appreciate how oppressed they are, they can act to transform the world. The close parallel between transforming the world and predicting and controlling it should not be lost.

Thus there appears to be a logical disjunction: a realist (but probably with the postpositivists, a critical realist) ontology coupled with a subjectivist epistemology—subjectivist because inquiry acts are intimately related to the values of the inquirer. The move to a subjectivist epistemology no doubt represents a forward step, but, so long as that epistemology is enlisted in the service of a realist ontology, it seems to lose much of its force.

At the methodological level, critical theorists (ideologists) seem more consistent. If the aim of inquiry is to transform the real world by raising the consciousness of participants so that they are energized and facilitated toward transformation, then something other than a manipulative, interventionist methodology is required. Critical theorists (ideologists) take a dialogic approach that seeks to eliminate false consciousness and rally participants around a common (true?) point of view. In this process, features of the real world are apprehended and judgments are made about which of them can be altered. The result of effective, concerted action is transformation.

The Basic Beliefs of Constructivism

It is my belief that proponents of both the postpositivist and the critical theory (ideological) paradigms feel that there can be an accommodation between their positions and, indeed, with conventional positivism. Constructivists, on the other hand, feel that the positivist (and postpositivist) paradigms are internally flawed and must be entirely replaced. Among the more telling arguments are these (Guha & Lincoln, 1989; Lincoln & Guha, 1985):

1. The theory ladenness of facts. If empirical tests are to be valid as arbiters of propositions (hypotheses and questions) put to nature by inquirers, then it is essential that theoretical and observational languages be independent. The “facts” that are collected must be independent from the propositional (theoretical) statements. But philosophers of science now uniformly believe that facts are facts only within some theoretical framework (Hesse, 1980). Thus the basis for discovering “how things really are” and “really work” is lost. “Reality” exists only in the context of a mental framework (construct) for thinking about it.

2. The underdetermination of theory. No theory can ever be fully tested because of the problem of induction. Observing one million white swans does not provide indisputable evidence for the assertion, “All swans are white.” There are always a large number of theories that can, in principle, explain “a given body of facts.” Thus no unequivocal explanation is ever possible. There can be many constructions, and there is no foundational way to choose among them. “Reality” can be “seen” only through a window of theory, whether implicit or explicit.

3. The value ladenness of facts. Constructivists concur with the ideological argument that inquiry cannot be value free. If “reality” can be seen only through a theory window, it can equally be seen through a value window. Many constructions are possible.
(4) The interactive nature of the inquirer inquiry into itself. Even post-positive.

positivists have conceded that objectivity is not possible; the results of an inquiry are always shaped by the interaction of inquirer and investigated. There is no Archimedean point. And if there is such an intimate interconnectedness in the physical sciences, how much more likely is it that the results of social inquiry are similarly shaped? This problem of interaction is devastating to both positivism and post-

positivism. First, it renders the distinction between ontology and epistemology obsolete: what can be known and the individual who comes to know it are fused into a coherent whole. Further, it makes the findings of an inquiry not a report of what is "out there" but the residue of a process that literally creates them. Finally, it depicts knowledge as the outcome or consequence of human activity; knowledge is a human construction, never certifiable as ultimately true but problematic and ever changing.

Given this critique, it is apparent why constructivists feel that an entirely new paradigm is needed. Ontologically, if there are always many interpretations that can be made in any inquiry, and if there is no foundational process by which the ultimate truth or falsity of these several constructions can be determined, there is no alternative but to take a position of relativism. Relativism is the key to openness and the continuing search for ever more informed and sophisticated constructions. Realities are multiple, and they exist in people's minds.

Epistemologically, the constructivist chooses to take a subjectivist position. Subjectivity is not only forced on us by the human condition (as the positivist might admit) but because it is the only means of unlocking the constructions held by individuals. If realities exist only in respondents' minds, subjective interaction seems to be the only way to access them.

Methodologically, the constructivist proceeds in ways that aim to identify the variety of constructions that exist and bring them into as much consensus as possible. This process has two aspects: hermeneutics and dialectics. The hermeneutic aspect consists in depicting individual constructions as accurately as possible, while the dialectic aspect consists of comparing and contrasting these existing individual (including the inquirer's) constructions so that each respondent must be among the constructions of others and come to terms with them. The hermeneutic/dialectic methodology aims to produce an informed and sophisticated construction (or, more likely, constructions) as possible. Simultaneously the methodology aims to keep

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channels of communication open so that information and sophistication can be continuously improved. Constructivism thus intends neither to predict and control the "real" world nor to transform it but to reconfigure the "world" at the point at which it exists: in the minds of constructors. It is the mind that is to be transformed, not the "real" world.

We may thus summarize the constructivist belief system as follows (retaining the threefold organization for the sake of contrast despite having argued that, in constructivism, the ontology/epistemology distinction is obliterated):

Ontology: Relativity—reality exist in the form of multiple mental constructions, socially and experientially based, local and specific, dependent for their form and content on the persons who hold them.

Epistemology: Subjectivity—inquirer and inquired into are fused into a single (monistic) entity. Findings are literally the creation of the process of interaction between the two.

Methodology: Hermeneutic, dialectic—individual constructions are elicited and refined hermeneutically, and compared and contrasted dialectically, with the aim of generating one (or a few) constructions on which there is substantial consensus.
Points of View

Part II Points of View sets the stage for the dialog that follows in the remainder of the book. Four papers are included: the three keynote addresses and the dinner address.

Denis Phillips sets out the proposition that the key to understanding the contemporary state of affairs lies in an assessment of the historical framework within which they have evolved. Following this, he outlines the fundamental principles underlying the critical position and follows with six questions that, he believes spell out the implications of that position. In his reply, Yeonan Kim presents an alternative viewpoint, focusing on the importance of maintaining the historical perspective. Eliott Eiser's address did not come at the point which he believes is its implicaions for selected problem areas.

This volume, as part of the plenary sessions devoted to making a paradigm shift and it creates a splendid context for what follows.
Postpositivistic Science

Myths and Realities

DENIS C. PHILLIPS

It is arguable that recent advances in the philosophical understanding of science have vindicated many of John Dewey’s views on the matter. Scientific reason is not marked off from other forms of human intellectual endeavor as a sort of model of perfection that these lesser activities must always strive (unsuccessfully) to mimic. Rather, science embodies exactly the same types of fallible reasoning as is found elsewhere—it is just that scientists do, a little more self-consciously and in a more controlled way, what all effective thinkers do. As Dewey pointed out, he believed strongly that intellectual inquiry

in spite of the diverse subjects to which it applies, and the consequent diversity of its special techniques has a common structure or pattern: that this common structure is applied both in common sense and science.


Recent work has shown that scientists, like workers in other areas, are in the business of providing reasonable justifications for their assertions, but nothing they do can make these assertions absolutely safe from criticism and potential overthrow. (There are no absolute justifications, hence the somewhat misleading name sometimes given to recent epistemology—“nonjustificationist.” This is misleading because it suggests that, if there are no absolute justifications, there are no justifications at all!) It is salutary to remember that Dewey pre-

AUTHOR’S NOTE: Helpful comments have been provided by Harvey Siegel and Debby Kendeman.
tered not to use the term truth but, instead, the term warranted assentability, and he recognized that different types of assertions required different warrants. Furthermore, this change of language highlighted the fact that a warrant is not forever; today’s warrant can be rescinded tomorrow, following further inquiry.

None of this means that science is unbelievable, or that “anything goes” or “anything may be accepted,” or that “there is no justification at all for scientific claims,” or that “there are no standards by which the truth or adequacy (or both) of a piece of science can be judged.” It simply means that no longer can it be claimed there are any absolutely authoritative foundations upon which scientific knowledge is based (hence the other title often given to contemporary epistemology—“nonfoundationalistic”). The fact is that many of our beliefs are warranted by rather weighty bodies of evidence and argument, and so we are justified in holding them; but they are not absolutely unchallengeable.

This view of science fits comfortably with what every experienced action researcher and evaluator of social programs has come to understand about his or her own work: these are, on the surface, fields of the “believable,” of building the “good case,” but where even the best of cases can be challenged or reanalyzed or reinterpreted. Nothing is more suspicious in the field of evaluation than a report that is presented with the implication that it has the status of “holy writ.” Researchers in the “pure” sciences, and in the more laboratory-oriented of the social and human sciences, now have to accept that good science is a blood brother if not a sibling to what transpires in these messier and more open-ended fields of endeavor.

What happened in philosophy of science to build this new and modest view? Or, alternatively, what destroyed the older view?

An Outline of Recent Developments

The new view of science could not get off the ground until the foundations of the dominant older view, positivism, had been shown to be untenable. The role that had been ascribed to observation—that it was both the rock-bottom foundation of science and, at the same time, the final arbiter of what could be believed—was reevaluated; and the relation between scientific theories and evidence was shown to be more complex than had been thought. The related view that science grows by steady accumulation of findings and theories was challenged by the work of Thomas Kuhn and subsequent scholars such as Lakatos and Feyerabend. Obviously these matters are too complex to discuss in full, but a few of the crucial issues can be highlighted.

Observation

It is clear (to all except some mystics) that, if the aim of science is to establish bodies of knowledge about the world, then somewhere in the process of doing science the world must be studied or observed. But it has been recognized for many decades that the positivistic and operationalistic view that all theoretical terms of science must be reducible to (i.e., definable in terms of) observational language is quixotic. The status of operationalism in the behavioral sciences was a hot issue in the decade immediately following World War II, and there were international symposia on the matter. A consensus was reached (except, of course, for a few diehards—an old story): If the positivist/operationalist view were to be accepted, it would have a chilling effect on theorizing about unobservable mechanisms such as the subatomic events that have won Nobel prizes for so many physicists. Carl Hempel, a somewhat “lapsed” logical positivist, drew in his postpositivist years) the following enticing picture that makes absurd the operationalist notion that concepts can each be reduced to a set of observation statements:

Scientific systematization requires the establishment of diverse connections, by laws or theoretical principles, between different aspects of the empirical world, which are characterized by scientific concepts. Thus, the concepts of science are the knots in a network of systematic interrelationships in which laws and theoretical principles form the threads. . . . The more threads that converge upon, or issue from, a conceptual knot, the stronger will be its systematizing role, or its systematic import. (Hempel, 1966, p. 94)

Thus the point was driven home that the theoretical concepts of science have meanings that transcend definition in observational terms, and it was realized that, if this were not the case, science would have trouble in growing and extending into new areas.
The natural sciences are the "cultural constructs" that underlie our understanding of the world. These constructs are built upon a foundation of empirical evidence, which is then subjected to rigorous testing and refinement. The process of scientific inquiry is a continuous one, with new observations challenging old hypotheses and leading to the development of more accurate models of the natural world.

Over the past few decades, our understanding of the universe has expanded dramatically. For example, the discovery of black holes has revolutionized our understanding of gravity and the behavior of matter under extreme conditions. Similarly, the development of quantum mechanics has allowed us to explore the fundamentally probabilistic nature of the microscopic world.

In recent years, there has been a growing interest in the intersection between science and philosophy. This interdisciplinary field, known as science philosophy, seeks to address the fundamental questions that arise in scientific inquiry, such as the nature of reality and the limits of knowledge.

As our understanding of the natural world continues to evolve, so too must our philosophical frameworks. The challenge is to reconcile the empirical evidence with our philosophical intuitions, and to develop a coherent and comprehensive worldview that can accommodate both.

Theory and Evidence

Throughout the history of science, there have been numerous instances where new theories have been proposed based on limited evidence. In many cases, these theories have been successful in explaining a wide range of phenomena, even though they have been based on incomplete data. However, as more data becomes available, these theories are often refined or even abandoned altogether.

This highlights the importance of evidence in the scientific process. While theories may be initially supported by limited evidence, it is the accumulation of additional data that ultimately determines whether a theory is upheld or discarded. The scientific method relies on the objective testing of hypotheses, with the ultimate goal of developing a comprehensive understanding of the natural world.
The idea of a method that contains form, anchoring and absolutely binding principles for conducting the business of science goes into completely undesirable decisions when combined with the results of historical re-evaluation. The problem even under these adverse conditions has Feynman issues.

In any case, the idea is a formidable writer on this and related programs. If an attempt to gather changes made in an ongoing program; it may be best to have a hypothesis that is not validated for any reason. The plan of the book is much elaborated, by altering the obvious portion of the net, while others maintain by altering the form of the net.
Science Change

Perhaps the most famous feature of the new philosophy of science, however, is its emphasis on a new analytical approach. The process of scientific investigation and discovery involves a number of distinct stages, including observation, experiment, theory development, and data analysis. Each of these stages is characterized by specific goals and methods, and they are interdependent in the scientific process.

Questions and Answers

1. What is the new philosophy of science, and how does it differ from traditional approaches?

a. The new philosophy of science emphasizes the analytical approach, which involves a number of distinct stages: observation, experiment, theory development, and data analysis. Each stage is characterized by specific goals and methods, and they are interdependent in the scientific process.

b. The new philosophy of science differs from traditional approaches in that it focuses on the analytical approach and the interdependence of its stages.

2. What are some of the goals and methods associated with each stage of the analytical approach?

a. Observation involves collecting data through various methods, such as experiments, surveys, and historical research.

b. Experimentation involves testing hypotheses through controlled experiments to determine cause-and-effect relationships.

3. How do theory development and data analysis complement each other in the analytical approach?

a. Theory development involves the construction of models and frameworks to explain observed phenomena.

b. Data analysis involves the evaluation and interpretation of data to test the validity of theories and models.

4. What are the limitations of the analytical approach in science?

a. The limitations of the analytical approach include the difficulty of replicating experiments and the challenge of accounting for all variables.

b. The limitations also include the potential for bias in data collection and the difficulty of accounting for the influence of context on scientific findings.

5. How has the analytical approach influenced scientific practice and research?

a. The analytical approach has influenced scientific practice and research by emphasizing the importance of rigorous data collection and analysis, as well as the need for transparency and accountability in scientific communication.

b. The analytical approach has also contributed to the development of new research methods and techniques, such as statistical analysis and computational modeling.
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are constructed and shared through well-understood socialization processes. It is this shared reality that gives meaning to our actions and beliefs, shaping our perceptions and interpretations. This shared reality is not necessarily objective or universally verifiable, as our experiences and beliefs are shaped by our social contexts, cultural frameworks, and personal perspectives.

The concept of scientific method and its role in understanding the world is often discussed. The scientific method is a process for experimentation and observation that aims to discover and describe natural phenomena. It involves making observations, developing hypotheses, and testing these hypotheses through experiments. The aim is to develop a body of knowledge that is logically consistent and can be tested by others.

However, the scientific method is not without its limitations. It is based on a human interpretation of the world and is subject to the biases and limitations of our senses and cognitive processes. Furthermore, the scientific method is not a guarantee of truth, as there is always the possibility of error or the discovery of new information that may contradict existing knowledge.

In conclusion, while the scientific method provides a powerful framework for understanding the world, it is important to recognize its limitations and to be open to the possibility of revising our beliefs in light of new evidence.
is not taken by consumers as invalidating the notion of a warranty, nor is it seen as making each purchase equally wise. And the very same situation exists in science.

The Popperian account of objectivity is widely, though not universally, accepted by positivists. The following sentences capture the essence of his approach:

What may be described as scientific objectivity is based solely upon a critical tradition which, despite resistance, often makes it possible to criticize a dominant dogma. To put it another way, the objectivity of science is not a matter of the individual scientists but rather the social result of their mutual criticism, of the friendly-hostile division of labour among scientists, of their co-operation and also of their competition. For this reason, it depends, in part, upon a number of social and political circumstances which make criticism possible. (Popper, 1976, p. 95)

Conclusion

It can be seen from the foregoing discussion that postpositivism is a broad, complex, and dynamic approach to understanding the nature of science. There is little unanimity on important issues among its "adherents" (if people can be said to adhere to so amorphous a position)—but this is a healthy feature and not a weakness. Paul Feyerabend (1968, p. 33) wrote, a quarter-century ago, that unanimity of opinion may be fitting for some church, or for the followers of a tyrant, but it is most unfitting for science.

The danger to postpositivism comes not from internal dissenion but from outside—from those who draw false, and often oversimple, conclusions from some of the very same developments that have produced postpositivism itself.

Notes

1. Many of the following issues are discussed at greater length in Phillips (1979).
2. For more details on the complicated deme of positivism, see Phillips (1983).
3. A leading postpositivist antiental is Ravi RanFranzen (1980). His grounds for antirealism are not those of the logical positivists.
4. It is far from clear that the notion of paradigms as developed by Kuhn is sustainable; see the books by Phillips, Newton-Smith, and Siegel quoted elsewhere in this chapter.